# Sun Blade X6450 Server Module Service Manual

Submit comments about this document by clicking the Feedback[+] link at: http://docs.sun.com

Please
Recycle

Adobe PostScript™

# Contents

# Figures

# Tables

# Preface

This *Sun Blade X6450 Server Module Service Manual* contains information and procedures for maintaining and upgrading the Sun Blade X6450 server module.

## Before You Read This Document

It is important that you review the safety guidelines in the *Sun Blade 6000 Modular System Safety and Compliance Guide* (820-0053).

## Product Updates

For product updates that you can download for the Sun Blade X6450 server module, go to:

http://www.sun.com/servers/blades/downloads.jsp

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

# Related Documentation

All Sun hardware documentation is available at:

http://docs.sun.com

For the most up-to-date information about the Sun Blade X6450 server module, navigate to the Sun Blade X6450 server module document collection using the High-End Servers and Blade Servers product category links.

Translated versions of some of these documents might also be available after the product's world-wide release date. Select a language from the drop-down list and browse or navigate to the product name x64 document collection. Available translations for the Sun Fire servers include Simplified Chinese, Traditional Chinese, French, Japanese, and Korean.

English documentation is revised more frequently and might be more up-to-date than the translated documentation.

# Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

■ Software documentation that you received with your system

■ Solaris™ operating system documentation, available at:

http://docs.sun.com

# Typographic Conventions

| Typeface[*] | Meaning | Examples |
|---|---|---|
| AaBbCc123 | The names of commands, files, and directories; on-screen computer output | Edit your `.login` file.<br>Use `ls -a` to list all files.<br>`% You have mail.` |
| **AaBbCc123** | What you type, when contrasted with on-screen computer output | `% `**`su`**<br>`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*.<br>These are called *class* options.<br>You *must* be superuser to do this.<br>To delete a file, type `rm` *filename*. |

\* The settings on your browser might differ from these settings.

# Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

# Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

http://www.sun.com/hwdocs/feedback

Please include this title and document part number with your feedback:

*Sun Blade X6450 Server Module Service Manual*, 820-3539-13

# Introduction to the Sun Blade X6450 Server Module

This chapter provides an overview of the Sun Blade X6450 server module, and contains the following sections:

# 1.1 Features of the Servers

The Sun Blade X6450 server module is designed to fit into the Sun Blade 6000 and Sun Blade 6048 chassis systems. TABLE 1-1 summarizes the features of the server module.

**TABLE 1-1** Summary of Features

| Feature or Component | Specifications |
|---|---|
| CPU | Up to four Intel Xeon 7000 series quad-core processors |
| Memory | Up to 24 FB DIMMs blade (up to 6 per Channel) |
| Service Processor (SP) | • Onboard IPMI 2.0 compliant SP<br>• One 10/100 management Ethernet port to midplane<br>• Remote keyboard, video, mouse, and storage (RKVMS) over IP<br>• See Section 1.2, "Service Processor" on page 1-3 for more information |
| Midplane I/O | • Two x8 PCI-Express (PCIe) lanes<br>• Two x2 SAS Links (to on-board REM connector)<br>• Two 10/100/1000 Base-T GigabitEthernet<br>• One 10/100 Base-T Ethernet<br>• 12C Bus<br>• Two x4 PCIe Lanes (can also be configured as two XAUI interfaces when used with FEM) |
| Module Support | • Sun Blade RAID 5 Expansion Module<br>• Sun Blade RAID 0/1 Expansion Module<br>• Sun Blade 10 GigabitEthernet Multi-Fabric Network Express Module<br>• Sun Blade 6000 10GbE Multi-Fabric Network Express Module<br>• Power support for two PCIe ExpressModules (EM)<br>• Network expansion module (NEM) |
| Front Panel I/O | Universal Connector Port (UCP) for use with the multi-port dongle cable, which provides the following interface connections[*]:<br>• VGA graphics<br>• Serial console to SP<br>• Dual USB ports (keyboard/mouse) |
| Compact Flash | On-board IDE compact flash module interface |

[*] There are two versions of the multi-port dongle cable (see Section 1.5, "Using the Multi-Port Dongle Cable for Testing" on page 1-9).

# 1.2 Service Processor

The SP's built-in system management software enables you to monitor and manage the components installed in your chassis and server modules. Using the SP, you can configure network information, view and edit hardware configurations, monitor vital system information, and manage user accounts.

The chassis has its own service processor, called a Chassis Monitoring Module Integrated Lights Out Manager (CMM ILOM). In addition to providing chassis management functions, it provides an Ethernet connection to the server module's SP. This allows you to view and configure the server module's network information using the CMM ILOM.

The service processor operates when the server module is powered on, or in standby power mode.

Your server module might be equipped with one of several versions of the SP:

■ ILOM 3.0 – This is the newest version of the service processor software.

For additional documentation, see the ILOM 3.0 documentation collection and the *Integrated Lights Out Manager 3.0 Supplement for Sun Blade X6450 Server Module*.

■ ILOM 2.0 – This version of the service processor software is also described in this section.

For additional documentation, see the ILOM 2.0 documentation collection and the *Integrated Lights Out Manager 2.0 Supplement for Sun Blade X6450 Server Module*.

■ ELOM – Older systems might be equipped with an ELOM.

For additional documentation, see the ELOM documentation collection.

## 1.3 Sun Blade X6450 Server Module Overview

This section contains illustrations that you can use to become familiar with the components of the Sun Blade X6450 Server Module.

### 1.3.1 Server Module Front Panel

FIGURE 1-1 shows the LEDs and buttons on the front panel. Each LED has one or more activity states. The activity depends upon whether the server module is ELOM-based or ILOM-based. For a description of the LED activities, see TABLE 3-1 in Section 3.1.1, "Monitoring System Components Using the External Service Action Required Indicator LED" on page 3-2.

**FIGURE 1-1**   Server Module Front Panel
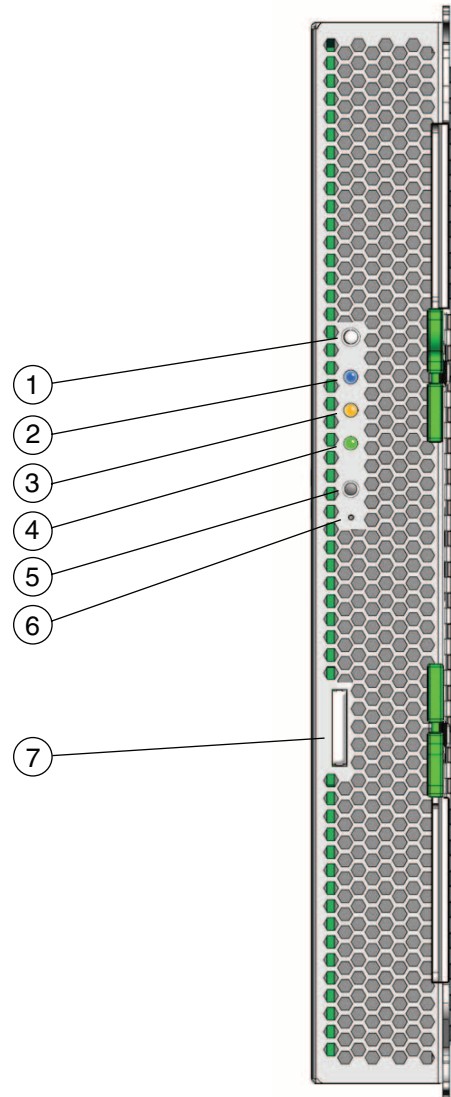


**Figure Legend**

| | |
|---|---|
| **1** | White Locate LED button |
| **2** | Blue Ready to Remove LED |
| **3** | Amber Service Action Required LED |
| **4** | Green OK LED |

## 1.3.2    Server Module Components

FIGURE 1-2 shows the server module with the top cover removed and the location of the replaceable components.

**FIGURE 1-2**    Server Module Replaceable Component Locations
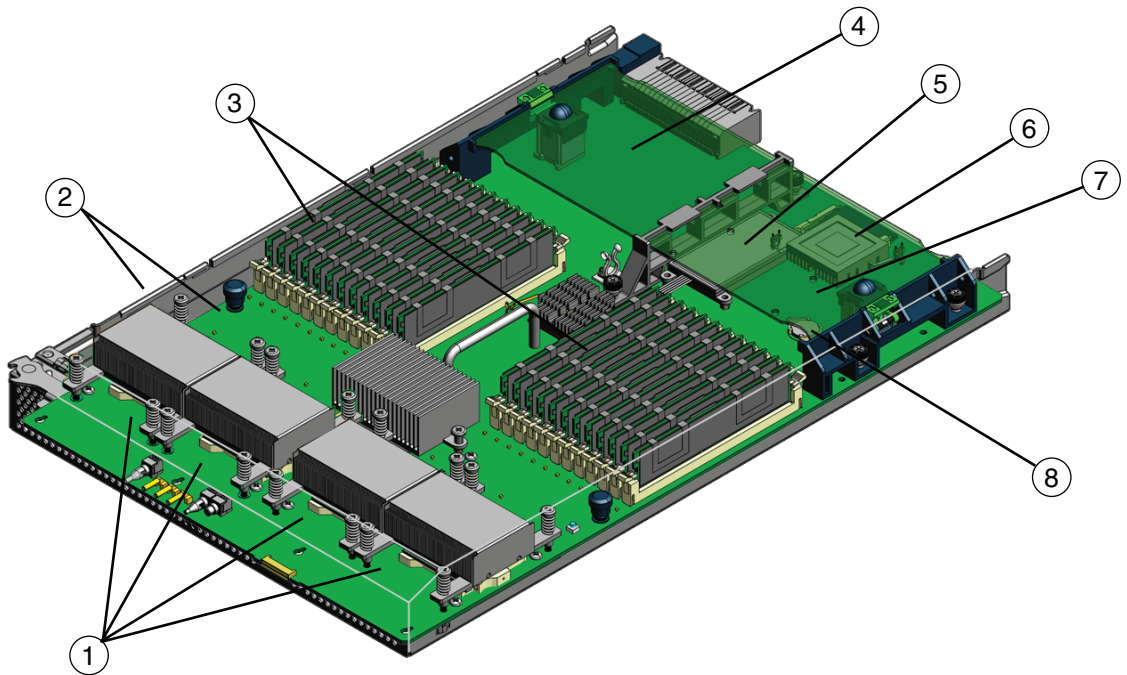


**Figure Legend**

| | |
|---|---|
| **1** | Heaksink and CPU assemblies (4) |
| **2** | Motherboard and chassis assembly |
| **3** | DIMMs (24 in 2 Banks of 12 Each) |
| **4** | Fabric expansion module (Optional) |
| **5** | Battery for optional RAID expansion module, or solid-state drive (SSD) |

| | |
|---|---|
| **6** | Compact flash card |
| **7** | RAID expansion module (Optional) |
| **8** | CR2032 battery for RTC |

# 1.4 Identifying Sun Blade X6450 Server Module Revisions

The Sun Blade X6450 server module has two motherboard (MB) revisions (revision 1 and revision 2). Some optional hardware components, such as a SSD and low voltage DIMMs, work with revision 2 MB only, and some procedures in this manual are specific to revision 2 motherboards. Before performing a revision 2 specific procedure, or installing optional components, you need to determine the revision of your server module. This section describes how to identify your server module's MB revision.

You have the following options for determining the revision level of your server module:

- Physically check the MB
- Use ELOM or ILOM (web interface or CLI)

## ▼ To Identify MB Revision Using a Hardware Check

1. **Power off the server module, and remove the server module from the chassis (see** "To Remove the Server Module From the Chassis" on page 3-13**).**

⚠ **Caution –** Possible chassis shutdown. Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

**3. Read the FRU part number on the FRU label affixed to the motherboard. See FIGURE 1-2 for the location of the FRU label.**

The revision 2 FRU part number is F540-7821-*xx*.
where *xx* is irrelevant version information.

**FIGURE 1-3**   The Location of the FRU ID Label
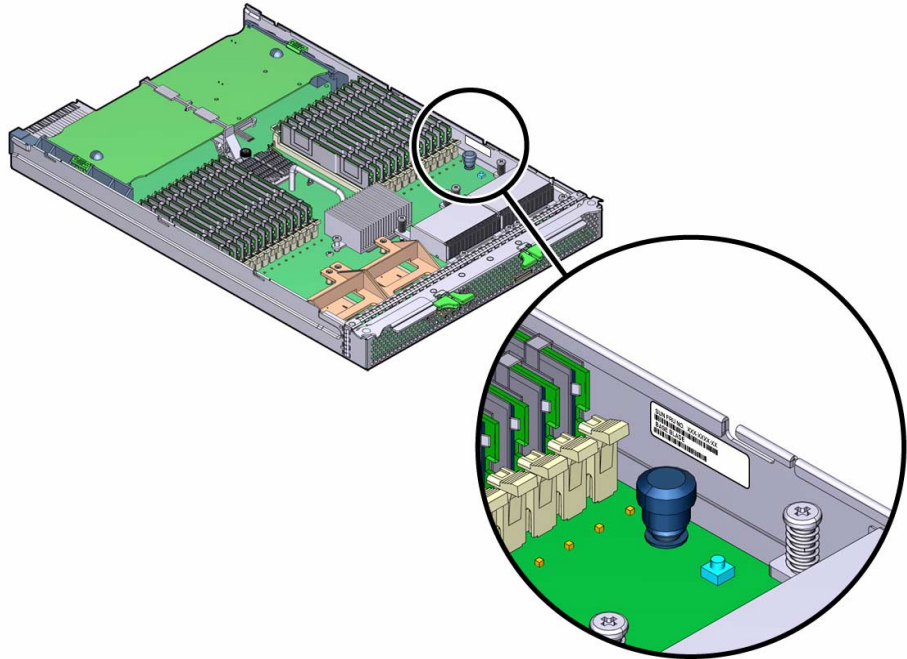


## ▼ To Identify MB Revision Using the ELOM or ILOM Web Interface or CLI

● **Log in to either the ELOM or ILOM web interface or CLI. See the corresponding ILOM documentation for more information.**

The revision 2 FRU part number is F540-7821-*xx*.
where *xx* is irrelevant version information.

## 1.5 Using the Multi-Port Dongle Cable for Testing

Your chassis ships with a multi-port dongle cable as well as a DB9-to-RJ45 serial adapter cable. The multi-port cable enables you to plug devices directly into the front of the server for maintenance and OS installation purposes. The multi-port cable provides connections for a VGA monitor, two USB devices, and an RJ45 device (see FIGURE 1-4). The DB9-to-RJ45 serial adapter cable provides DB9 serial access to the server module through an RJ45 connection.

---

**Note –** There are two versions of the multi-port dongle cable. Your cable might have three cables, or it might have four cables. If your multi-port cable has three cables, connect to the serial port using the RJ45 connector (use the DB9-to-RJ45 adapter cable, if necessary). If your multi-port cable has four cables, connect to the serial port using the DB9 connector, and do *not* use the RJ45 connector.

---

## ▼ To Use a Multi-Port Dongle Cable for Testing

1. **Insert the multi-port dongle cable into the universal connector port (UCP) on the server module front panel. See** FIGURE 1-1**.**

2. **Connect the multi-port dongle cable connections as appropriate.**

**FIGURE 1-4**  Dongle Cable Connections
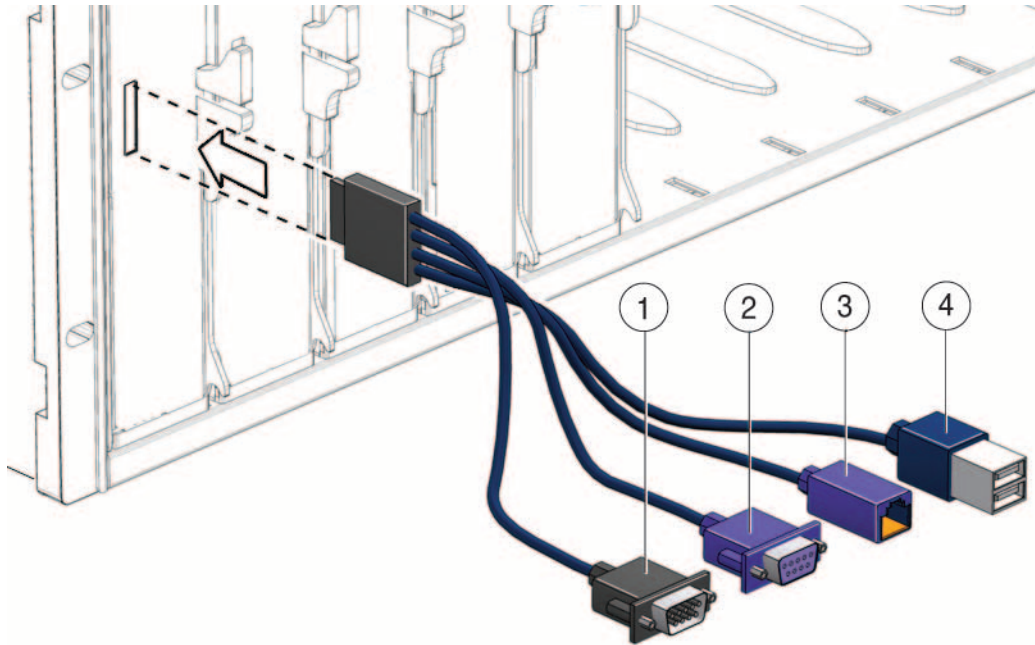


**Figure Legend**

| | |
|---|---|
| **1** | DB-9 serial connector |
| **2** | VGA video connector**.** Note: this connector is not present on a three-connector dongle |
| **3** | RJ-45 connector.<br>- On a three-connector dongle, this connector provides serial access to the service processor.<br>- On a four-connector dongle, this connector is unused. |
| **4** | Dual USB connectors |

⚠️ **Caution –** Disconnect the multi-port dongle cable when you are finished using the cable. Otherwise, the cable, blade, or chassis could be damaged when the chassis door is closed or the cable abruptly pulled.

## 1.6 Accessory Kits

TABLE 1-2 lists the contents of the accessory kit that is shipped with the servers.

**TABLE 1-2** Accessory Kit

| Item | Part Number |
|---|---|
| *Sun Blade X6450 Server Module Tools and Drivers CD* | 707-0198-10 |
| *Sun Blade X6450 Server Module Installation Guide* (printed documentation) | 820-3535 |
| *Where to Find Sun Blade X6450 Server Module Documentation* (printed sheet) | 820-3542 |
| Additional safety and license documentation | |

## 1.7 Additional Options and Replaceable Components

Supported components and their part numbers are subject to change over time. For the most up-to-date list, go to:

http://sunsolve.sun.com/handbook_pub/Systems/

Click the name and model of your server. On the product page that opens for the server, click on `Full Components List` for a list of components.

**Note –** These servers are fully compliant with the Reduction of Hazardous Substances (RoHS) Directive.

## 1.8 Customer Replaceable Units (CRUs) and Field Replaceable Units (FRUs)

Customer Replaceable Units (CRUs) are designed to be replaced by customers. Field Replaceable Units (FRUs) must be replaced by Sun service personnel.

**Caution –** Changing FRUs can damage your equipment and void your warranty.

TABLE 1-3 lists the CRUs and FRUs.

**TABLE 1-3** CRU and FRU List

| Part | CRU or FRU |
|---|---|
| Base Blade, includes motherboard, battery, and cables (no CPU and no memory) | FRU |
| **CPUs** | |
| Dual-Core Intel Xeon E7220 CPU (2.93 GHz, 1066 MHz, 80 W) | FRU |
| Quad-Core Intel Xeon L7345 CPU (1.86 GHz, 1066 MHz, 50 W) | FRU |
| Quad-Core Intel Xeon E7320 CPU (2.13 GHz, 1066 MHz, 80 W) | FRU |
| Quad-Core Intel Xeon E7340 CPU (2.40 GHz, 1066 MHz, 80 W) | FRU |
| Quad-Core Intel Xeon L7440 CPU (2.40 GHz, 1066 MHz, 90 W) | FRU |
| Six-core Intel Xeon L7445 CPU (2.40 GHz, 1066 MHz, 65 W) | FRU |
| Six-core Intel Xeon L7450 CPU (2.40 GHz, 1066 MHz, 90 W) | FRU |
| **DIMMs** | |
| 4 GB (2 GB DIMM X 2) PC2-5300 DDR2 fully buffered memory kit | CRU |
| 8 GB (4 GB DIMM X 2) PC2-5300 DDR2 fully buffered memory kit | CRU |
| 16 GB (8 GB DIMM X 2) PC2-5300 DDR2 fully buffered memory kit | CRU |
| **Boot and Storage** | |
| 16 GB compact flash | CRU |
| 32 GB compact flash | CRU |
| Solid State Drive (32 GB 2.5" SATA2) | FRU |
| **Modules** | |
| Sun Blade RAID 5 Expansion Module (with or without battery) | CRU |
| Sun Blade RAID 5 Expansion Module Battery | CRU |
| Sun Blade RAID Expansion Module | CRU |
| Sun Blade 10 GigabitEthernet Multi-Fabric Expansion Module | CRU |
| **Miscellaneous** | |
| CR2032 battery | CRU |
| Cable kit | CRU |

# Powering On the Server Module, Configuring BIOS and Resetting BIOS, SP and CMOS

This chapter contains information about powering the server on and off, configuring the BIOS, resetting the BMC and BIOS passwords, clearing the CMOS password and updating firmware. Information about the (power-on self-test) POST and POST codes is also included.

The information is contained in the following sections:

## 2.1 Powering On the Server Module

This section contains procedures for powering on the server module.

**Note –** Before powering on your server for the first time, follow the installation instructions provided in the *Sun Blade X6450 Modular Server Installation Guide*, (820-1182.)

**Caution –** Severe damage to server components can occur if the server is operated without adequate cooling mechanisms. Do not operate the server without all component heatsinks, air baffles, and covers installed.

## ▼ To Power On the Server Module

1. **When you insert your server module into a chassis that is powered on, it comes up to standby power mode.**

   When the server module is in standby power mode, the green Power/OK LED on the front panel blinks, indicating that the service processor (SP) is working and the system is ready to be fully powered on to main power mode. See FIGURE 2-1 for the LED location.

   **Note –** See your chassis documentation for information about powering on the chassis.

2. **Use a non-conducting pointed object, such as a stylus to press and release the recessed Power button on the server front panel.** See FIGURE 2-1 for the Power button location.

   When main power is applied to the full server, the green Power/OK LED next to the Power button lights and remains lit.

   FIGURE 2-1 shows the location of the power button.

   **You can also use the SP to turn on main power.**

   - From the the ILOM or ELOM CLI, enter **start /SYS**.
   - From the ILOM or ELOM web interface, use the Remote Power Control screen. See the corresponding SP documentation for details.

**FIGURE 2-1**   Power Button and Power/OK LED Location
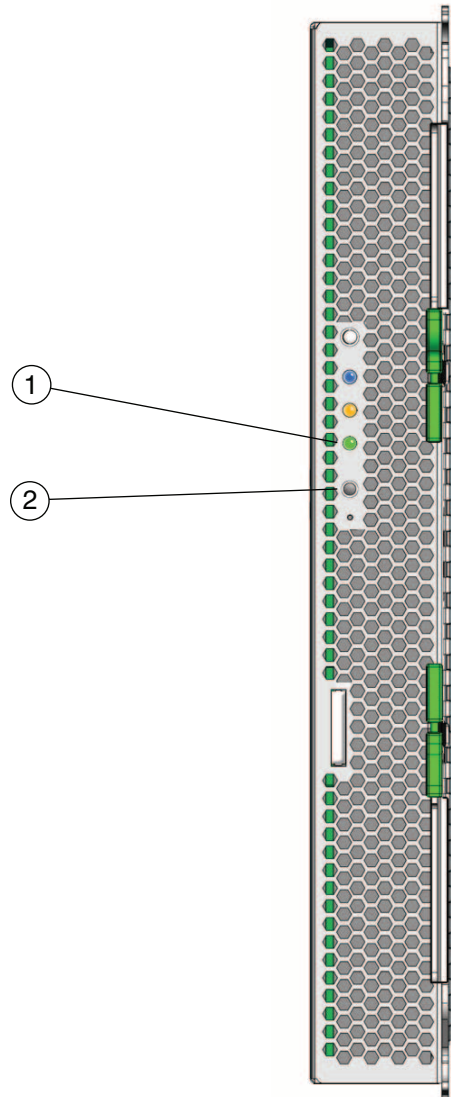


**Figure Legend**

| | |
|---|---|
| **1** | Green OK LED |
| **2** | Power on/standby button |

## 2.2 Powering Off the Server

You can use one of the methods for shutting down the server from main power mode to standby power mode.

1. **Graceful shutdown**: Use a non-conducting pointed object, such as a stylus to press and release the Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately.

2. **Emergency shutdown**: Press and hold the Power button for four seconds to force main power off and enter standby power mode.

3. **ELOM or ILOM web interface**: Log in to the web interface and use the Remote Power Control screen to perform a graceful power off of the server.

4. **ELOM or ILOM command-line interface (CLI)**: Log in to the ELOM or ILOM CLI and use the following command:

   −> **stop /SYS**

   For more information about controlling server power from the web interface or CLI, see the corresponding SP documentation collection.

5. To completely power off the server, you must eject it from the chassis power connector or remove power from the chassis. See "To Remove the Server Module From the Chassis" on page 3-13 or your chassis documentation for details.

---

**Note –** When you use the Power button to enter standby power mode, the system continues to supply power to the SP and the power supply fans, and the Power/OK LED blinks.

---

When main power is off, the Power/OK LED on the front panel blinks, indicating that the server is in standby power mode.

## 2.3     Configuring BIOS Settings

This section describes how to use the BIOS Setup Utility to view and modify the
BIOS settings. The BIOS Setup Utility is stored in the BIOS memory. You access the
BIOS Setup Utility by rebooting the server, watching the POST messages, and
pressing F2 when prompted.

### 2.3.1      Viewing the BIOS Setup Utility

You can view the BIOS Setup Utility and configure the BIOS using several different
interfaces:

- Attach the multi-port dongle cable to the UCP connector on the front of the server,
  and attach a USB keyboard and mouse to the USB connectors, and a VGA monitor
  to the video connector on the multi-port dongle cable (see Section 1.5, "Using the
  Multi-Port Dongle Cable for Testing" on page 1-9).

- Use the remote video console of the SP ELOM or ILOM and redirect the server's
  console output. See the corresponding SP documentation collection for more
  information.

- Use a terminal (or a computer running terminal emulation software) through the
  serial port on the server dongle. See the corresponding SP documentation
  collection for more information.

### 2.3.2      Configuring the BIOS

The configured data is provided with context-sensitive Help. The data is stored in the
system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM
is invalid, the BIOS settings will default to optimal values.

To navigate the BIOS Setup Utility, use the left and right arrow keys to move
sequentially back and forth through the screens. Fields that you can configure are
highlighted or appear in color. Use the keyboard up and down arrow keys to scroll
through a screen's submenu. Use the Tab key to move back and forth across columns.

## ▼ To Configure the BIOS

1. **Reboot the server, watch the display as the POST messages appear, and when prompted, press F2 to enter the BIOS Setup Utility.**

   The main BIOS Setup menu screen appears.

   POST testing is indicated when the Power/OK LEDs on the front and back panels go into slow-blink mode.

2. **Highlight the field to be modified using the arrow keys and Tab key.**

3. **Press Enter to select the field.**

   A dialog box appears. The dialog box presents you with the options available for the setup field that you have chosen.

4. **Modify the setup field and close the screen.**

5. **If you need to modify other setup parameters, use the arrow keys and Tab key to navigate to the desired screen and menu item, then repeat Steps 1 through 4. Otherwise, go to Step 6.**

6. **Press and release the right arrow key until the Exit menu screen appears.**

7. **Follow the instructions on the Exit menu screen to save your changes and exit the Setup utility.**

## 2.3.3 BIOS Considerations

This section contains information and considerations regarding the system BIOS.

### 2.3.3.1 PCIe ExpressModule Slot Booting Priority

The slots for the PCIe ExpressModules are detected by the BIOS during startup in this order:

1. PCI EM BLx.1

2. PCI EM BLx.0.

For example, if the server module is in slot 3, the BIOS boot priority will be 3.1, 3.0.

### 2.3.3.2    Ethernet Port Device and Driver Naming

The Sun Blade X6450 server modules have up to two 10/100/1000BASE-T Gigabit
Ethernet ports provided by the NEMs installed in the Sun Blade 6000 or 6048 chassis.
The lower NEM port provides NET 0 and the upper NEM port provides NET 1. The
numbers correspond to the slot number, as shown in FIGURE 2-2 (*N* represents the slot
number).

**FIGURE 2-2**    Ethernet Port Chassis Labeling Designations
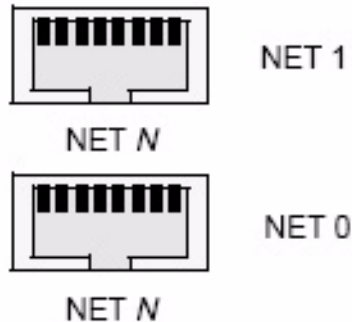


*Server Module NIC Naming*

TABLE 2-1 shows how various operating systems and interfaces name the NICs shown
in FIGURE 2-2.

**TABLE 2-1**    Server Module NIC Naming

| BIOS | Solaris 10 | Red Hat Linux | SUSE Linux | Windows |
|------|-----------|---------------|------------|---------|
| slot 800A | e1000 g1 | eth 1 | eth 1 | net 2 |
| slot 000A | e1000 g0 | eth 0 | eth 0 | net |

### 2.3.3.3    Ethernet Port (NIC) Booting Priority

The order in which the BIOS detects the Ethernet ports during boot, and the
corresponding drivers that control those ports are listed below:

1. NET 0 (INTEL NIC 0)
2. NET 1 (INTEL NIC 1)

### 2.3.3.4 BIOS Option ROM Size Limitation

The BIOS Option ROM is 128 KB. Of these 128 KB, approximately 80 KB are used by the VGA controller, and the network interface card. Approximately 48 KB remain for the Option ROM.

### 2.3.3.5 Descriptions of the BIOS Setup Screens

**Note –** Throughout this manual the terms BMC and SP are used interchangeably. The two terms are essentially the same and refer to the service processor.

TABLE 2-2 provides summary descriptions of the seven top-level BIOS setup screens.

**TABLE 2-2**   BIOS Setup Screens Summary

| Screen | Description |
| --- | --- |
| Main | View general system information and set date and time. |
| Advanced | Contains the configuration interface for the CPUs, memory, IDE, SuperIO, trusted computing, USB, PCI, MPS, and event log. |
| Boot | Contains the configuration for the boot device priority (CD/DVD, CF card, and network drives). |
| Server | Configure LAN and remote access, and reset the BMC password. |
| Security | Install or change the supervisor passwords. |
| Exit | Save or discard changes and load defaults. |

FIGURE 2-3 summarizes the BIOS Configuration Utility menu tree. See Section 2.3.4, "BIOS Setup Menu Screens" on page 2-10 for examples of each of these screens.

**FIGURE 2-3**    Server Module BIOS Configuration Utility Menu Tree
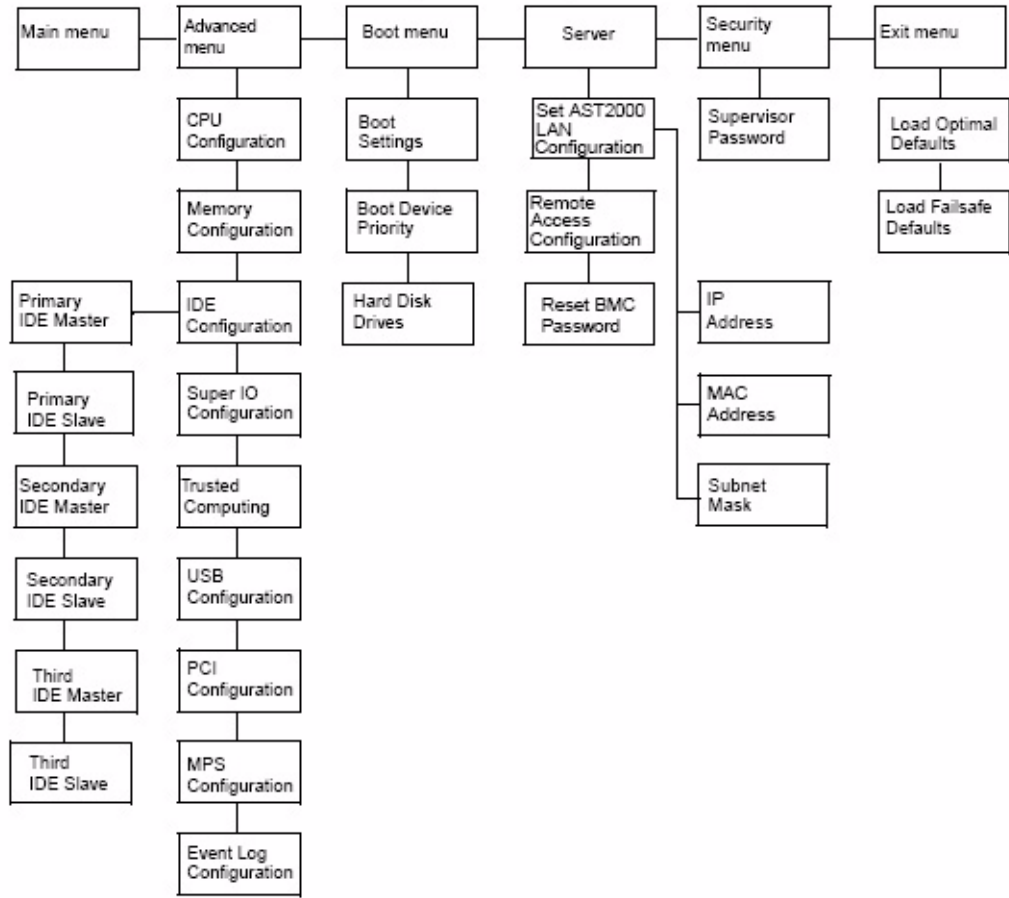
## 2.3.4 BIOS Setup Menu Screens

The following figures show sample BIOS setup menu screens. The screens shown are examples. The version numbers and the screen items and selections shown are subject to change over the life of the product.

### 2.3.4.1 BIOS Main Menu Screen

The System Overview is the first screen that appears when you enter the BIOS Setup Utility. On this screen you can set the System Time and the System Date, and you can view server-specific BIOS and CPU information (see FIGURE 2-4).

**FIGURE 2-4**   BIOS Setup Menu Main Screen
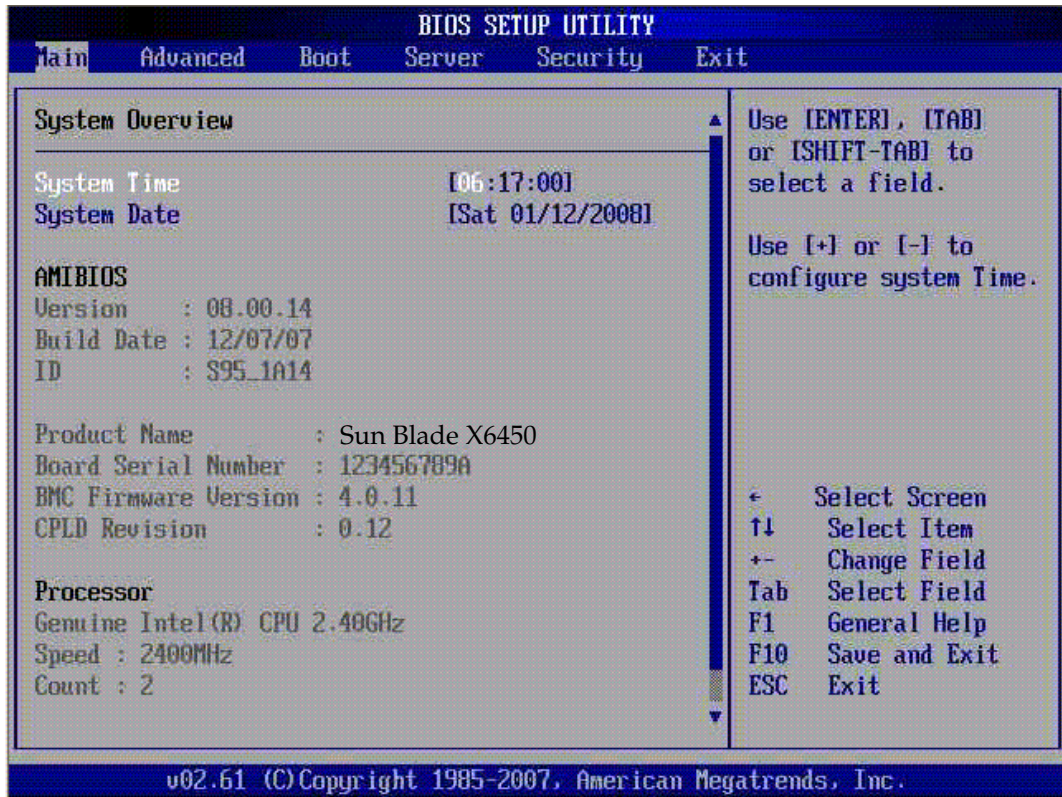
## 2.3.4.2 Advanced Settings

The Advanced Settings screen allows you to configure CPU, Memory, IDE, Super I/O, Trusted Computing, USB, PCI, MPS and Event Log settings (see FIGURE 2-5).

**FIGURE 2-5** BIOS Setup Menu Advanced Screen
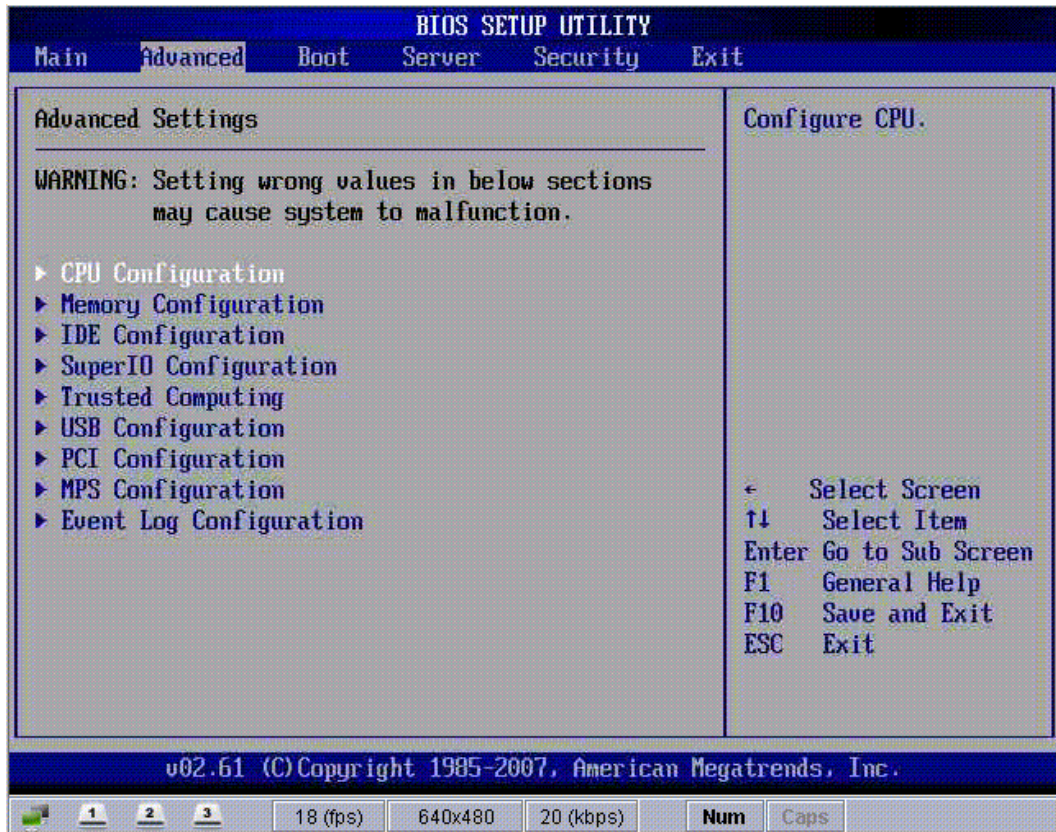
## 2.3.4.3    CPU Configuration

The Advanced/CPU Configuration screen allows you to view CPU-specific information and enable and disable various CPU functions (see FIGURE 2-6).

**FIGURE 2-6**    BIOS Setup Menu Advanced Configure CPU Screen

```
                          BIOS SETUP UTILITY
        Advanced

 Configure advanced CPU settings                    This should be enabled
                                                     in order to enable or
 Genuine Intel(R) CPU 2.40GHz                        disable the Hardware
 CPUID       :6FB                                    Prefetcher Disable
 Stepping    :G-0                                    Feature.
 Frequency   :2.40GHz
 FSB Speed   :1066MHz
 Cache L1    :128 KB
 Cache L2    :6144 KB
 Ratio Status:Unlocked (Min:06, Max:09)
 Ratio Actual Value:9


 Hardware Prefetcher          [Enabled]         ←     Select Screen
 Adjacent Cache Line Prefetch [Enabled]         ↑↓    Select Item
 Intel(R) Virtualization Tech [Enabled]         +-    Change Option
 Execute-Disable Bit Capability [Enabled]       F1    General Help
 Core Multi-Processing        [Enabled]         F10   Save and Exit
 Intel(R) SpeedStep(tm) tech  [Disabled]        ESC   Exit



        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.

         1    2    3     18 (fps)   640x480   16 (kbps)   Num   Caps
```

## 2.3.4.4 Memory Configuration

The Memory Configuration screen allows you to configure system memory settings (see FIGURE 2-7).

**FIGURE 2-7** BIOS Setup Menu Advanced Memory Screen
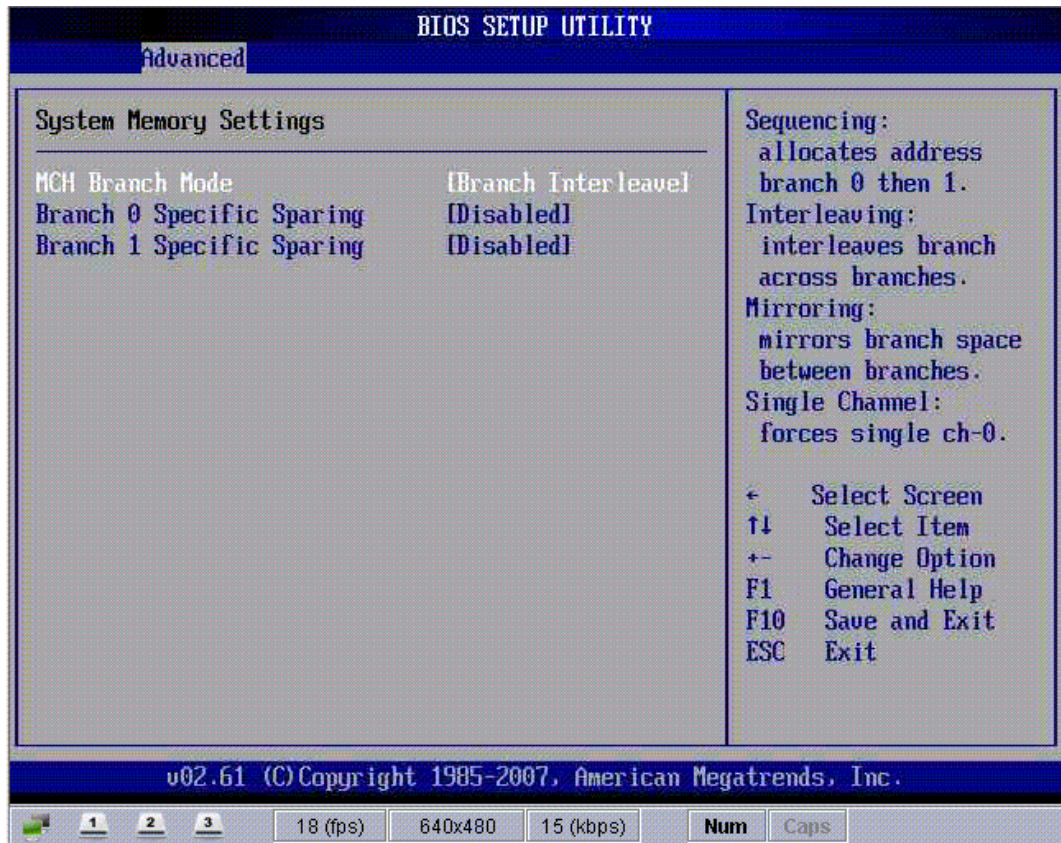
## 2.3.4.5     IDE Configuration

The IDE Configuration screen allows you to change the system's IDE settings (see FIGURE 2-8). Changes made on this screen take effect on the next boot.

**FIGURE 2-8**    BIOS Setup Menu Advanced IDE Configuration Screen
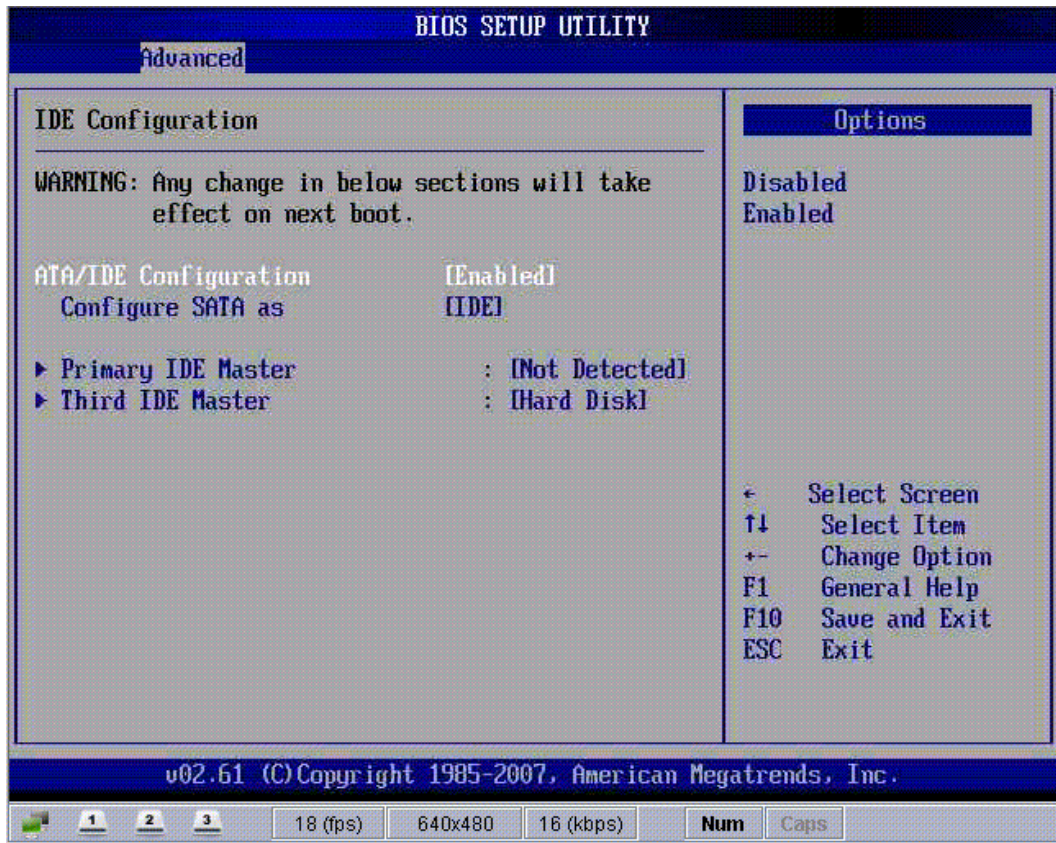
## 2.3.4.6    Super I/O

The Super I/O screen allows you to configure the Super I/O chipset. Use this screen to specify the address of serial port 1 and serial port 2 (see FIGURE 2-9).

**FIGURE 2-9**    BIOS Setup Menu Advanced Super I/O Screen
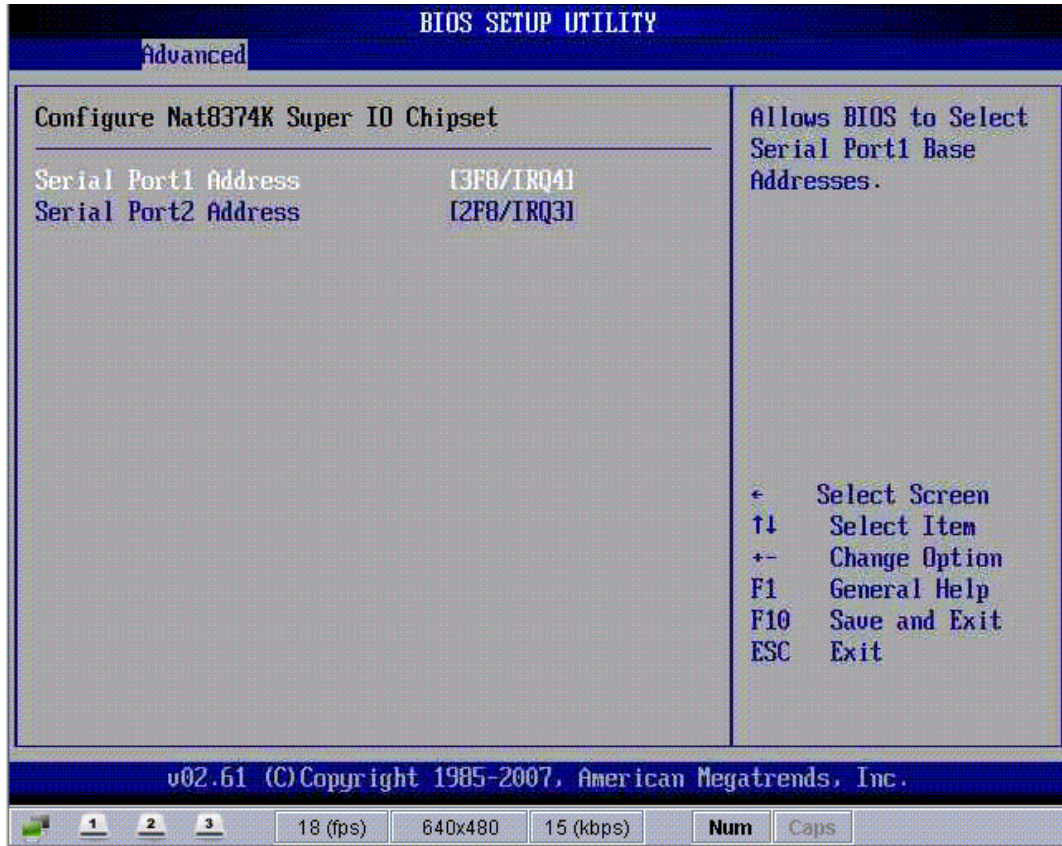
## 2.3.4.7 Trusted Computing

The Trusted Computing screen allows you to enable and configure TCG and TPM support (see FIGURE 2-10).

**FIGURE 2-10** BIOS Setup Menu Advanced Trusted Computing Screen



```
                        BIOS SETUP UTILITY
    Advanced

 Trusted Computing                                  Enable/Disable TPM
 _____      TCG (TPM 1.1/1.2) supp
                                                     in BIOS
 TCG/TPM SUPPORT                 [Yes]

 Execute TPM Command             [Don't change]
   TPM Enable/Disable Status     [Disabled]
   TPM Owner Status              [UnOwned]




                                                  ←      Select Screen
                                                  ↑↓     Select Item
                                                  +-     Change Option
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit




         v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
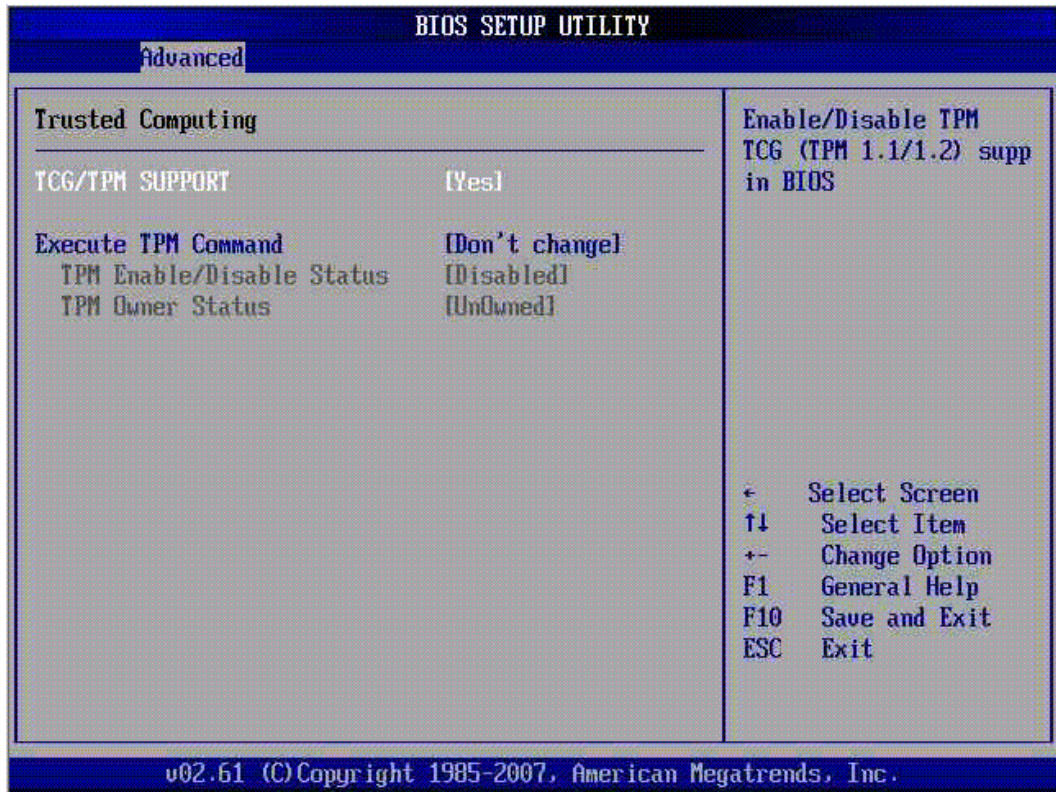
## 2.3.4.8 USB Configuration

The USB Configuration screen allows you to view USB module version information and enable and configure USB devices (see FIGURE 2-11).

**FIGURE 2-11**  BIOS Setup Menu Advanced USB Configuration Screen
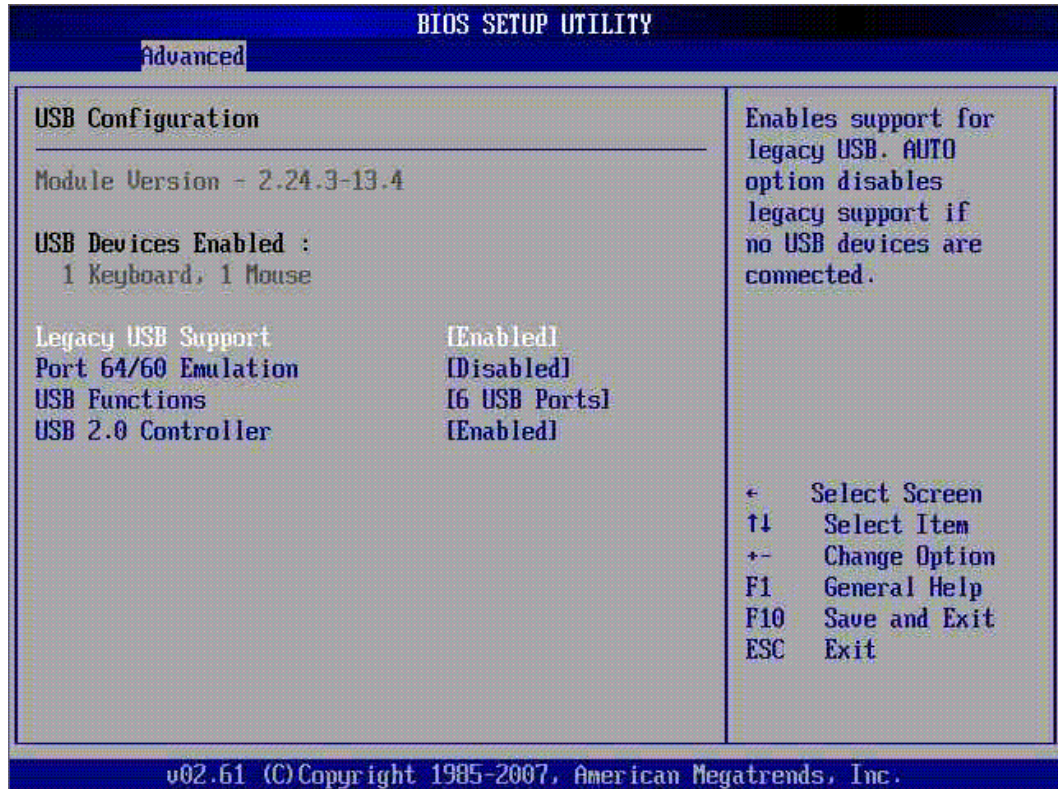
## 2.3.4.9    PCI Configuration

The PCI Configuration screen allows you to enable and disable the server's LAN and Ethernet controllers (see FIGURE 2-12).

**FIGURE 2-12**  BIOS Setup Menu Advanced PCI Configuration Screen



```
                         BIOS SETUP UTILITY
   Advanced

  PCI Configuration                                        Options

  LAN Controller 0           [Enabled]        Disabled
  LAN Controller 1           [Enabled]        Enabled

  Ethernet IOAT              [Disabled]




                                              ←      Select Screen
                                              ↑↓     Select Item
                                              +-     Change Option
                                              F1     General Help
                                              F10    Save and Exit
                                              ESC    Exit



        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
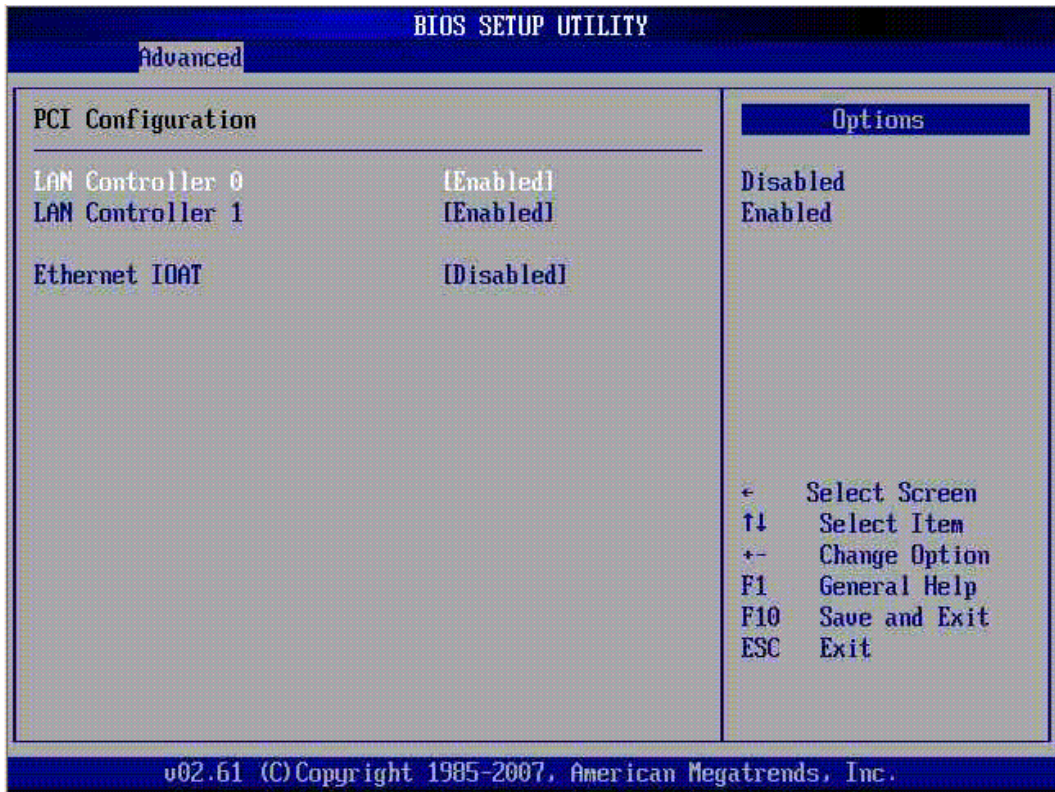
## 2.3.4.10 MPS Configuration

The MPS Configuration screen allows you to select the MPS revision (see FIGURE 2-13).

**FIGURE 2-13** BIOS Setup Menu Advanced MPS Configuration Screen



```
                        BIOS SETUP UTILITY
  Advanced

  MPS Configuration                                Select MPS
 ─────────────────────────────────────────        Revision.
  MPS Revision                      [1.4]




                                                  ←      Select Screen
                                                  ↑↓     Select Item
                                                  +-     Change Option
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit


        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
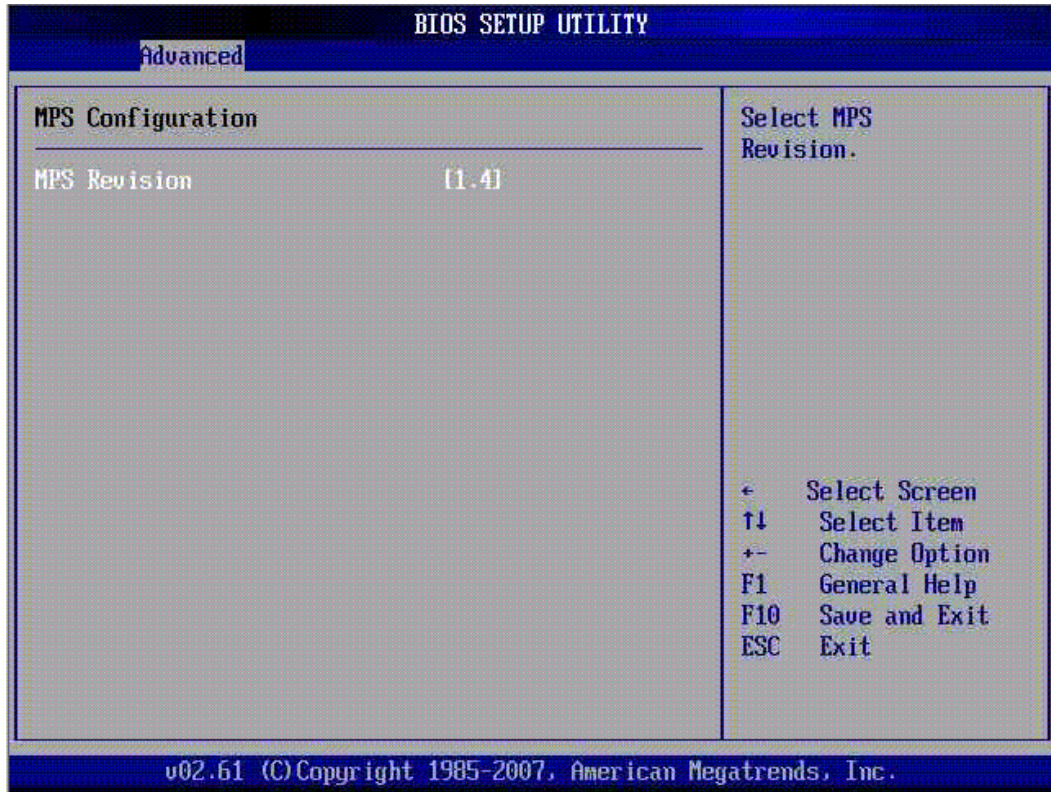
## 2.3.4.11 Event Log Configuration

The Event Log Configuration screen allows you to view and clear the event log. You can also manage the log by marking messages (see FIGURE 2-14).

**FIGURE 2-14** BIOS Setup Menu Advanced Event Logging Screen



```
                              BIOS SETUP UTILITY
      Advanced

 Event Logging details                          View all unread events
 ──────────────────────────────────────         on the Event Log.
 View Event Log
 Mark all events as read
 Clear Event Log




                                                  ←      Select Screen
                                                  ↑↓     Select Item
                                                  Enter  Go to Sub Screen
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit



            v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
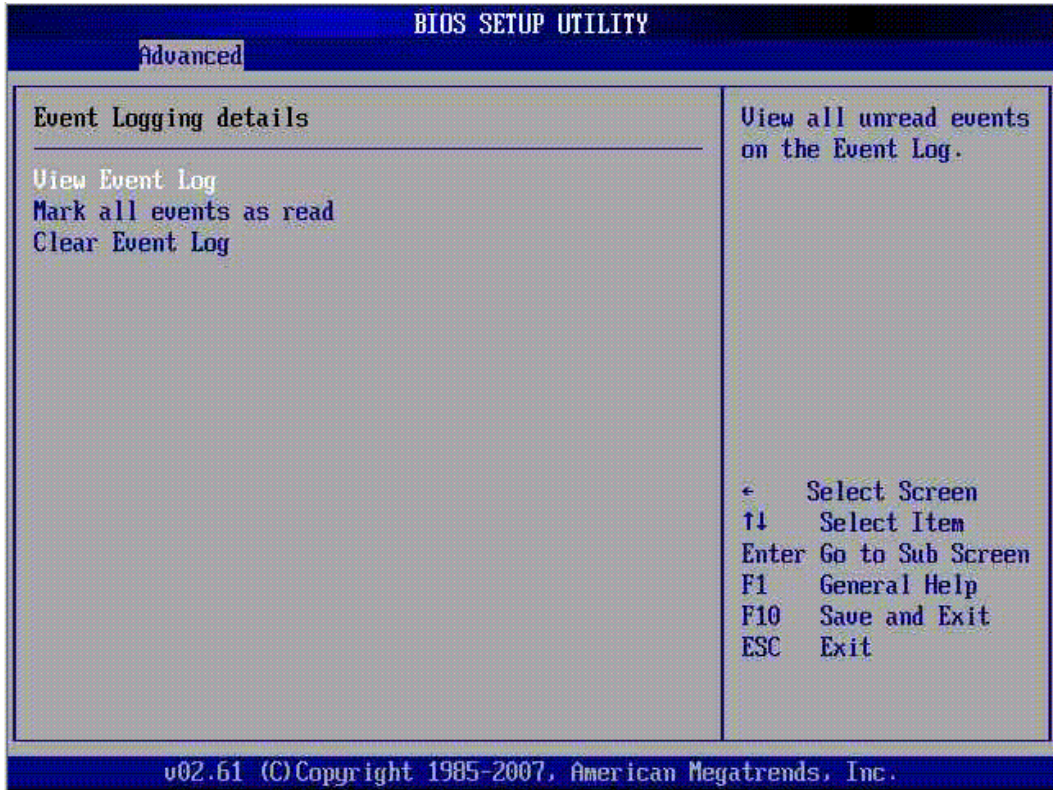
## 2.3.4.12 Boot Menu

The Boot Menu allows you to access the Boot Settings submenu screens. The Boot Settings submenu screens allow you to configure system boot settings, boot device priority, and hard drives or the compact flash card (see FIGURE 2-15).

**FIGURE 2-15** BIOS Setup Menu Boot Screen
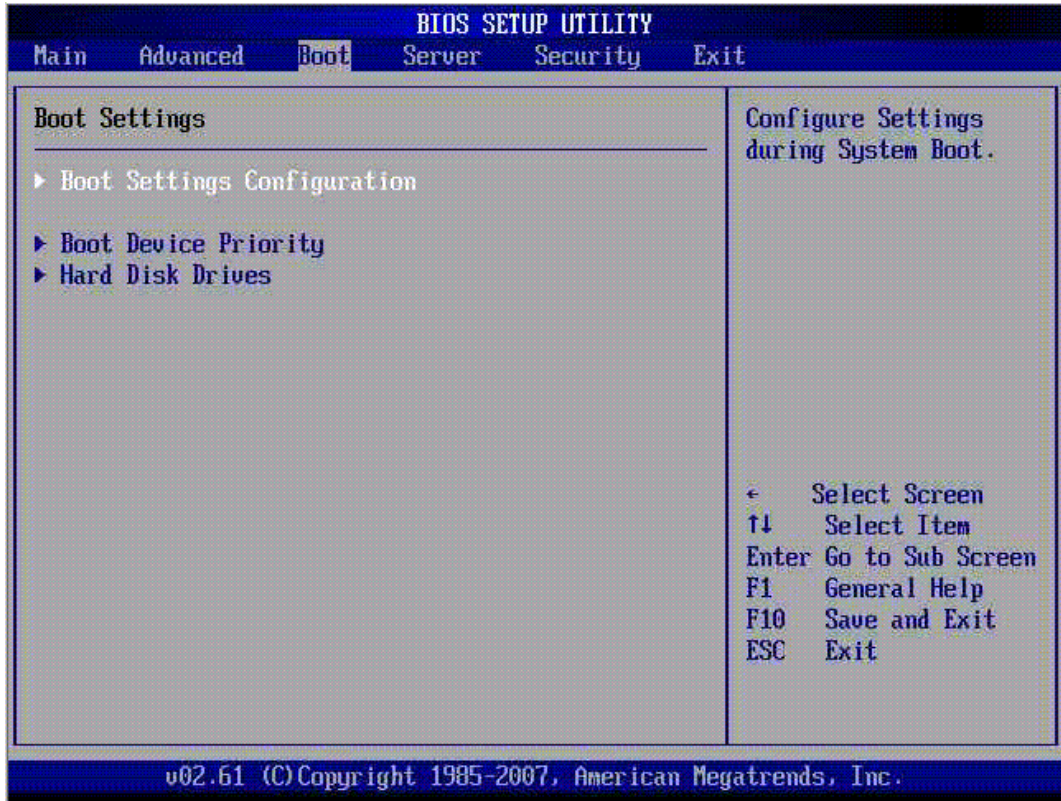
## 2.3.4.13 Boot Settings Configuration

This submenu screen allows you to configure various boot settings, including quick or quiet boot, message display, and enable or disable PCIe ExpressModule (EM) functions (see FIGURE 2-16). For more information about the options presented in this screen, see Section B.4, "Changing POST Options" on page B-3.

**FIGURE 2-16** BIOS Setup Menu Boot Configuration Screen
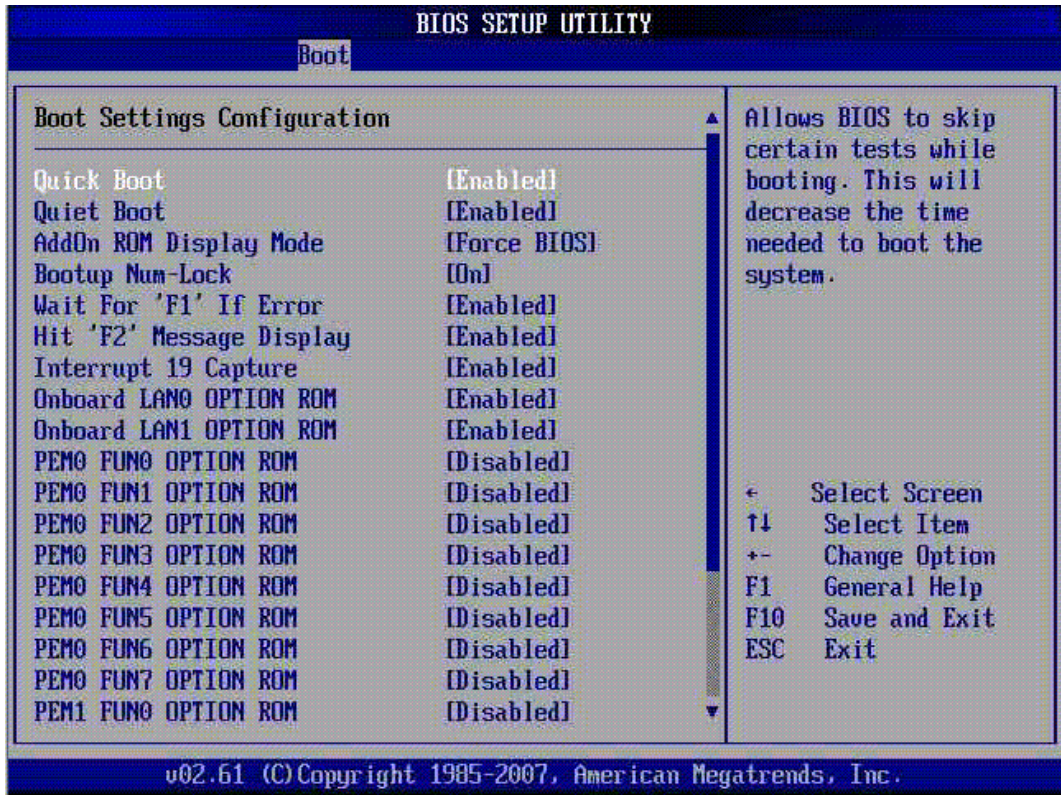
## 2.3.4.14    Boot Device Priority

The Boot Device Priority screen allows you to arrange your server's boot device order. With this screen you can designate a primary boot device, as well as manage secondary boot devices (see FIGURE 2-17).

**FIGURE 2-17**  BIOS Setup Menu Boot Device Priority Screen



```
                         BIOS SETUP UTILITY
              Boot

  Boot Device Priority                                 Specifies the boot
 ──────────────────────────────────────────           sequence from the
  1st Boot Device           [HDD:3M-STI Flash 8]       available devices.
  2nd Boot Device           [Network:IBA GE Slo]
  3rd Boot Device           [Network:IBA GE Slo]       A device enclosed in
                                                       parenthesis has been
                                                       disabled in the
                                                       corresponding type
                                                       menu.


                                                       ←     Select Screen
                                                       ↑↓    Select Item
                                                       +-    Change Option
                                                       F1    General Help
                                                       F10   Save and Exit
                                                       ESC   Exit


        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

**Note –** An installed NIC PCIe ExpressModule will allow you to see additional boot devices.

## 2.3.4.15 Hard Disk Drives

The Boot Hard Disk Drives screen shows you the boot sequence of available hard drives. The Sun Blade X6450 server module is a diskless blade. However, when installed, the compact flash card and the SSD can appear as a boot drives in this screen (see FIGURE 2-18). Likewise, an installed NIC PCIe ExpressModule will allow you to see additional boot devices in the Boot Device Priority screen.

**FIGURE 2-18**  BIOS Setup Menu Boot Hard Disk Drives Screen
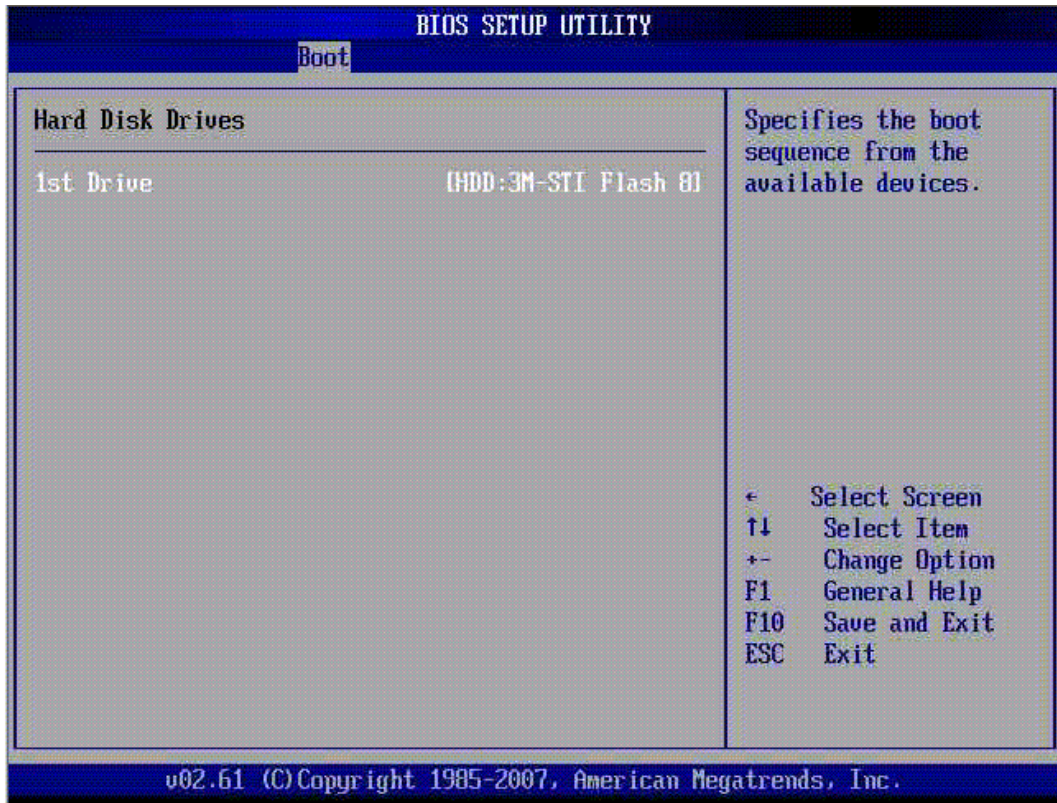
## 2.3.4.16 Server

The Server screen allows you to verify the status of the BMC (SP), view version information for IPMI and BMC, view NIC MAC addresses, and configure AST2000 LAN and remote access settings. You can also configure AC power loss restoration, the external serial port, event logging, and you can reset the BMC password.

**FIGURE 2-19** BIOS Setup Menu Server Screen
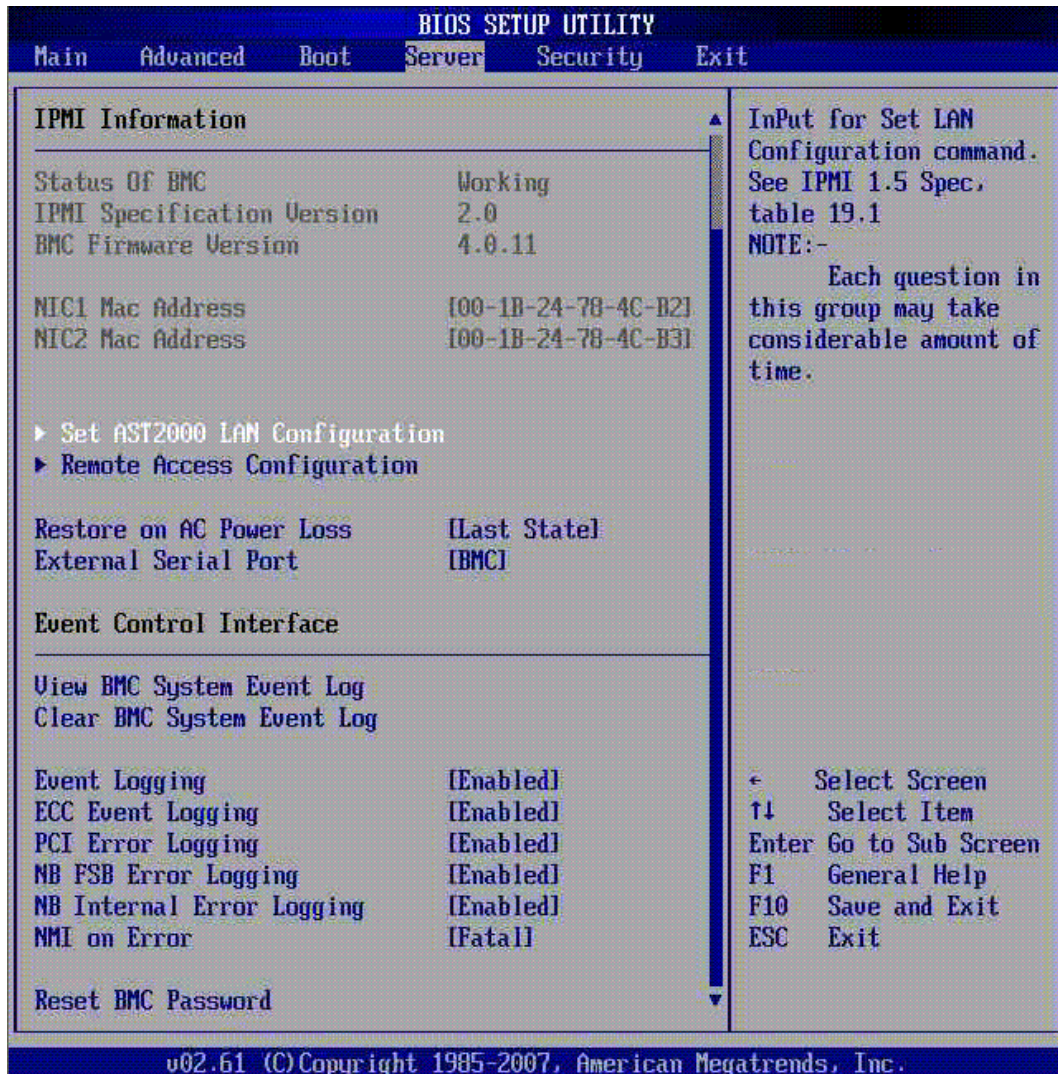
## 2.3.4.17 AST2000 LAN Configuration

Use the LAN Configuration screen to configure the AST2000 LAN settings, such as channel number, IP address, MAC address, and subnet mask. You can also verify the channel number status.

**FIGURE 2-20** BIOS Setup Menu Server LAN Configuration Screen

```
                         BIOS SETUP UTILITY
                         Server

 LAN Configuration.                                 Enter channel number
 ─────────────────────────────────────────────     for SET LAN Config
 Channel Number                 [01]                Command.
 Channel Number Status:   Channel number is OK      Proper value below 16.
 ▶ IP Address
 ▶ MAC Address
 ▶ Subnet Mask



                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    Enter Update
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit



        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
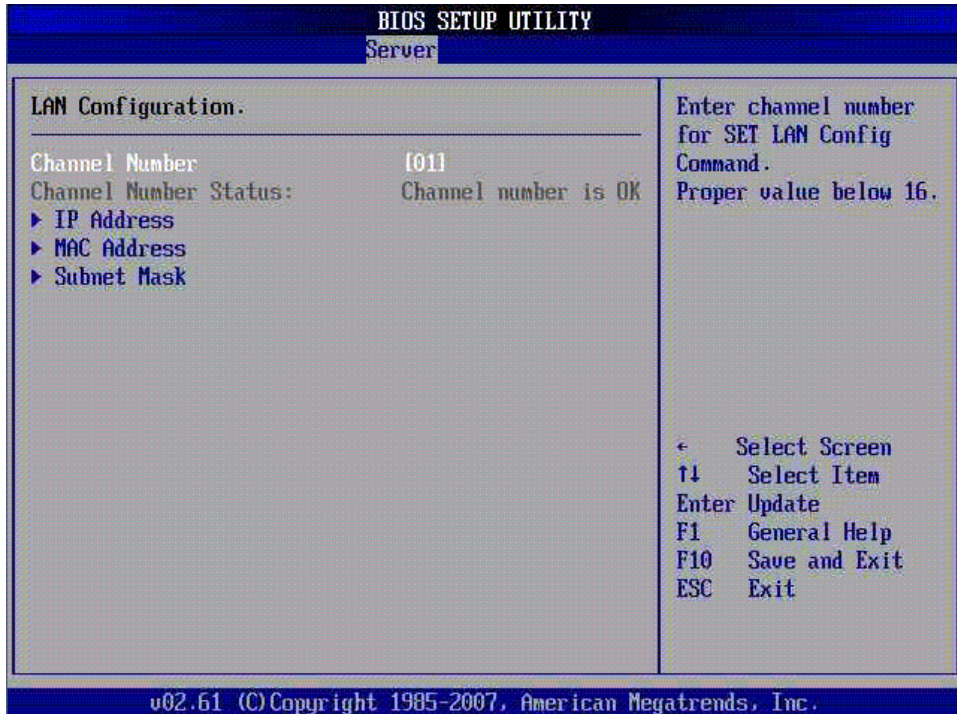
## 2.3.4.18      Remote Access Configuration

The Server Remote Access Configuration screen allows you to configure remote access type and parameters. For example, you can enable or disable remote access, set the serial port number and mode, flow control, redirection after POST, and terminal type.

**FIGURE 2-21** BIOS Setup Menu Server Remote Access Configuration Screen

```
                         BIOS SETUP UTILITY
                              Server

 Configure Remote Access type and parameters          Select Remote Access
                                                       type.
 _____
 Remote Access                  [Enabled]

 Serial port number             [COM2]
 Serial Port Mode               [115200 8,n,1]
 Flow Control                   [None]
 Redirection After BIOS POST    [Enabled]
 Terminal Type                  [ANSI]

                                                   ←     Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit


        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```
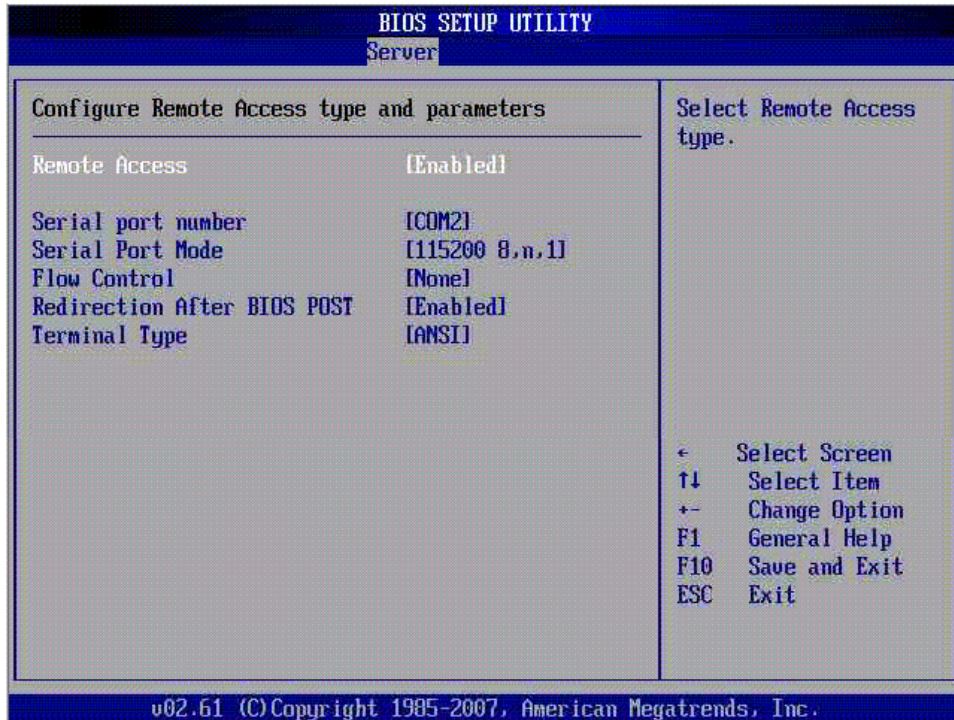
## 2.3.4.19    Reset BMC Password

The Server Reset BMC Password option allows you to reset the password for the preconfigured default user account, root. This is the password that you use with the root user name to log in to both the web interface and the command-line interface (CLI). Use the Reset BMC Password option if you changed the root password and have lost or forgotten the password. When reset the password changes back to the default, changeme.

---

**Note –** With ILOM 3.0 it is possible to delete the default user account, root. If it has been deleted, nothing changes when you select Reset BMC Password.

---

**Tip –** Use the web interface or the CLI to create a backup root account with administrator privileges. See the ILOM 3.0 documentation collection for details.

---

**FIGURE 2-22**  BIOS Setup Menu Server Reset BMC Password Screen

## 2.3.4.20　Security Settings

The Security Settings screen allows you to view the status of the Supervisor password. The screen also allows you to change the password (see FIGURE 2-23). When you change or create a password, the status indicator on this screen changes from Not Installed to Installed. The password provides security for the BIOS Setup Utility. When the password is installed, access to the BIOS Setup Utility is protected by the password.

**Note –** To prevent unauthorized access to the BIOS Setup Utility, install and maintain the Supervisor password.

**FIGURE 2-23** BIOS Setup Menu Security Change Supervisor Password Screen
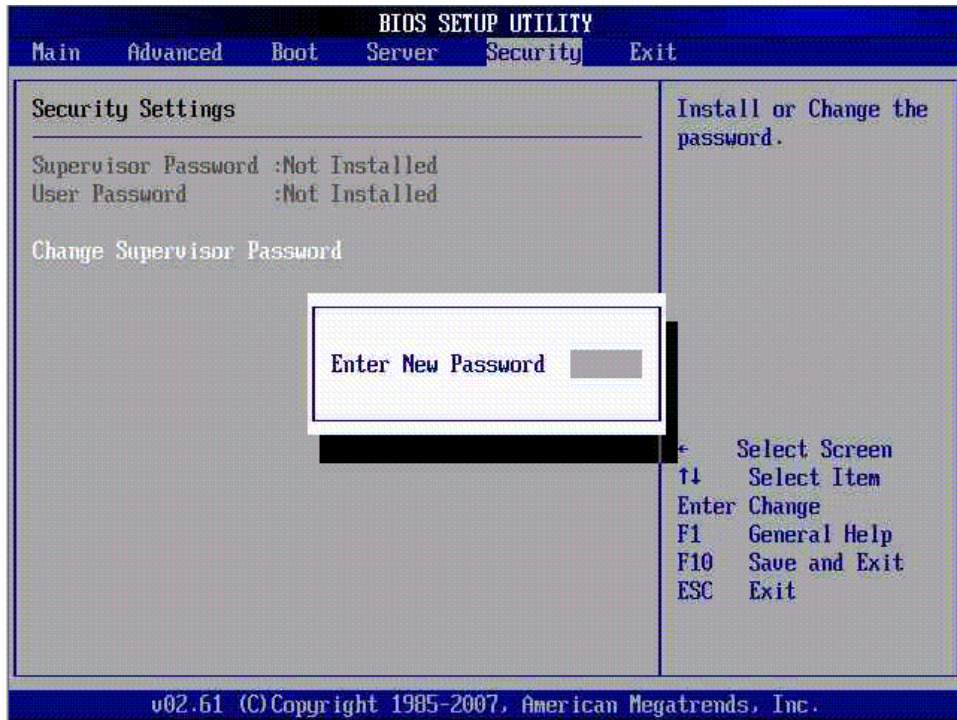
## 2.3.4.21　Exit

The Exit screen allows you to save any changes you made and exit the BIOS Setup Utility, discard changes and exit the utility, or discard changes and not exit the utility (see FIGURE 2-24). The Exit screen also allows you to load optimal defaults (see FIGURE 2-25) and load failsafe defaults (see FIGURE 2-26).

**FIGURE 2-24**  BIOS Setup Menu Exit Screen
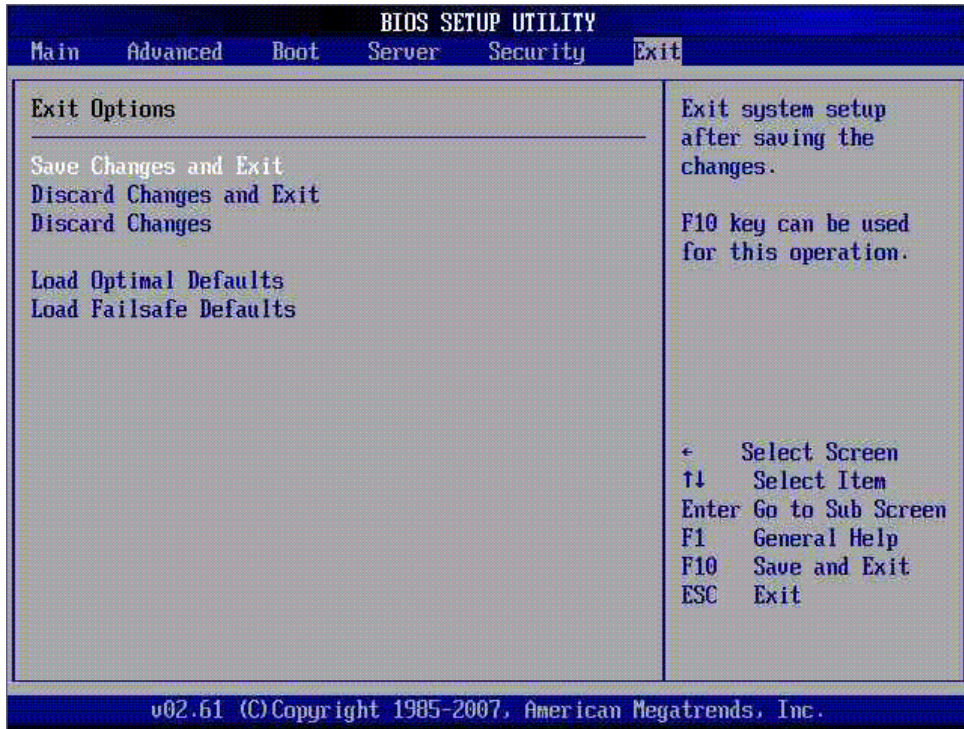
**FIGURE 2-25** BIOS Setup Menu Exit Load Optimal Defaults Screen
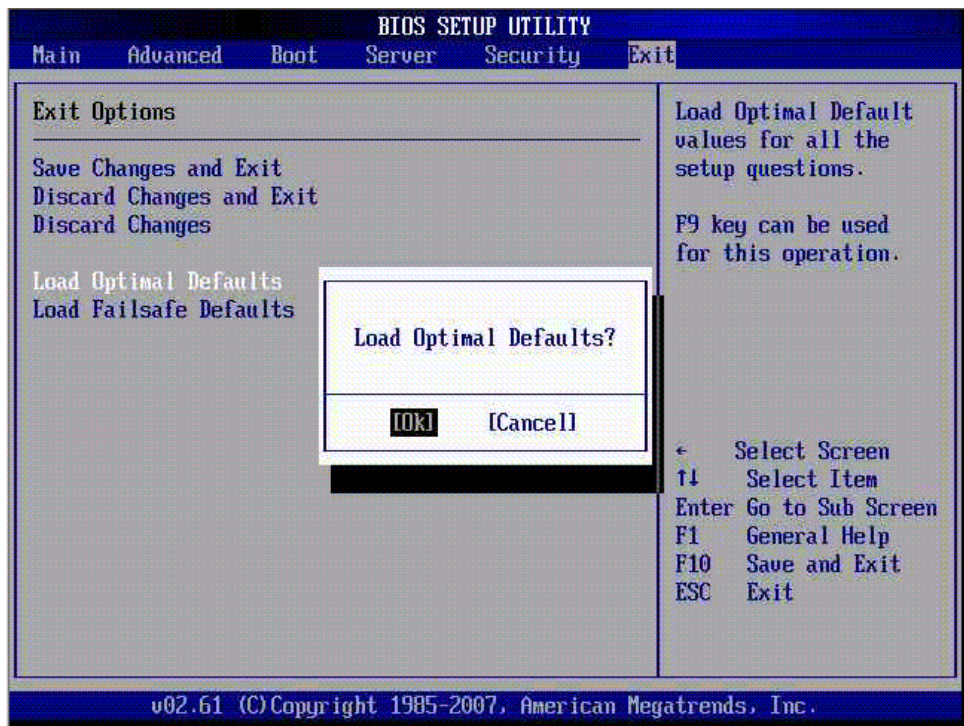
**FIGURE 2-26** BIOS Setup Menu Exit Load Failsafe Defaults Screen



```
                        BIOS SETUP UTILITY
 Main    Advanced    Boot    Server    Security    Exit

 Exit Options                                    Load Failsafe Default
 ─────────────────────────────────────          values for all the
 Save Changes and Exit                           setup questions.
 Discard Changes and Exit
 Discard Changes                                 F8 key can be used
                                                 for this operation.
 Load Optimal Defaults
 Load Failsafe Defaults
                    ┌─────────────────────────┐
                    │   Load Failsafe Defaults?│
                    │                          │
                    │                          │
                    │    [Ok]      [Cancel]    │
                    └─────────────────────────┘
                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 Enter Go to Sub Screen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit


        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

## 2.4 Resetting the BMC, BIOS, and CMOS

This section provides information about resetting the SP, BIOS, and CMOS passwords. You can use the BIOS Setup Utility to reset the SP password. To access the BIOS Setup Utility, you must setup the server with a keyboard, video, and mouse (KVM). You can attach a KVM to the server or use a remote KVM (RKVM).

You need to use a hardware-based option to reset the BIOS password and clear the CMOS password. This option requires that you remove the server module from the chassis, access the motherboard, and use a jumper to short pins on jumper J42.

- To reset the BMC password using the BIOS Setup Utility, see "To Reset the SP Password Using the BIOS Setup Utility" on page 2-33.
- To reset the BIOS password and clear CMOS, see "To Reset the BIOS Password and Clear CMOS Using J42" on page 2-34.

## ▼ To Reset the SP Password Using the BIOS Setup Utility

1. **Set up the server module so that you can view POST messages and access the BIOS Setup Utility.**

   - You can connect the multi-port dongle cable to the UCP on the front of the server and attach a KVM to the dongle cable (see the *Sun Blade X6450 Server Module Installation Guide*).

     *-or-*

   - You can use the ELOM or ILOM Remote Console application, and configure the server module to boot to BIOS (see the *Sun Blade X6450 Server Module Embedded Lights Out Manager Administrative Guide* or the corresponding ILOM documentation collection).

2. **Reboot the server module, and watch the display for the prompt to press F2.**

   If you are using the ELOM's Remote Console application, the server will boot directly into the BIOS Setup Utility, and you can skip to Step 4.

3. **When prompted, press F2 to enter the BIOS Setup Utility.**

   The BIOS Setup Utility appears.

4. **Use the arrow keys to navigate to the Server screen.**

   The Server screen appears.

5. **Use the down arrow key to highlight the Reset BMC Password option.**

6. **Press Enter.**

   The Reset BMC Password Now? pop-up appears (see FIGURE 2-22).

7. **Use the arrow keys to highlight OK, and press enter.**

   The BMC password is reset.


# ▼ To Reset the BIOS Password and Clear CMOS Using J42

**Note –** Clearing the CMOS password resets the BMC (SP) password.

1. **Place the server in standby power mode by using a non-conducting pointed object, such as a stylus, to press and release the recessed Power button on the front panel.**

   See Section 2.2, "Powering Off the Server" on page 2-4.

**Caution –** The sever module contains components that are extremely sensitive to static electricity. Before handling components, attach an ESD wrist strap to chassis bare metal or the grounding post that is built into the rear of the chassis.

2. **Remove the server module from the chassis. See** "To Remove the Server Module From the Chassis" on page 3-13.

3. **Remove the cover from the server. See** "To Remove the Main Cover" on page 3-15.

4. **Place the server module on an anti-static mat, and remove the top cover.**

5. **Put on the ESD wrist strap, and attach the grounding cord to the chassis' bare metal or the chassis grounding post.**

6. **Locate jumper J42 on the motherboard.**

   J42 is located on the rear corner of the motherboard near the CF card slot. J42 is the 6-position jumper located to the left of a 10-pin jumper (see FIGURE 2-27).

**FIGURE 2-27** Location of J42 on the Motherboard With Pin 1 Shown
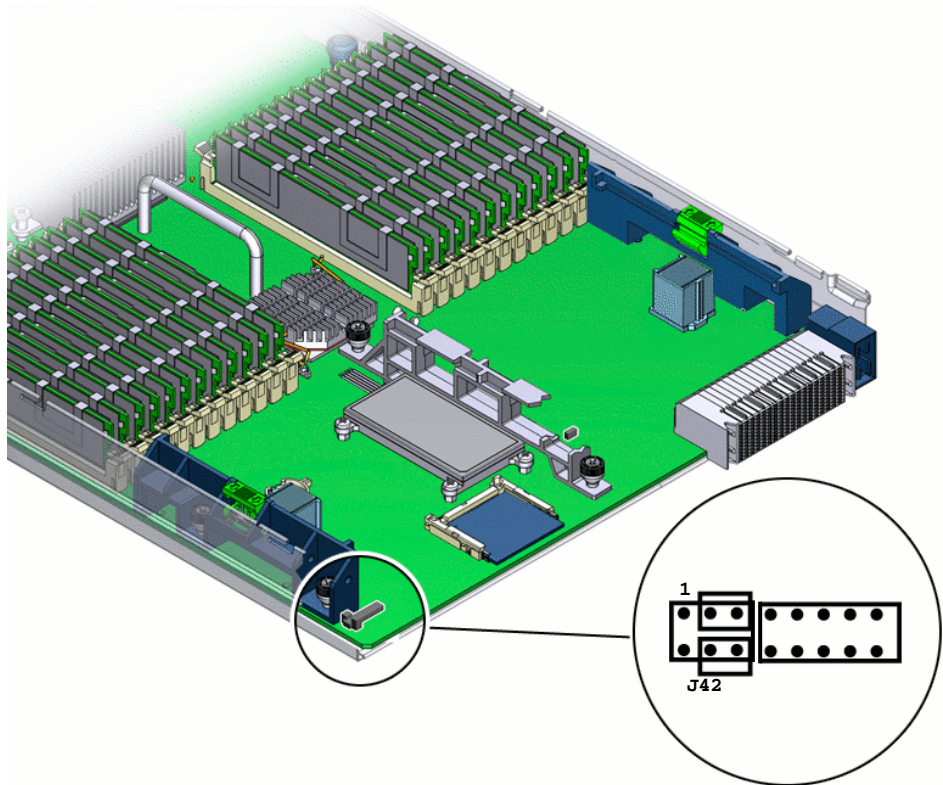


Two jumper caps are preinstalled on J42. The caps are set in the default or safe position.

FIGURE 2-28 shows the pin numbering for jumper J42 and the jumper caps in the default or safe position:

**FIGURE 2-28** Pinout for Jumper J42 and the Caps in the Safe Position



View from rear of server
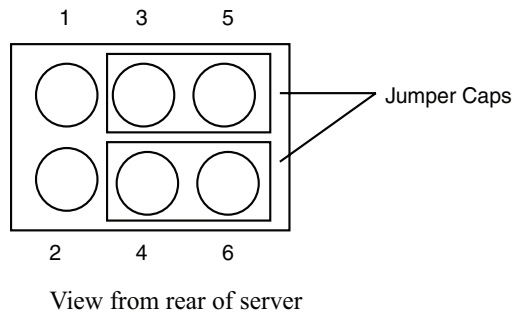
**7. Change jumper caps on J42 as follows:**

| Task: | Short Pins: | Go to: |
|---|---|---|
| Default or Safe Position | 3-5 and 4-6 | n/a |
| Clear BIOS | 2-4 and 3-5 | Step a |
| Clear CMOS | 1-3 and 4-6 | Step b |
| Clear both BIOS and CMOS | 2-4 and 1-3 | Step c |

  **a. To clear the BIOS password, move the jumper cap *from* pins 4 and 6 *to* pins 2 and 4 (see** FIGURE 2-29**), and proceed to** Step 8**.**

**FIGURE 2-29** J42 With the Jumper Set to Reset the BIOS Password.



View from rear of server
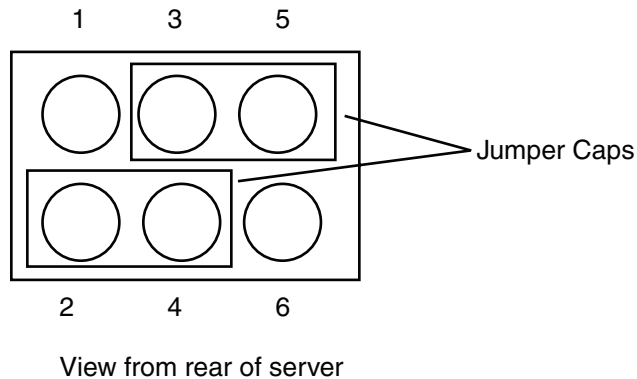
  **b. To clear the CMOS password, move the jumper cap *from* pins 3 and 5 *to* pins 1 and 3 (see** FIGURE 2-30**), and proceed to** Step 8**.**

**FIGURE 2-30** J42 With the Jumper Set to Clear the CMOS Password.



1    3    5

Jumper Caps

2    4    6
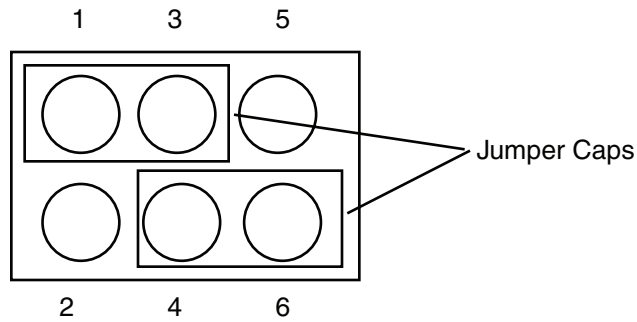
View from rear of server

   **c. To reset the BIOS password *and* clear the CMOS password move the jumper cap *from* pins 4 and 6 *to* pins 2 and 4, and move the jumper *from* pins 3 and 5 *to* pins 1 and 3 (see** FIGURE 2-31**), and proceed to** Step 8**.**

**FIGURE 2-31** J42 With the Jumpers Set to Reset the BIOS Password and Clear the CMOS Password.



1    3    5

Jumper Caps

2    4    6
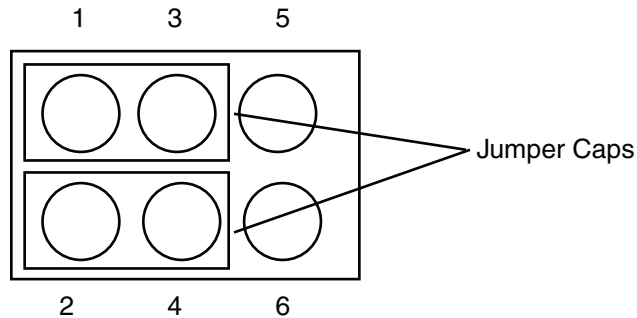
View from rear of server

**8. Install the server's main cover.**

**9. Insert the server module into the chassis.**

10. **Return the server to full power mode by using a non-conducting pointed object, such as a stylus, to press and release the recessed Power button on the front panel.**

    To clear the CMOS and reset the passwords, you must allow the server to boot to full power. After POST you will see the message:

    ```
    CMOS password cleared by jumper.
    ```

    This message indicates that the CMOS password was cleared. At this point the BIOS password is reset.

11. **Repeat** Step 1 **through** Step 10**, and at** Step 7 **return the jumpers to the default or safe positions locations.**

---

**Note –** You must return the CMOS jumper to pins 3 and 5 before you can use the server module. If you do not return the BIOS password jumper to pins 4 and 6, you will be unable to enter a BIOS password.

---

# 2.5 Recovering from a Corrupt Service Processor

If the service processor (SP) software becomes corrupted, you can install the default image from the Tools and Drivers CD. For revision 1 motherboards, you need to remove the server from the chassis, and short the connections on jumper block J19 and J44 on the motherboard. For revision 2 motherboards, you might need to change the jumper cap position on jumper J51, in addition to shorting the connections on J19 and J44.

Before You Begin

To perform this procedure, you have must have:

- A bootable USB flash device to load files and boot the server module
- Two jumper caps to short the pins on jumper blocks J19 and J44
- A keyboard, video, and mouse (KVM) attached to the server module to monitor the recovery process and respond to system prompts

# ▼ To Recover from a Corrupt Service Processor

1. **Determine the revision of your server module's motherboard.**

   For information about how to determine the revision of your server module's motherboard, see Section 1.4, "Identifying Sun Blade X6450 Server Module Revisions" on page 1-7.

2. **Copy all BMC files from the Tools and Drivers CD to a DOS-bootable USB flash device.**

   The BMC files are located in the /firmware/bmc directory, on the Tools and Drivers CD. They consist of:

   - SOCFLASH.EXE
   - DOS4GW.EXE
   - BMC Binary (SP Binary file)

3. **Place the server in standby power mode by using a non-conducting pointed object, such as a stylus, to press and release the recessed Power button on the front panel.**

   See Section 2.2, "Powering Off the Server" on page 2-4.

---

**Caution –** The sever module contains components that are extremely sensitive to static electricity. Before handling components, attach an ESD wrist strap to chassis bare metal or the grounding post that is built into the rear of the chassis.

---

4. **Remove the server module from the chassis. See** "To Remove the Server Module From the Chassis" on page 3-13**.**

5. **Remove the cover from the server. See** "To Remove the Main Cover" on page 3-15**.**

6. **Place the server module on an anti-static mat, and remove the top cover.**

7. **Put on the ESD wrist strap, and attach the grounding cord to the chassis' bare metal or the chassis grounding post.**

8. **If necessary, remove the optional Fabric Expansion Module (see** Section 3.4.6, "Installing and Replacing a Fabric Expansion Module" on page 3-40**).**

9. **Use a jumper cap to short the pins on jumper block J19 and jumper block J44 (see** FIGURE 2-32**).**

   If your server is revision 1, go to Step 11.

**FIGURE 2-32** Location of Jumpers J19 and J44 on the Motherboard.
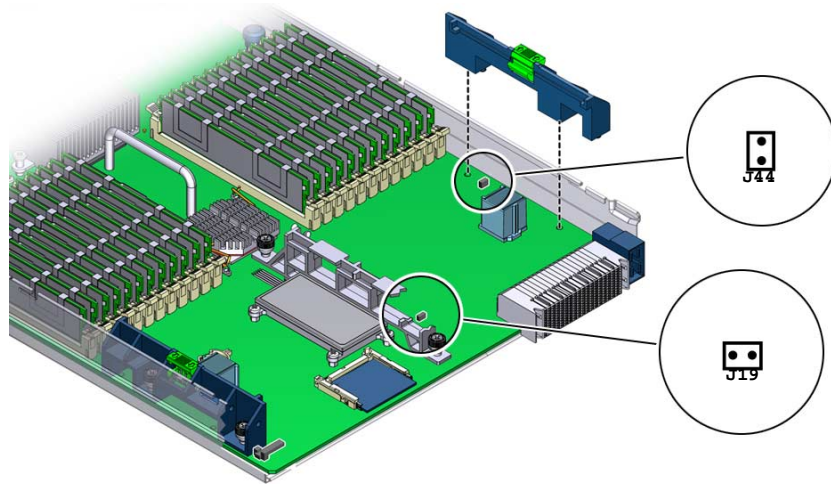


10. **If your server module is revision 2 and does not have low voltage DIMMs, move the jumper cap on J51 from pins 1 and 2 (default position) to pins 2 and 3 (see** FIGURE 2-33**).**

   Depending on the type DIMMs installed in your server module, the jumper cap might already set to pins 2 and 3.

**FIGURE 2-33** The Location and Default Setting of J51
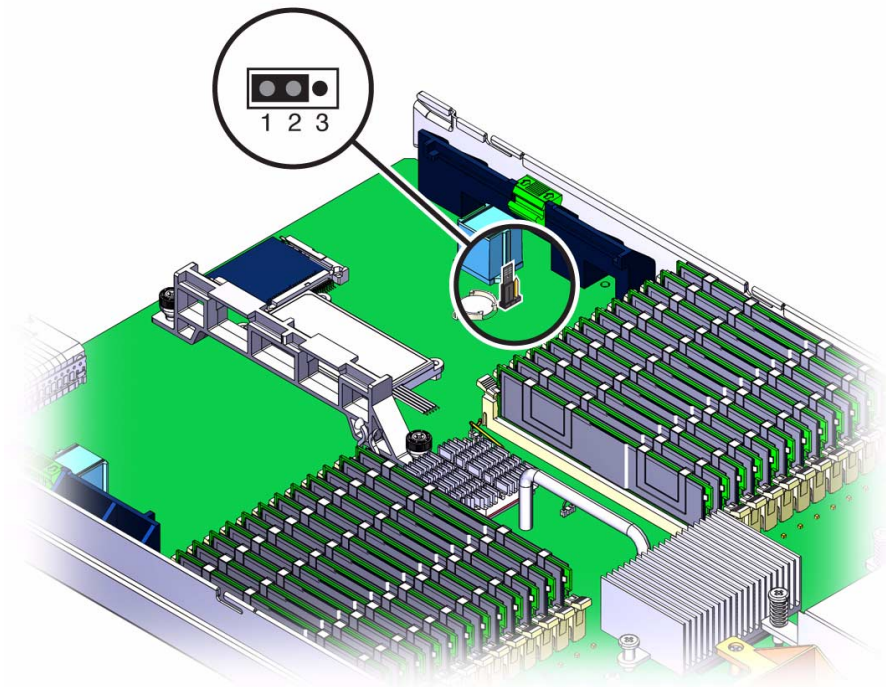


11. **With the pins shorted on jumper block J19, J44, and pins 2 and 3 of J51 (revision 2 MB only), remove the wrist strap's grounding cord from the chassis, and replace and secure the top cover.**

12. **Insert the server module into the chassis.**

13. **Insert the bootable USB flash drive into the USB port.**

14. **Power on the system by pressing the Power button.**

---

**Note –** You must press the power button to power on the server module. When the server module has jumpers installed, it does not automatically power on when inserted into the chassis.

---

- When the server module is has jumpers installed, the amber Service Action Required LED lights.
- A message appears on the video console stating that the BMC was not found.
- The system takes up to three minutes to boot.

15. **Press F8 to get a list of boot devices.**

16. **Set the USB flash device as the primary boot device, and save and exit.**

    The server module boots to DOS from the USB flash device, and a DOS prompt appears:

    ```
    >
    ```

17. **When the DOS prompt appears, run the following command, depending on whether your SP is ELOM-based or ILOM-based:**

    ■ For *ELOM-based* service processors:

      **socflash** *SP binary    backup file*

      Where *SP binary* is name of the firmware file.
      Where *backup file* is the backup filename.

      For example:

      **socflash x6450bmc.bin backup.bin**

    ■ For *ILOM-based* service processors:

      **socflash -p1 -f** *filename*

      Where *filename* is the name of the ILOM .bin file.

      For example:

      ```
      > socflash -p1 -f ilom-X6450.bin
      ```

18. **After a successful flash, remove the server module from the chassis, and remove the jumper caps from jumper blocks J19 and J44.**

19. **If necessary, move the jumper cap from pins 2 and 3 to pins 1 and 2 on jumper J51 (revision 2 only).**

20. **Insert the server module into the chassis, leaving the system powered off for at least 30 seconds.**

    The server module must be set up to view the BIOS Setup Utility.

21. **Power on the system; watch the display, and when prompted, press F2 to enter the BIOS Setup Utility.**

22. **Verify the status of the BMC and the BMC version in the BIOS Setup Utility under the Server screen.**

23. **Exit the BIOS Setup Utility.**

    Press Esc or F10 to exit.

## 2.6        Power-On Self-Test (POST)

For information about BIOS POST testing, POST codes, POST code checkpoints, and console redirection, see Appendix B.

# Maintaining the Server

This chapter contains information and procedures for servicing your Sun Blade X6450 server module hardware, including component removal and replacement procedures.

The following topics are covered in this section:

- Section 3.1, "Monitoring System Components" on page 3-2
- Section 3.2.1, "Tools and Supplies Needed" on page 3-13
- Section 3.2.2, "Components and Part Numbers" on page 3-13
- Section 3.2.3, "Preparing the Server Module for Service" on page 3-13
- Section 3.3, "Troubleshooting Server Issues" on page 3-17
- Section 3.4, "Replaceable Component Procedures" on page 3-20

# 3.1 Monitoring System Components

You can monitor the status of system components using the external front panel Service Action Required LED, the ELOM or ILOM web interface, or the ELOM or ILOM command-line interface (CLI).

This section contains the following procedures:

- "Monitoring System Components Using the External Service Action Required Indicator LED" on page 2
- "Monitoring the System and Components Using the SP Web Interface" on page 5
- "Monitoring System Components Using the SP CLI" on page 9

## 3.1.1 Monitoring System Components Using the External Service Action Required Indicator LED

The Service Action Required LED, which is located on the server front panel, enables you to monitor the server's status. The state of the LED alerts you to the condition of the server module. FIGURE 3-1 shows the locations of the Service Action Required LED. TABLE 3-1 describes the LED states of all the front panel LEDs, including the Service Action Required LED.

When you use the Service Action Required LED in conjunction with the internal fault LEDs, you can isolate server issues to a specific component, such as a CPU or a DIMM.

For more information about using the external front panel LED and the internal fault LEDs to troubleshoot server issues, see Section 3.3, "Troubleshooting Server Issues" on page 3-17.

**FIGURE 3-1** External LEDs
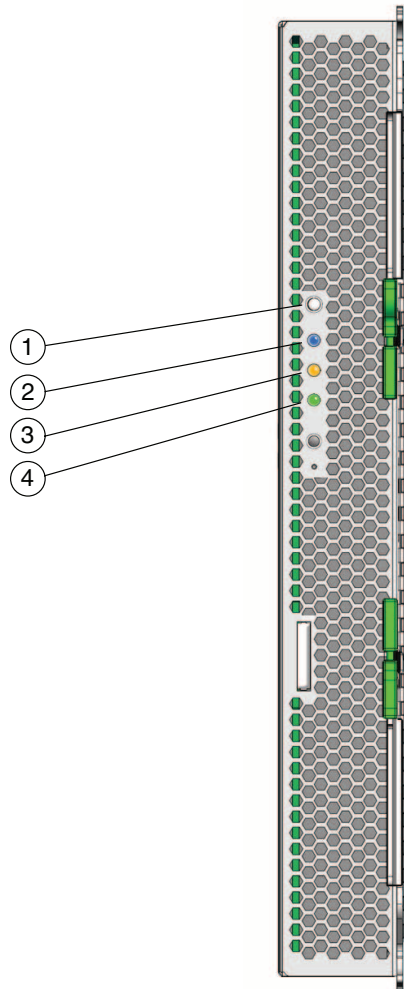


**Figure Legend**

| | |
|---|---|
| **1** | White Locate LED button |
| **2** | Blue LED – Ready to Remove |
| **3** | Amber LED – Service Action Required |
| **4** | Green LED – OK |

**TABLE 3-1**   Front Panel LED Functions

| LED Name | Description |
|---|---|
| Locate button/LED–White | This LED helps you to identify which system you are working on.<br><br>The following actions activate it:<br><br>**Push and release this button**, or use service processor commands to make the Locate LED blink for 30 minutes.<br><br>• From the ILOM web interface:<br><br>1) Navigate to System Monitoring -> Indicators.<br><br>2) Highlight Sys/Locate.<br><br>3) select Turn LED Off or Set LED to Fast Blink from the pull down menu.<br><br>• From the ILOM CLI, enter:<br><br>**/SYS/LOCATE value=FastBlink** or<br><br>**/SYS/LOCATE value=Off**<br><br>**Hold down this button for 5 seconds to initiate a "lamp test"** mode that illuminates other LEDs for 15 seconds. |
| Ready to Remove LED–Blue | The server module is ready to be removed from the chassis.<br><br>• For ELOM or ILOM 2.0, this LED is switched on by the service processor when the server module main power is off.<br><br>• For ILOM 3.0, this LED can only be switched on and off by using the ILOM web interface or CLI. |
| Service Action Required LED–Amber | On systems equipped with an ELOM service processor, this LED has three states:<br><br>• Off: Normal operation.<br><br>• Slow Blinking: A new (unacknowledged) event requiring a service action has been detected.<br><br>• On: The event has been acknowledged, but the problem still requires attention.<br><br>On systems equipped with an ILOM service processor, this LED has two states:<br><br>• Off: Normal operation.<br><br>• On: Fault detected. |
| Power/OK LED–Green | Off – Server main power and standby power are off.<br><br>Standby Blinking (.1 sec On, 2.9 sec Off) – Standby power.<br><br>On – Server is in main power mode. |
| ELOM and ILOM 2.0 Startup | The blue, amber, and green LEDs blink at 1 second intervals until the ILOM services are running. |

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

| LED Name | Description |
| --- | --- |
| ILOM 3.0 Startup | The blue, amber, green, and white LEDs blink three times, at one second invervals (.5 sec On, .5 sec Off). |
| | After the three blinks, the green LED goes to fast blink while the ILOM performs power calculations (.125 sec On, .125 sec Off). |
| | When the system is ready to turn on, the green LED stays On for 3 seconds. You can now press the Power button to power on the host (go to main power mode). |
| | Otherwise it goes to standby blink (.1 sec On, 2.9 sec Off). |

## 3.1.2    Monitoring the System and Components Using the SP Web Interface

You can use the ELOM web interface or the ILOM web interface to monitor the status of the server module, and investigate the system when the front panel Service Action Required LED is on or blinking.

## ▼ To Monitor the System and Components Using the SP Web Interface

1. **Log in to the web interface, as described in your SP documentation.**

2. **View system and component information:**

   - For ELOM:

a. **Click the System Monitoring tab, and use the submenu screens to view system information and component status.**

TABLE 3-2 lists the System Monitoring submenu tabs and the monitoring tasks that you can perform.

**TABLE 3-2**     The ELOM System Monitoring Tab Submenu Screens and Tasks

| System Monitoring Tab | Task(s) |
| --- | --- |
| Versions | View server board and BMC versions. |
| Session Timeout | Disable or enable and set the session inactivity timer. |
| Components | View CPU, memory (DIMM) and NIC information. |

b. **To view component information, click the Components submenu tab.**

The Components CPU, Memory, and NIC submenu tabs appears (see FIGURE 3-2).

**FIGURE 3-2**     The Components Submenu Tabs
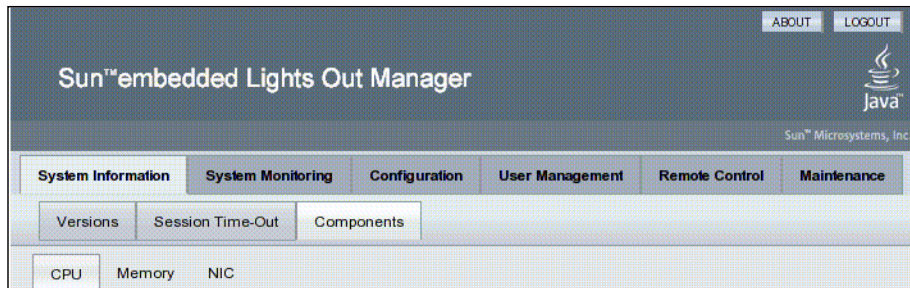


The ELOM's Components submenu screens allows you to monitor and troubleshoot the server module's critical components, the CPUs, the memory (DIMMs), and the NIC. Use the CPU and Memory screens in conjunction with the Service Action Required LED to further investigate service-related issues.

c. **Click the submenu screens to view component information.**

TABLE 3-3 lists the System Monitoring tabs and the tasks that you can perform.

**TABLE 3-3**    The ELOM System Monitoring Tab Submenu Screens and Tasks

| System Monitoring Tab | Task(s) |
|---|---|
| Sensors Reading | View the name, type and readings of sensors. |
| Indicators | View the name and status of the indicators and LEDs. |
| Event Logs | View events, including details such as event ID, class, type, severity, date and time, and description of event. |

For more information about using the web interface to monitor and manage the server, see *Sun Blade X6450 Server Module Embedded Lights Out Manager Administration Guide.*

■ For ILOM:

Use the System Information and the System Monitoring tabs to monitor the system and components.

a. **Click the System Information tab, and use the submenu screens to view system and component information.**

TABLE 3-4 lists the System Information tabs and the task that you can perform.

**TABLE 3-4**    The ILOM System Information Tab Submenu Screens and Tasks

| System Monitoring Tab | Task(s) |
|---|---|
| Versions | View server board and BMC versions. |
| Session Timeout | Disable or enable and set the session inactivity timer. |
| Components | View CPU, memory and NIC information. |
| Identification Information | Change the SP(BMC) identification information, such as hostname and address. |

b. **See your ILOM documentation collection for more information about using the System Information tab to monitor and manage the server.**

c. **Click the System Monitoring tab.**

The System Monitoring submenu screens appear. TABLE 3-5 lists the submenu tabs and the tasks that you can perform.

**TABLE 3-5**   The ILOM System Monitoring Tab Submenu Screens and Tasks

| System Monitoring Tab | Task(s) |
| --- | --- |
| Sensors Reading | View the name, type and readings of sensors. |
| Indicators | View the name and status of the indicators and LEDs. |
| Event Logs | View events, including details such as event ID, class, type, severity, date and time, and description of event. |
| Power Management (ILOM 3.0 only) | Monitor power consumption, power history, and power metrics. |

d. **See the corresponding ILOM documentation collection for more information about using the System Monitoring tab to monitor and manage the server.**

## 3.1.3 Monitoring System Components Using the SP CLI

You can use the ELOM or ILOM CLI to monitor the status of the server module, and to investigate the system when the front panel Service Action Required LED is on or blinking.

## ▼ To Monitor System Components Using the ELOM CLI

1. **Log in to the CLI, as described in the** *Embedded Lights Out Manager Administration Guide.*

2. **Navigate to either the** `/SP` **or the** `/SYS` **namespace, and use the command reference in the** *Embedded Lights Out Manager Administration Guide* **to execute the necessary commands to view system information and component status.**

   TABLE 3-6 shows the CLI namespaces and the monitoring tasks that you can perform.

**TABLE 3-6**    CLI Namespaces and Related Tasks

| Namespace | Task(s) |
|---|---|
| /SP | View version information and disable or enable and set the session inactivity timer. |
| /SYS/BoardInfo | View board manufacturer, manufacture date and time, product name, serial number, part number, and BIOS version. |
| /SYS/ProductInfo | View product manufacturer, name, part number, serial number, and asset tag. |
| /SYS/ChassisInfo | View chassis type, part number, and serial number. |
| /SYS/CtrlInfo | View the power status. Control the power. Control boot and display. Control the ID LED. |
| /SYS/CtrlInfo/FaultLed | View and control the fault LED. |
| /SYS/CPU/CPU[1:N] | View CPU socket designation, manufacturer, name, speed, and status. |
| /SYS/Memory/DIMM_[A0-D5] | View DIMM slot designation, type, speed, size, and status. |
| /SYS/Temperature/Temperature[1:N] | View temperature designation, status, sensor reading, and lower and upper thresholds. |
| /SYS/Voltage[1:N] | View voltage designation, sensor reading, and lower and upper thresholds. |
| /SYS/NICInfo0 | View NIC manufacturer, name, part number, and serial number for NIC0 |

**3. To use the CLI to troubleshoot in conjunction with the Service Action Required LED, navigate to either the** `/SYS/CPU` **or the** `/SYS/Memory` **namespace, and view individual component information:**

**a. To view the** `/SYS/CPU` **namespace:**

```
-> cd /SYS/CPU
-> show
```

Executing the `show` command returns the following:

```
/SYS/CPU
    Targets:
        CPU0
        CPU1
        CPU2
        CPU3

    Properties:

    Target Commands:
        show
        cd
```

Navigate to one of the CPU namespaces and view properties for that namespace:

```
-> cd CPU0
-> show
```

```
/SYS/CPU/CPU0
   Targets:

   Properties:
        Designation = CPU 0
        Manufacturer = Intel
        Name = Tigerton
        Speed = 2933MHz
        Status = enabled

   Target Commands:
        show
```

**b. To view the /SYS/Memory namespace:**

```
-> cd /SYS/Memory
-> show
```

Executing the show command returns the following:

```
/SYS/Memory
   Targets:
        DIMM_A0
        DIMM_A1
        DIMM_A2
        DIMM_A3
        DIMM_A4
        DIMM_A5
        DIMM_B0
        DIMM_B1
        DIMM_B2
        DIMM_B3
        DIMM_B4
        DIMM_B5
        DIMM_C0
        DIMM_C1
        DIMM_C2
        DIMM_C3
        DIMM_C4
        DIMM_C5
        DIMM_D0
        DIMM_D1
        DIMM_D2
        DIMM_D3
        DIMM_D4
        DIMM_D5

   Properties:

   Target Commands:
        show
        cd
```

Navigate to one of the DIMM namespaces:

```
-> cd DIMM_A0
```

```
–>  show
```

```
/SYS/Memory/DIMM_A0
   Targets:

   Properties:
       Designation = DIMM_A0
       Type = FBDIMM
       Size = 2048MB
       Speed = 667MHz
       Status = ok

   Target Commands:
       show
```

For more information about using the CLI to monitor and manage the server, see *Embedded Lights Out Manager Administration Guide.*

## ▼ To Monitor System Components Using the ILOM CLI

1. **Log in to the CLI, as described in the** *Sun Integrated Lights Out Manager 2.0 User's Guide.*

   The CLI prompt appears:
   –>

2. **Navigate to either the** /SP/faultmgmt **or the** /SYS **namespace for the server module using one of the following commands:**

   –> **cd /SP/faultmgmt**  on ILOM 2.0

   –> **cd /SP/alertmgmt**  on ILOM 3.0

   –> **cd /SYS**

   See the corresponding ILOM documentation collection for additional information.

## 3.2   Servicing the Server Module

This section contains preparatory service procedures and other information, including a list of required tools and supplies, and information about obtaining up-to-date supported components and part numbers.

## 3.2.1 Tools and Supplies Needed

The server can be serviced with the following items:

- No. 2 Phillips screwdriver
- Adjustable-setting torque driver (5–20 in-lbs)
- Antistatic wrist strap
- A non-conducting pointed object, such as a stylus, to press the recessed Power button

## 3.2.2 Components and Part Numbers

Supported components and part numbers are subject to change over time. For the most up-to-date list, go to:

http://sunsolve.sun.com/handbook_pub/Systems/

Click the name and model of your server, and click then Full Components List for the list of components and part numbers.

## 3.2.3 Preparing the Server Module for Service

The following basic procedures describe how to prepare the server module for service. The procedures describe how to safely remove the server module from the chassis and how to remove the top cover. These procedures are referenced throughout this manual:

- "To Remove the Server Module From the Chassis" on page 3-13
- "To Remove the Main Cover" on page 3-15
- "To Insert the Server Module" on page 3-15

## ▼ To Remove the Server Module From the Chassis

To replace components or access the Remind button, you need to remove the server module from the chassis.

1. **Place the server in standby power mode. See** Chapter 2 **for information about powering the server on and off.**

   When the server is in standby power mode, the Power/OK LED on the front panel begins blinking.

2. **Remove the server module from the chassis. See** **.**

   a. **Squeeze and hold green ejector buttons.**

   b. **Open the ejector levers by rotating the ejector arms away from the server module.**

      This action unseats the server module from the chassis connector.

   c. **Pull the server module out of the chassis by the ejector levers until you are able to grasp the module with both hands to pull it out of the chassis.**

**FIGURE 3-3**   Removing a Server Module
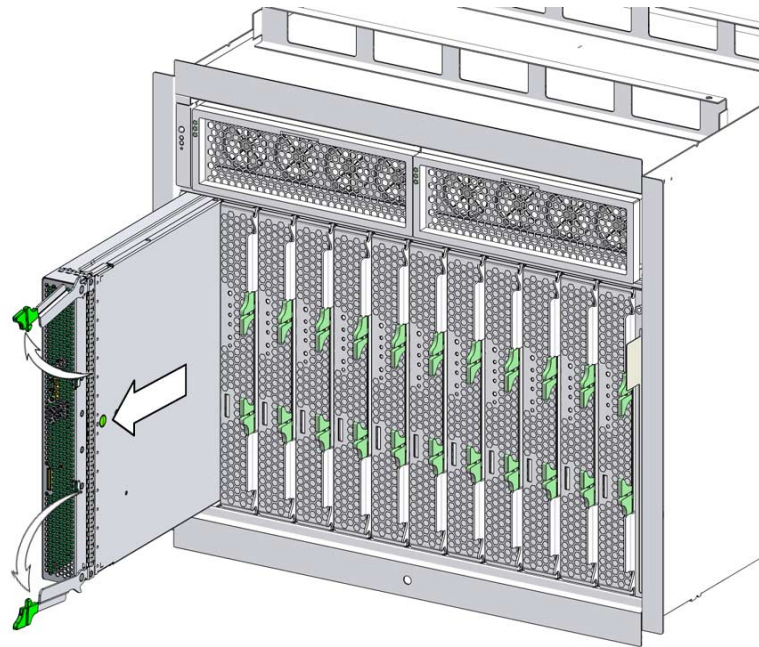


**Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

3. **Set the server module on an antistatic surface.**

<table>
<tr>
<td>

!

</td>
<td>

**Caution –** Damage to system components can occur through improper handling. Observe the proper ESD precautions when handling the CPU. Wear a securely grounded ESD wrist strap. Handle components by the edges only. Do not touch metal contacts.

</td>
</tr>
</table>

# ▼ To Remove the Main Cover

1. **Press down on the cover release button and, using the indent for leverage, slide the main cover toward the rear of the chassis approximately 0.5 inch (12 mm). See** FIGURE 3-4**.**

2. **Grasp the cover by its rear edge and lift it straight up from the chassis.**

**FIGURE 3-4** Removing the Main Cover
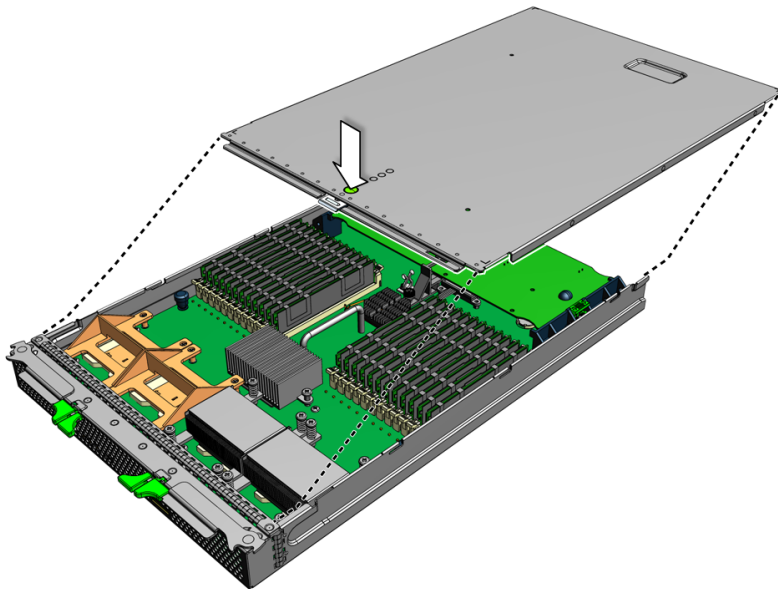


# ▼ To Insert the Server Module

1. **Locate the desired slot in the chassis.**

2. **Remove the filler panel.**

   Pull the lever out and eject the filler panel.

   Do not discard the filler panel.

⚠️ **Caution –** Do not operate the system with empty slots. Always insert a filler panel into an empty slot to reduce the possibility of module shutdown.

3. **Position the server module vertically so that the ejectors are on the right.**

   The following illustrations show the server module being inserted into the Sun Blade 6000 modular system; your chassis might differ. See FIGURE 3-5, box 1 in [1].

**FIGURE 3-5**   Inserting the server module.
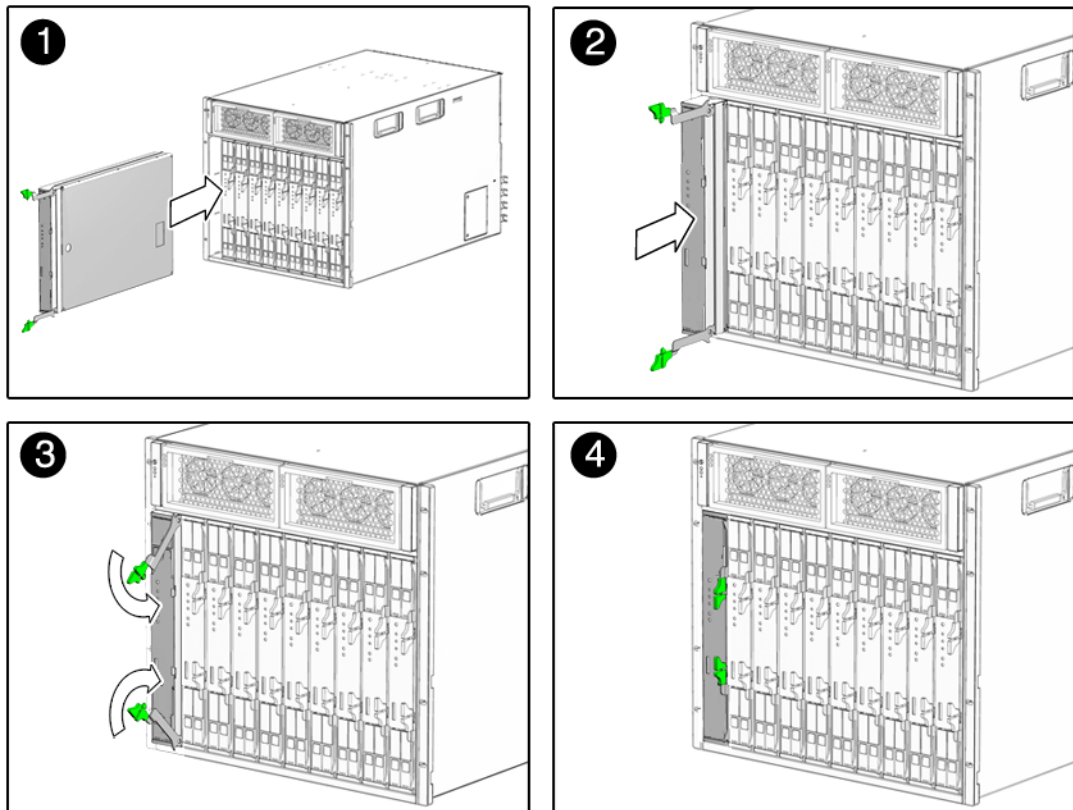


4. **Push the server module into the slot until the server module stops.**

   See FIGURE 3-5 [2].

**5. Rotate the ejectors down until they snap into place.**

The server module is now flush with the chassis, and the ejectors are locked. See FIGURE 3-5 boxes 3 and 4 in [3,4].

If the chassis is powered on, the server module comes up to standby power. The green OK LED on the front panel blinks.

■ With ELOM and ILOM 2.0, the blue OK to Remove LED remains on.

■ With ILOM 3.0, the blue OK to Remove LED remains off.

## 3.3     Troubleshooting Server Issues

You can use the external front panel Service Action Required LED to monitor the status of the server (for location, see FIGURE 3-1). When the LED is on or blinking, the server is in need of maintenance.

## ▼ To Troubleshoot Server Issues

**1. Place the server in standby mode.**

The Power/OK LED blinks when the server is in standby mode.

**2. Choose one of the following methods to troubleshoot the issue:**

■ Use the ELOM web interface: See Section 3.1.2, "Monitoring the System and Components Using the SP Web Interface" on page 3-5.

■ Use the ELOM CLI: See Section 3.1.3, "Monitoring System Components Using the SP CLI" on page 3-9.

■ Use the internal Fault Indicator LEDs: See the next section, Troubleshooting Using the Internal Fault Indicator LEDs.

## 3.3.1     Troubleshooting Using the Internal Fault Indicator LEDs

The Sun Blade X6450 server module has internal Fault Indicator LEDs for each DIMM slot and each CPU. When the external front panel Service Action Required LED is on or blinking, you can eject the server module from the chassis, remove the cover, and press the internal Remind button to blink the internal Fault Indicator LED for the failed component(s). This allows you to identify the specific CPU or DIMM that is in a fault state.

**Note –** The internal fault indicator system is powered by a capacitor. Therefore, once you remove the server module from the chassis, the server module has a limited operational timeframe.

## ▼ To Troubleshoot Using the Internal Fault Indicator LEDs

1. **Place the server in standby power mode.**

   The Power/OK LED blinks when the server is in standby mode.

2. **Remove the server from the chassis (see** "To Remove the Server Module From the Chassis" on page 3-13**).**

   Set the server on an anti-static surface.

3. **Remove the top cover of the server module (see** "To Remove the Main Cover" on page 3-15**).**

4. **Locate the blue Remind button on the motherboard (see** FIGURE 3-6**).**

5. **Press the Remind button.**

   If a DIMM or CPU has a fault, its LED will blink. See FIGURE 3-6 for the location of the internal Fault Indicator LEDs. Each LED has two states: blinking or off (see TABLE 3-7).

**Note –** The Remind button charging circuitry can maintain operation for 30 - 45 minutes. To recharge the circuit, insert the server module in the chassis for approximately 5 minutes.

**FIGURE 3-6** CPU and DIMM Fault Reminder LEDs
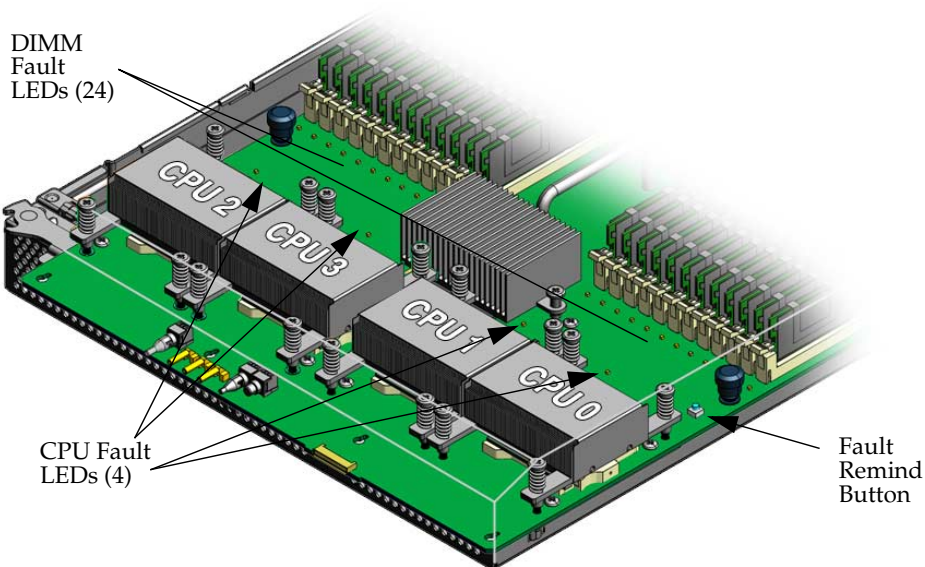


**TABLE 3-7** Internal LED Functions

| LED Name | Description |
|----------|-------------|
| DIMM Fault LED | This LED has two states:<br>• Off: DIMM is operating properly.<br>• Blinking (amber): The system has detected a fault with the DIMM. |
| CPU Fault LED | This LED has two states:<br>• Off: CPU is operating properly.<br>• Blinking (amber): The system has detected a fault with the CPU |

6. **If necessary, see the following removal and replacement procedure for the CPU or DIMM:**

   ■ Section 3.4.3, "Replacing DIMMs (CRU)" on page 3-24

   ■ Section 3.4.4, "Replacing a CPU and Heatsink (FRU)" on page 3-28

# 3.4    Replaceable Component Procedures

FIGURE 1-2 in Chapter 1 shows the locations of the replaceable components that are documented in this chapter.

---

**Note –** Some of the procedures in this section are for customer-replaceable units (CRUs) and some are for field-replaceable units (FRUs), as noted in the procedures and in the list below. FRU components should be replaced *only* by trained service technicians. Contact your Sun Service representative for assistance with FRU replacements.

---

This section contains the following component replacement procedures:

- Section 3.4.1, "Replacing the System Battery (CRU)" on page 3-21 (CRU)
- Section 3.4.2, "Replacing the Compact Flash Card (CRU)" on page 3-22 (CRU)
- Section 3.4.3, "Replacing DIMMs (CRU)" on page 3-24 (CRU)
- Section 3.4.4, "Replacing a CPU and Heatsink (FRU)" on page 3-28 (FRU)
- Section 3.4.5, "Installing and Removing a RAID Expansion Module" on page 3-32 (FRU)
- Section 3.4.6, "Installing and Replacing a Fabric Expansion Module" on page 3-40
- Section 3.4.7, "Installing or Replacing an Optional Solid-State Drive (SSD) (FRU)" on page 3-44
- Section 3.4.8, "Replacing the Motherboard (FRU)" on page 3-50

---

**Caution –** Before handling components, attach an ESD wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards contain components that are extremely sensitive to static electricity.

---

## 3.4.1    Replacing the System Battery (CRU)

The system battery is a customer replaceable unit (CRU). It is located on the motherboard. If an optional RAID Expansion Module is installed, you must remove the card to access the battery.

### ▼ To Replace the System Battery

1. **Power off the server module, and remove the server module from the chassis (see** "To Remove the Server Module From the Chassis" on page 3-13**).**

⚠ **Caution –** Possible chassis shutdown. Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **If a RAID expansion module (REM) card is present, remove the card (**see "To Remove a RAID Expansion Module" on page 3-38**).**

   The system battery is located on the motherboard (see FIGURE 3-7).

4. **Remove the battery by gently pulling the clip away from the edge of the battery and lifting the battery straight up. See** FIGURE 3-7**.**

**FIGURE 3-7**   Removing the Battery
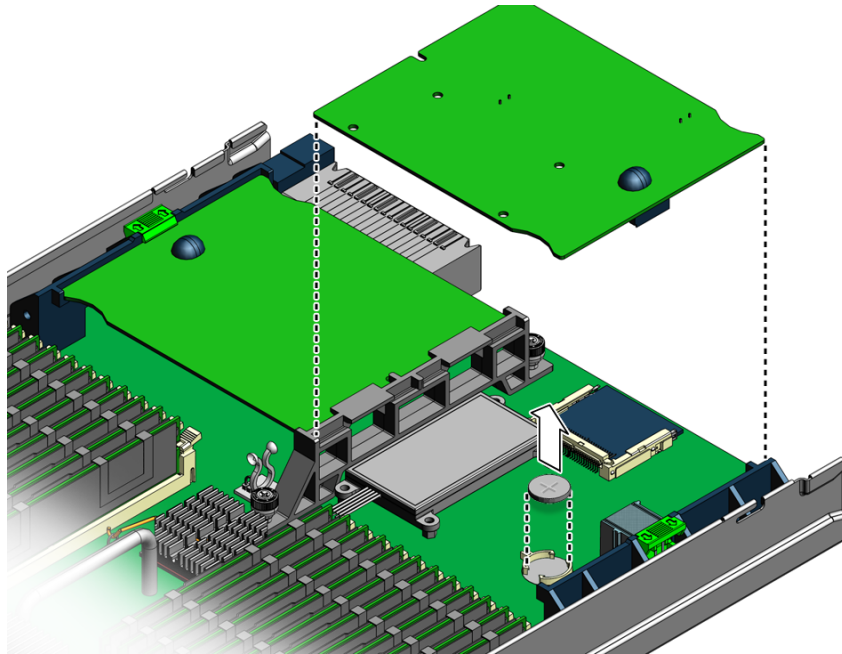


**5. To install the battery, reverse** Step 1 **through** Step 4**.**

---

**Note –** Install the new battery in the holder with the same orientation (polarity) as the battery that you removed. The positive polarity, marked with a "+" symbol, faces upward.

---

**6. Install the server module cover, and insert the server module into the chassis (see** Section 3.2.3, "Preparing the Server Module for Service" on page 3-13**).**

## 3.4.2   Replacing the Compact Flash Card (CRU)

The compact flash card is located on the motherboard and accessible from the rear of the server module.

## ▼ To Replace the Compact Flash Card

**1. If necessary, back up any data that is contained on the compact flash (CF) card.**

2. **Power off the server and remove the server module from the chassis as described in** **.**

⚠ **Caution –** Possible chassis shutdown. Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

3. **Remove the main cover as described in** **.**

4. **Locate the CF card under the RAID Expansion Module at the back of the server module (see** FIGURE 3-8**).**

   Your server module might not have a RAID Expansion Module.

**Note –** If the optional RAID Expansion Module is installed, you do *not* need to remove the RAID Expansion Module to remove the CF card.

**FIGURE 3-8**   Replacing the Compact Flash
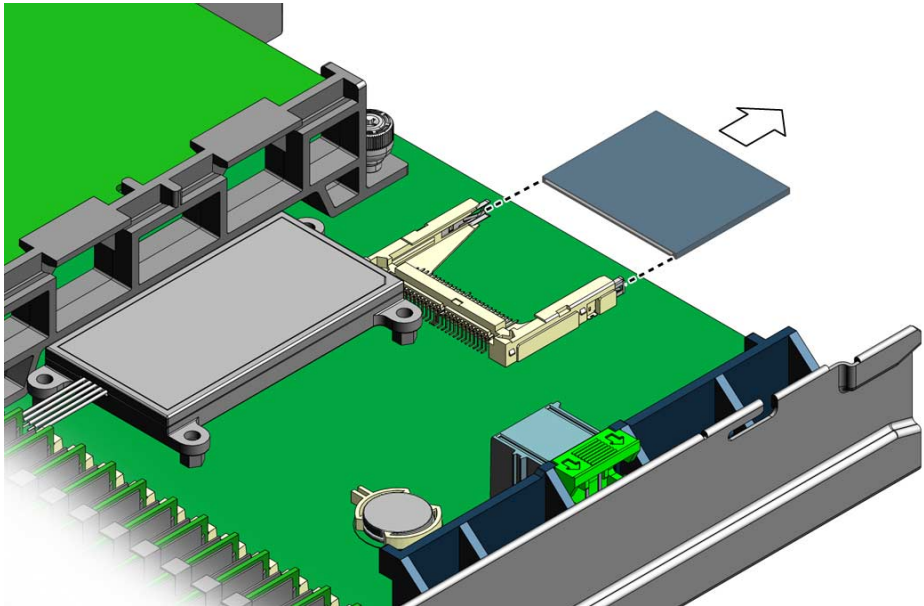


5. **Grasp the card, push down slightly, and pull card out.**

   Installation is the reverse of this procedure.

## 3.4.3    Replacing DIMMs (CRU)

This section describes how to replace DIMMs. It provides the rules for populating DIMM slots.

Before You Begin

■ For troubleshooting information, see Section 3.3, "Troubleshooting Server Issues" on page 3-17.

### 3.4.3.1    DIMM Population Rules

The DIMM population rules for the server module are listed here:

■ The server module can support a maximum of 24 DIMMs.

■ DIMM slots are paired.

■ DIMMs must be installed in pairs.

■ The slots for the first two pairs are blue; all others are black. For example, pairs A0 and B0 are blue, and pairs C0 and D0 are blue.

■ The two DIMMs within each pair must be identical (same manufacturer, size, and speed).

TABLE 3-8 shows the population rules based on the number of DIMMs.

**TABLE 3-8**    DIMM Slots and Locations

| Number of DIMMs | Slot Location | Number of DIMMs | Slot Location |
|---|---|---|---|
| 2 | A0, B0 | 14 | All of the above, plus: A3, B3 |
| 4 | All of the above, plus: C0, D0 | 16 | All of the above, plus: C3, D3 |
| 6 | All of the above, plus: A1, B1 | 18 | All of the above, plus: A4, B4 |
| 8 | All of the above, plus: C1, D1 | 20 | All of the above, plus: C4, D4 |
| 10 | All of the above, plus: A2, B2 | 22 | All of the above, plus: A5, B5 |
| 12 | All of the above, plus: C2, D2 | 24 | All of the above, plus: C5, D5 |

FIGURE 3-9 shows the DIMM numbering and positions

**FIGURE 3-9**   DIMM Numbering and Position
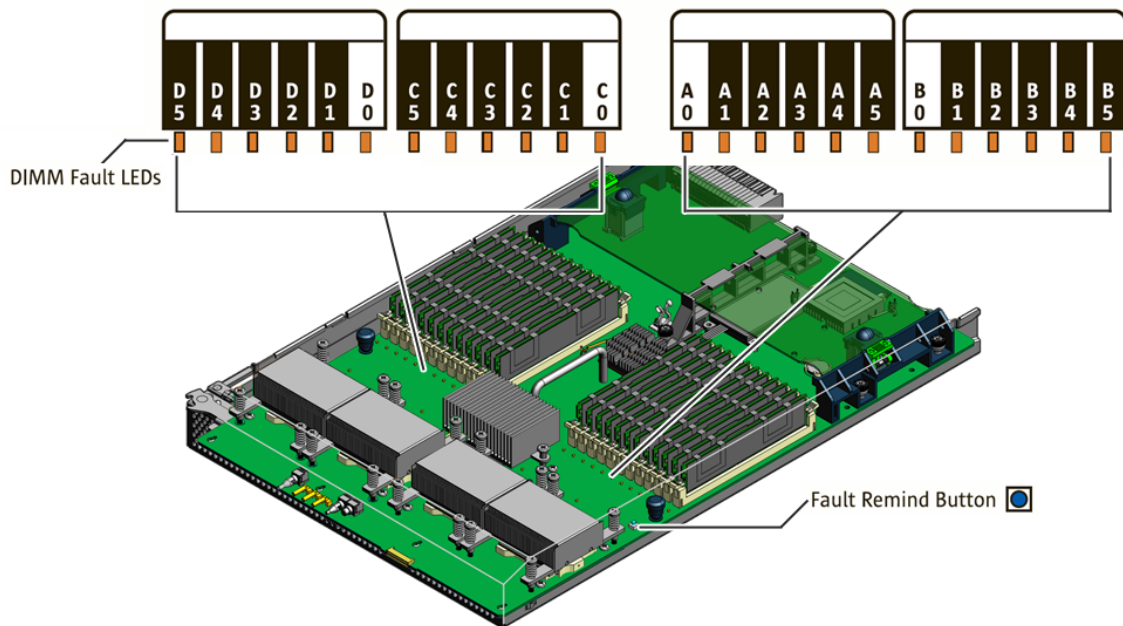


## ▼ To Replace a DIMM

**1. Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

⚠️ **Caution –** Possible chassis shutdown. Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

**2. Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

**3. Press the Remind button on the motherboard to blink the LED for the DIMMs that have failed (for the location of the Remind button, see** FIGURE 3-6**).**

4. **Locate the DIMM slot on the motherboard.**

   A lit LED next to a DIMM slot indicates a faulty DIMM:

   | If the... | Then... |
   |-----------|---------|
   | LED is off. | The DIMM is operating properly. |
   | LED is blinking (amber). | The DIMM is faulty and should be replaced. |

   Before continuing to the next step, review the guidelines in Section 3.4.3.1, "DIMM Population Rules" on page 3-24.

5. **To remove a DIMM:**

   a. **Rotate both DIMM slot ejectors outward as far as they will go.**

      This action partially ejects the DIMM from the slot.

   b. **Carefully lift the DIMM straight up to remove it from the slot** (see FIGURE 3-10).

**FIGURE 3-10** Removing a DIMM
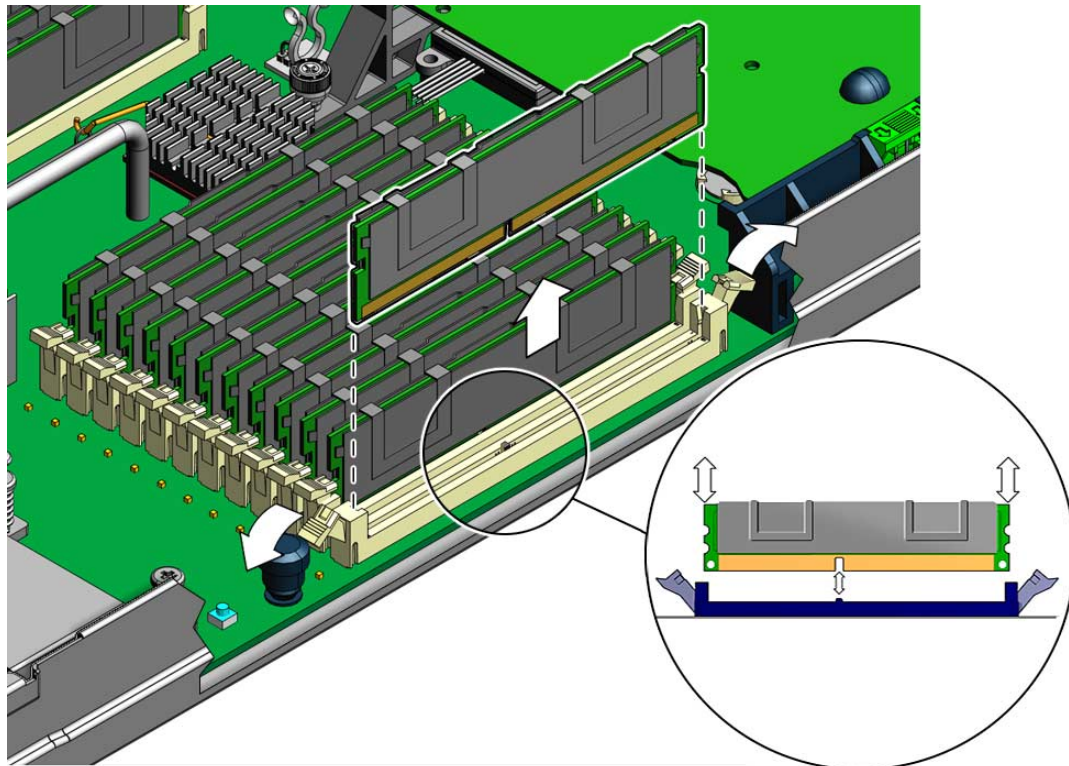
6. **To install a DIMM:**

   a. **Ensure that the DIMM slot ejectors at each end of the memory socket are fully open (rotated outward).**

   b. **Align the notch on the bottom edge of the DIMM with the key in the DIMM slot. See the inset in** FIGURE 3-11**.**

**FIGURE 3-11**  Installing a DIMM with Slot Alignment Key
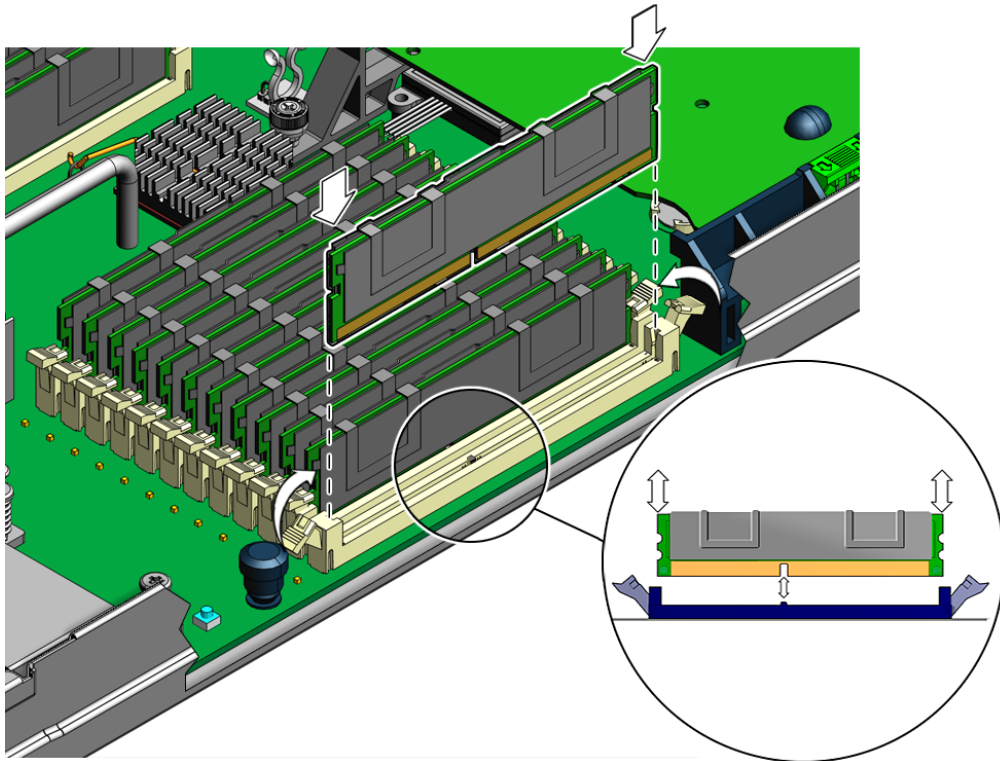


   c. **Press down evenly on both top corners of the DIMM until the ejectors rotate upward and snap into place. See** FIGURE 3-11**.**

7. **Install the server module main cover, and insert the server module into the chassis.**

8. **Use the SP to verify and view DIMM component information. See the corresponding ELOM or ILOM documentation collection.**

## 3.4.4 Replacing a CPU and Heatsink (FRU)

Use this procedure to replace a CPU or a CPU and heatsink. To complete this procedure, you need to identify the failed CPU, remove the heatsink and CPU, and install the new components, taking care to apply a uniform layer of thermal compound on top of the CPU.

When replacing CPUs:

- Position CPU0 must always contain a CPU.

- Do not install CPUs of different speeds on the same motherboard.

## ▼ To Replace a CPU and Heatsink

1. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

⚠

**Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **Press the Remind button on the motherboard to blink the LED for the CPU that has failed (for the location of the Remind button, see** FIGURE 3-6**).**

4. **Identify which CPU and heatsink you are replacing.**

The numeric designation of the four CPUs in the server and the CPU fault LEDs are shown in FIGURE 3-12. There is a fault LED on the motherboard for each CPU:

**FIGURE 3-12** The Internal Numbering Designation of the CPUs and the CPU Fault LEDs
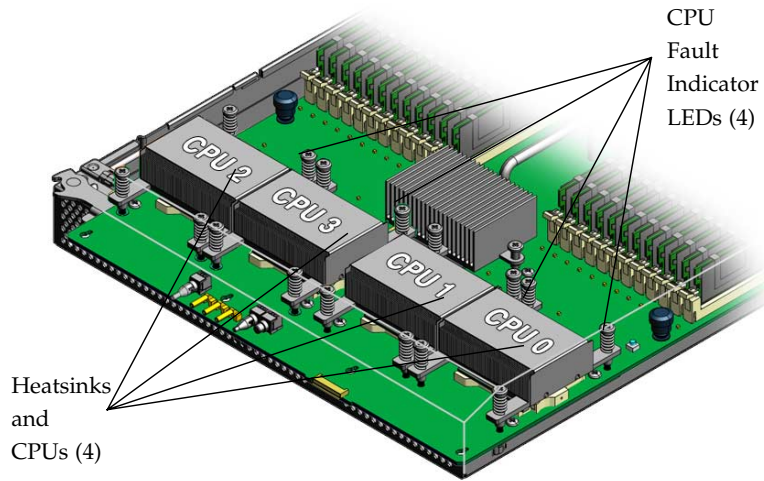


| If the... | Then... |
|---|---|
| LED is off. | The CPU is operating properly. |
| LED is blinking (amber). | The CPU has failed, and should be replaced. |

5. **To remove the heatsink from the motherboard:**

   a. **Gently press down on the top of the heatsink to counteract the pressure of the captive spring-loaded screws that secure the heatsink to the motherboard.**

   b. **Alternately loosen each of the four spring-loaded mounting screws that secure the heatsink to the motherboard.** See FIGURE 3-13.

   Turn each screw 180 degrees at a time.

**FIGURE 3-13** Removing the Heatsink and CPU
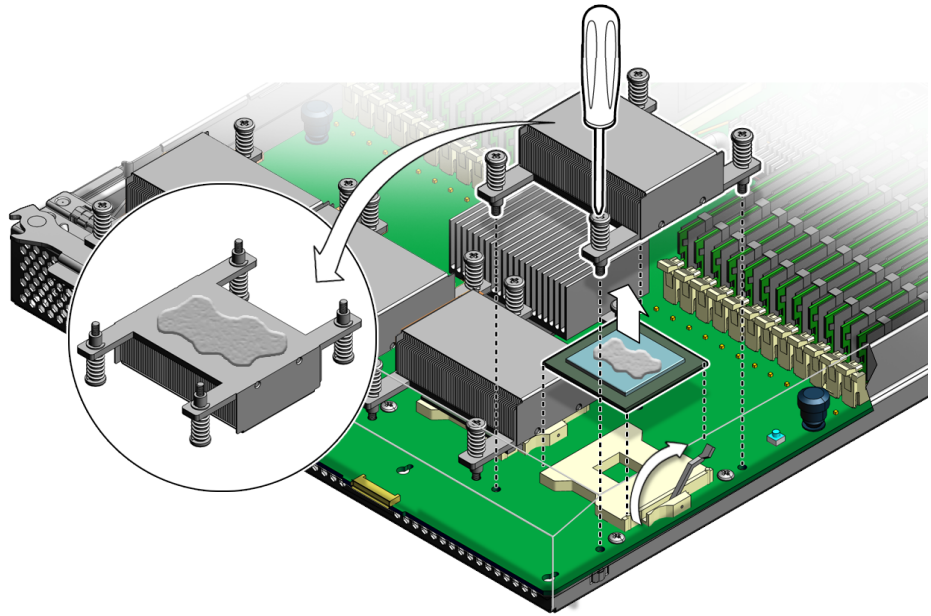


c. **To separate the heatsink from the top of the CPU, gently wiggle the heatsink left and right, while pulling upward.**

A thin layer of thermal compound separates the heatsink and the CPU. This compound also acts as an adhesive.

d. **When the heatsink separates from the CPU, set the heatsink aside.**

Do not allow the thermal compound to contaminate the work space or other components.

e. **If you are reinstalling the original CPU, use an alcohol pad and clean all of the old thermal compound from the component surface now, before you remove the CPU. You will need to apply new thermal compound when you reinstall the heat sink in** Step 8**.**

6. **To remove the CPU:**

a. **Lift the lever to the fully open position.**

b. **Lift the CPU out of the socket, leaving the lever in the open position.**

7. **To install the new CPU, or install the existing CPU:**

a. **Ensure that the CPU socket release lever is in the fully open position.**

**b. Align the CPU over the CPU socket.**

Use the triangle symbols on the CPU and the CPU socket for proper alignment.

> **Caution –** Possible irreparable damage to the CPU or motherboard from excessive downward pressure. Do *not* press down on the CPU. The CPU does not need to be forcibly seated in the socket. Downward pressure will damage the pins in the socket.

**c. Gently set the CPU on the socket.**

When properly aligned, the CPU sits flat in the CPU socket and has minimal side-to-side movement.

**d. When the CPU is in the socket, lower the release lever down and into the locked position, at the side of the socket.**

This action secures the CPU in the socket.

**8. To install the heat sink:**

**a. Using one syringe of thermal compound (500 mg [0.2 ml]), carefully apply the compound to the top of the CPU in an X pattern as shown in** FIGURE 3-14**.**

**FIGURE 3-14** Replacing the CPU
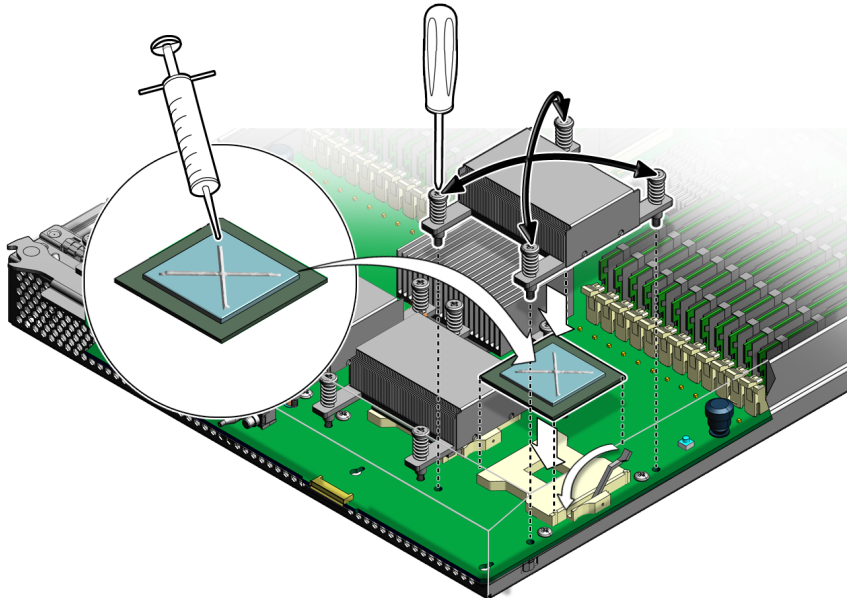


**b. If you are reinstalling an existing heatsink, use an alcohol pad to clean all the old thermal compound from the bottom surface of the heatsink. Also, clean any dust from the heatsink fins.**

c. **Carefully position heatsink over the CPU, and align the heatsink screws with the screw holes in the motherboard.**

! **Caution –** Possible component damage caused by heat. Avoid moving the heatsink after it has contacted the top of the CPU. Too much movement could disturb the layer of thermal compound, leading to ineffective heat dissipation and component damage.

d. **Lower the heatsink onto the CPU.**

e. **Gently press down on the top of the heatsink to counteract the pressure of the captive spring-loaded screws, and use a #2 screwdriver to alternately tighten the each screw, 180 degrees at a time, until tight (see** FIGURE 3-14**).**

**Note –** After replacing the CPU, you must update the BIOS and firmware, as described in Chapter 5, Updating ELOM Firmware.

## 3.4.5 Installing and Removing a RAID Expansion Module

This section describes how to add and remove a RAID expansion module (REM).

Your server module supports two types of RAID expansion modules:

■ Sun Blade RAID 5 Expansion Module

■ Sun Blade RAID 0/1 Expansion Module

! **Caution –** The Sun Blard RAID 5 expansion module includes a battery. The Sun Blade RAID 0/1 expansion module does not. If you are installing a Sun Blade RAID 5 expansion module, complete the steps that describe the installation and removal of the battery and cable. If you are installing a Sun Blade RAID 0/1 expansion module, ignore the steps that describe the installation or removal of the battery and cable.

**Note –** RAID expansion modules are installed in the right side bay, over the compact flash card socket and the system battery.

**Note –** If your system has a Solid State Drive (SSD), you cannot install a Sun Blade RAID 5 expansion module because the Sun Blade RAID 5 expansion module requires a separate battery, which is mounted on the MB using the same mounting hardware that is used for mounting the SSD.

### 3.4.5.1    Installing a RAID Expansion Module (CRU)

Use the following procedures to install a RAID Expansion Module (REM).

- If you are installing a Sun Blade RAID 5 expansion module, it includes a battery. Complete the steps in "To Install a Sun Blade RAID 5 Expansion Module Battery" on page 3-33.

- If you are installing a Sun Blade RAID 0/1 expansion module, go directly to"To Install a RAID Expansion Module" on page 3-35.

## ▼ To Install a Sun Blade RAID 5 Expansion Module Battery

**Note –** The Sun Blade REM includes a battery and four screws. The battery mounts on the motherboard under the RAID Expansion Module. The four screws secure the battery to the motherboard.

1. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

⚠️ **Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **Remove the RAID expansion module, battery, and battery mounting screws from the packaging.**

   The battery mounts on the motherboard under the RAID expansion module. The four screws secure the battery to the motherboard.

**Caution –** Irreparable hardware damage and component failure can occur due to overheating if battery is incorrectly installed. Do *not* mount the battery onto the RAID Expansion Module. Safe installation of the battery for the Sun Blade X6450 server module requires that you mount the battery on the motherboard as described in this procedure.

**4. Orient the battery with the connector and cable facing toward the front of the server (see** FIGURE 3-15**).**

**FIGURE 3-15**  Installing a RAID Expansion Module Battery
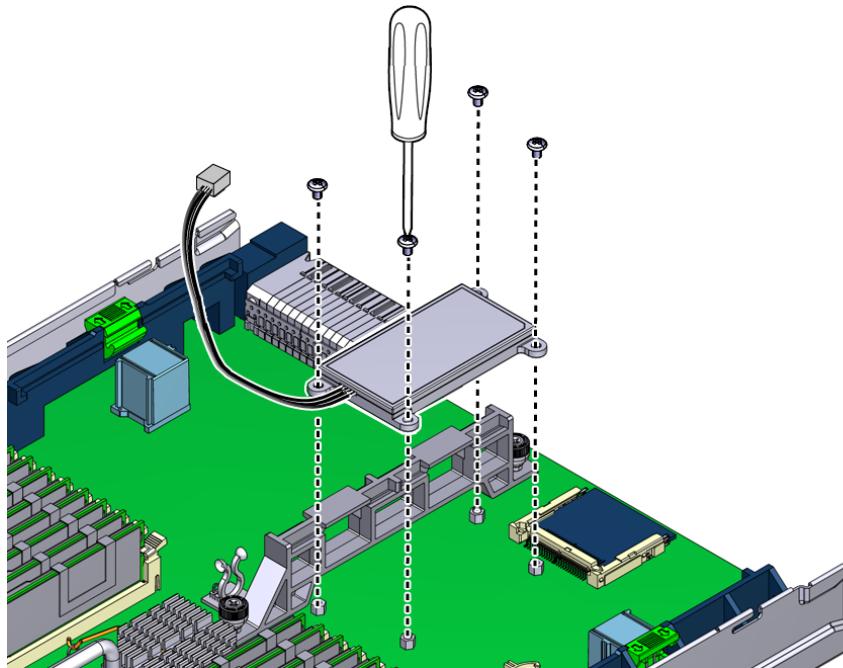


**5. Align the battery screw-hole flanges over the four screw hole stand-offs in the motherboard.**

**6. Use a #2 screwdriver and the four screws to secure the battery to the motherboard.**

**7. Secure the battery cable to the motherboard using the installed twist-lock.**

**8. Install the RAID expansion module as described in** "To Install a RAID Expansion Module" on page 3-35**. Be sure to complete the steps that describe how to connect and route the battery cable.**

# ▼ To Install a RAID Expansion Module

If you are installing a Sun Blade RAID 5 expansion module, install the battery, as described in "To Install a Sun Blade RAID 5 Expansion Module Battery" on page 3-33 before proceeding.

1. **If you have not already done so, prepare the system for servicing.**

   a. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13.

---

⚠️ **Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

---

   b. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15.

2. **Remove the cap from the RAID expansion module connector on the motherboard (see** FIGURE 3-16).

   The connector cap covers and protects the connector when a REM is not installed.

**FIGURE 3-16** Removing the Cap From the REM Connector
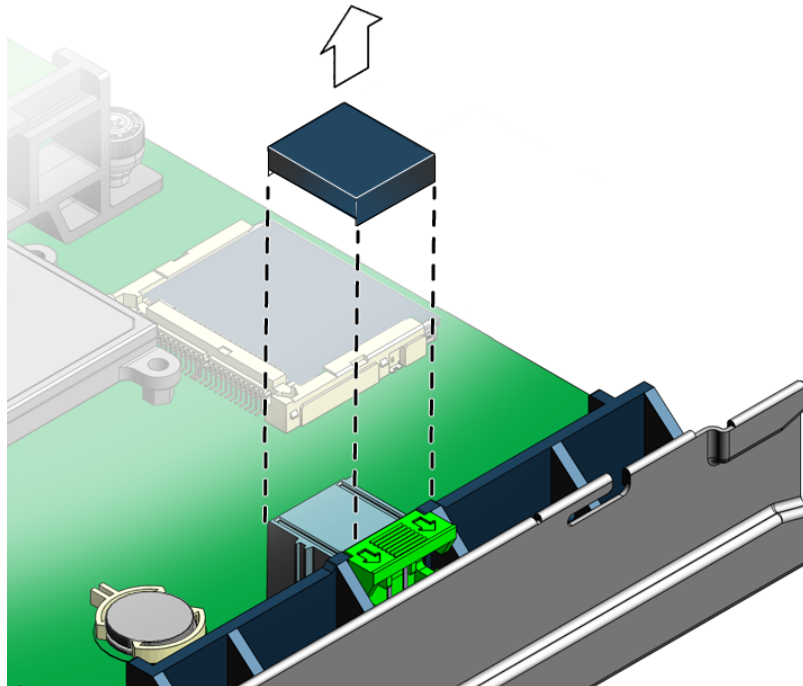
**3. Position the RAID expansion module with the connector and extension cable facing downward, aligning the connector on the card over the connector on the motherboard.**

---

**Note –** The Sun Blade RAID 0/1 expansion module does NOT have a cable.

---

**4. Connect and route the cable (Sun Blade RAID 5 expansion module only).**

If you are installing a Sun Blade RAID 0/1 raid expansion module, skip this step.

**a. (Connect the extension cable to the connector on the end of the battery cable (see** FIGURE 3-17**).**

---

⚠ **Caution –** Damage to the system can occur if the cable is improperly routed. Thermal issues require that you route the cable away from the battery, as described in this procedure.

---

**b. Route the cable through the opening in the center support bracket. See** FIGURE 3-17**.**

Because of thermal issues, cable routing is critical. Ensure that the cable is routed *away* from the battery and through the bracket opening nearest the center of the server.

**FIGURE 3-17** Routing the Cable and Installing the RAID Expansion Module
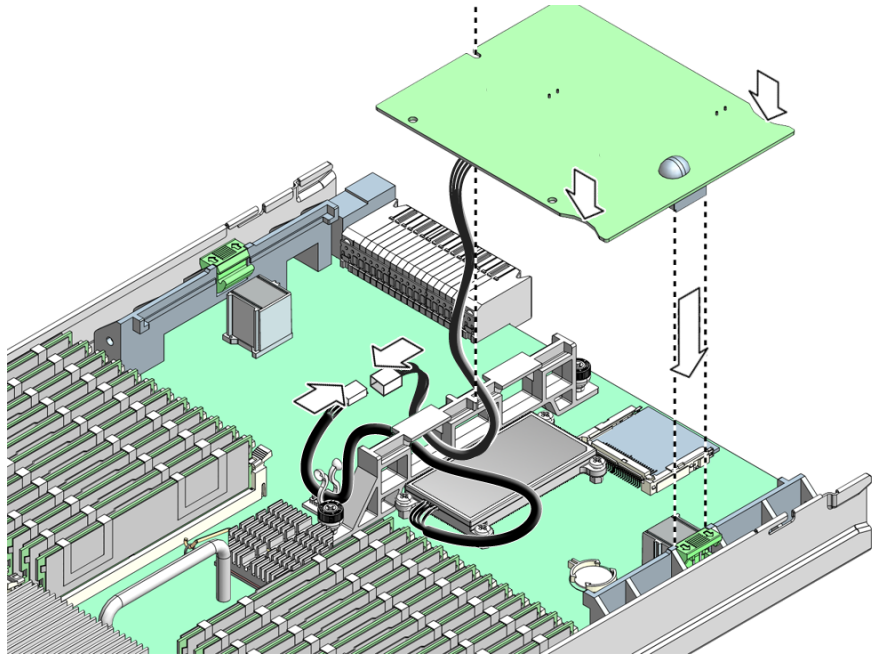


5. **Install the RAID Expansion Module:**

   a. **Slide the edge of the RAID Expansion Module into the clips on the support bracket.**

   b. **Press the card carefully down into the REM connector until the edge of the card is secured under the eject lever clip (see** FIGURE 3-17**).**

6. **Route and secure the cable (Sun Blade RAID 5 expansion module only).**

   a. **Gently pull as much of the cable as possible through the opening in the center support bracket**

   b. **Secure the cable in the cable twist-lock (see** FIGURE 3-17**).**

---

**Note –** For information about the implementation and configuration of RAID on this server, see the *Sun StorageTek RAID Manager Software User's Guide*, 820-1177 and the *Uniform Command-Line Interface User's Guide*, 820-2145.

---

If you replaced an existing RAID Expansion Module, you are done. If you are adding a RAID Expansion Module to a system that originally did not have one, see the following documents:

For information about configuring RAID on a Linux system, see:

■ *Sun Blade X6450 Server Module Operating System Installation Guide*

For information about configuring RAID on a Windows system, see:

■ *Sun Blade X6450 Server Module Windows Operating System Installation Guide*

## 3.4.5.2  Removing a RAID Expansion Module and Battery (CRU)

To remove a RAID expansion module and battery, or to remove only the battery, first remove the RAID expansion module and then remove the battery. The battery is mounted on the motherboard under the RAID expansion module. The removal process is described in following sections:

■ "To Remove a RAID Expansion Module" on page 3-38

■ "To Remove a Sun Blade RAID 5 Expansion Module Battery" on page 3-39

---

**Note –** The RAID expansion module battery should be replaced when indicated in the *Sun StorageTek RAID Manager Software User's Guide*, 820-1177.

---

## ▼ To Remove a RAID Expansion Module

1. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

---

⚠️ **Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

---

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **Disconnect the battery cable from the RAID expansion module extension cable (Sun Blade RAID 5 expansion module only).**

   The battery is mounted on the motherboard under the RAID expansion module. The cable is routed through the center support bracket and secured by a cable twist-lock. The battery cable connects to one end of the extension cable. The other end of the extension cable is connected to the RAID expansion module.

4. **To release the RAID expansion module, press down on the ejector lever (see** FIGURE 3-18**).**

**FIGURE 3-18**  Removing a RAID Expansion Module
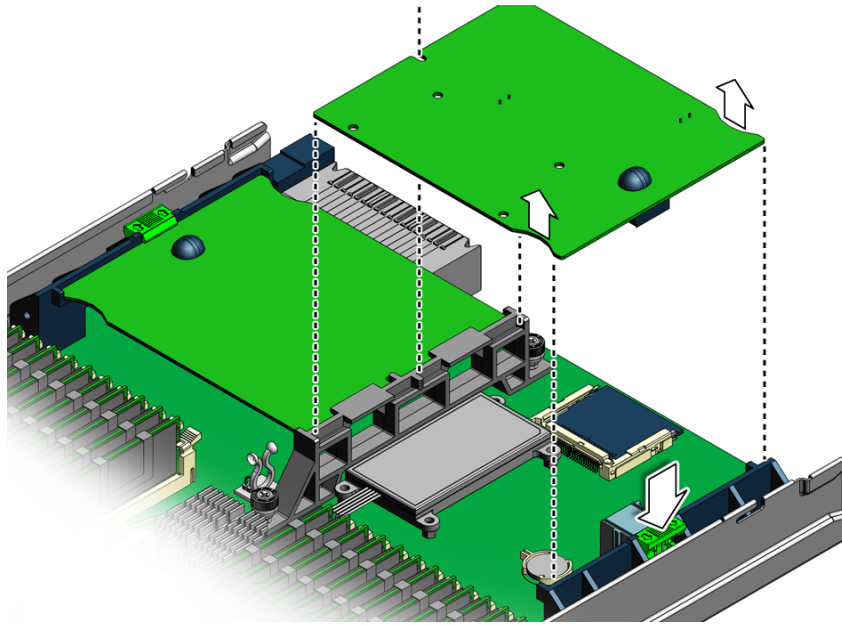


5. **To remove the RAID expansion module, grasp the edges of the card, nearest the ejector lever, and carefully lift, tilting the card upward slightly, until the card is free of the connector.**

   The other edge of the card is secured under the clips on the support bracket.

6. **When the card is disconnected, pull the card away from the support bracket.**

   To install a RAID expansion module, see "To Install a RAID Expansion Module" on page 3-35.

## ▼ To Remove a Sun Blade RAID 5 Expansion Module Battery

1. **Remove the RAID expansion module as described in the procedure,** "To Remove a RAID Expansion Module" on page 3-38**.**

2. **Use a #2 Phillips screwdriver to remove the four screws that secure the REM battery to the motherboard.**

3. **Lift and remove the battery.**

   To install a battery, see "To Install a Sun Blade RAID 5 Expansion Module Battery" on page 3-33.

**Caution –** Irreparable hardware damage and component failure can occur due to overheating if battery is incorrectly installed. Do *not* mount the battery onto the RAID expansion module. Safe installation of the battery for the Sun Blade X6450 server module requires that you mount the battery on the motherboard as described in the relevant procedure in this manual.

## 3.4.6 Installing and Replacing a Fabric Expansion Module

The procedures in this section describe how to install and remove a Fabric Expansion Module (FEM). The module is installed on the left side of the center mounting bracket.

## ▼ To Install a Fabric Expansion Module

1. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

**Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **Remove the protective cap from the fabric expansion module connector (see** FIGURE 3-19**).**

   The fabric expansion module connector is located on the left side of the center support bracket.

**FIGURE 3-19**  Removing the connector cap
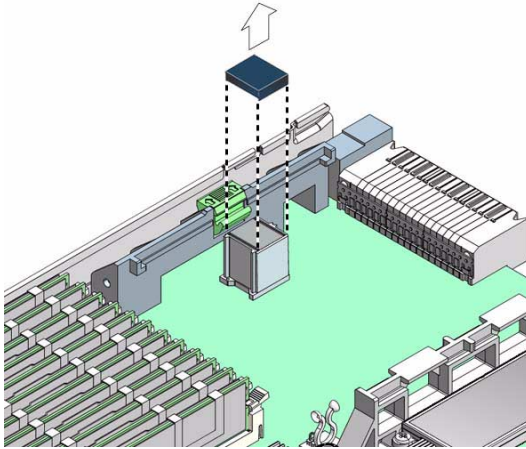


4. **Position the fabric expansion module (connector side down) over the fabric expansion module connector on the motherboard, and insert the (opposite) edge of the fabric expansion module into the slots on the center support bracket (see** FIGURE 3-20**).**

**FIGURE 3-20** Installation of a Fabric Expansion Module
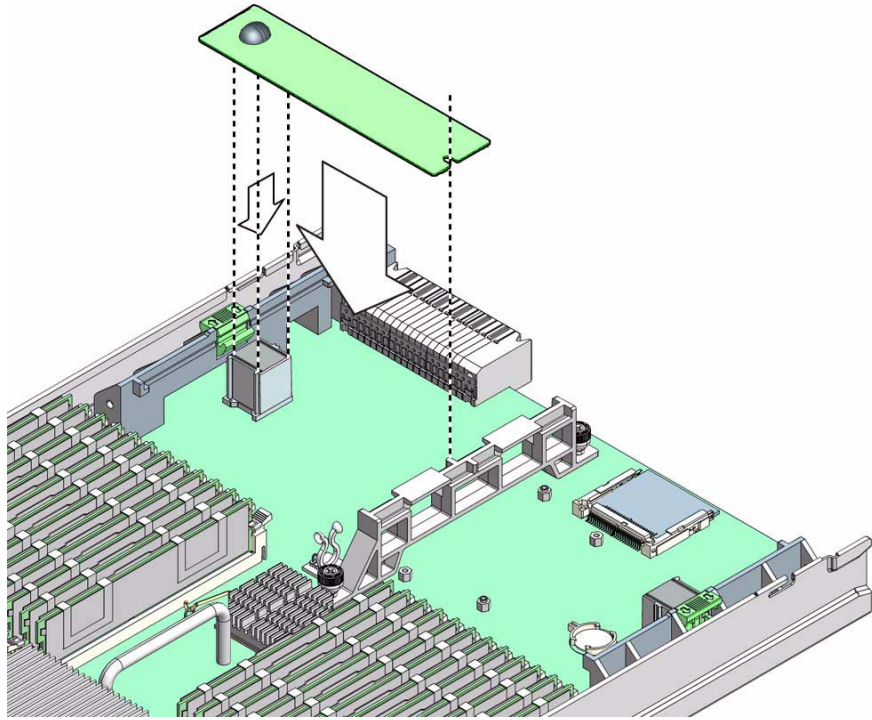


**5. Gently press the connector on the underside of the fabric expansion module onto the connector on the motherboard, until the edge of the board is secured by the ejector clip on the left-side support bracket.**

The fabric expansion module is installed.

## ▼ To Remove a Fabric Expansion Module

**1. Power off the server and remove the server module from the chassis as described in** **.**

⚠ **Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

   The fabric expansion module connector is located on the left side of the center support bracket.

3. **Press down on the ejector lever to unlock the edge of the fabric expansion module.**

   The ejector lever is located on the left-side support bracket. Unlocking the module allows you to disconnect the module from the motherboard.

4. **To disconnect, gently lift the edge of the module off the connector on the motherboard.**

   The other end of the module is secured under clips on the center support bracket (see FIGURE 3-21).

**FIGURE 3-21** Removing a Fabric Expansion Module
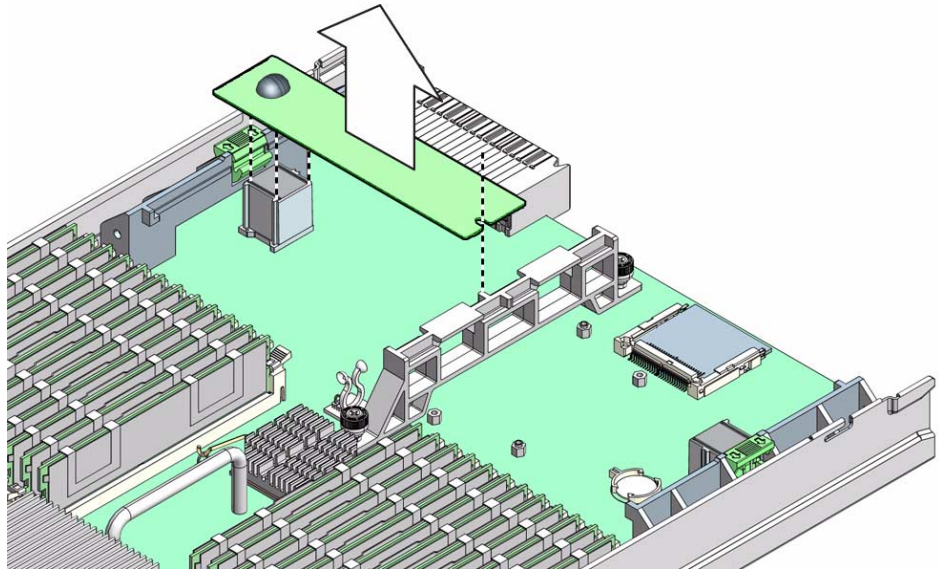


5. **When the module is disconnected, pull the card away from the center support bracket, and remove it from the server.**

## 3.4.7 Installing or Replacing an Optional Solid-State Drive (SSD) (FRU)

The procedures in this section describe how to install and replace the optional solid-state drive (SSD). The system supports a single SSD, which is installed in the right side bay near the compact flash socket and the system battery.

The SSD is connected to the motherboard (MB) and is controlled by the onboard SATA2. No additional controller hardware is required. The MB must be revision 2. For revision 2 information, see Section 1.4, "Identifying Sun Blade X6450 Server Module Revisions" on page 1-7.

---

**Note –** To use the optional SSD, your Sun Blade X6450 server module mother board must be revision 2 (rev. 2). For more information about SSD requirements and Rev. 2 motherboards see the *Sun Blade X6450 Server Module Product Notes*.

---

---

**Note –** Because the solid-state drive uses the same mounting hardware as the Sun Blade RAID 5 expansion module battery, you cannot install both the Sun Blade RAID Expansion Module *and* the SSD. For more information, see Section 3.4.7, "Installing or Replacing an Optional Solid-State Drive (SSD) (FRU)" on page 3-44.

---

If your server contains a Sun Blade RAID 5 expansion module, you *cannot* install the optional SSD, because the Sun Blade RAID 5 expansion module requires a separate battery, which is mounted on the MB using the same mounting hardware that is used for mounting the SSD.

If your system contains the optional Sun Blade RAID 0/1 Expansion module, you can install the SSD because this expansion module does not require a battery and the use of the mounting hardware.

### 3.4.7.1 Conditions for Provisioning SSDs

If the Sun Blade 6450 server module is configured to work with a Sun Blade 6000 Disk Module, the disks in the disk module operate as if they were actually on the Sun Blade X6450 server module. This means that:

- The disk module can contain SSD drives and other types of drives.

SSDs must meet the following conditions.

- You cannot mix SSD and other disk drives in a single RAID volume.
- You cannot mix SAS SSD and SATA SSD drives in a single RAID volume.

- You CAN create multiple volumes where each volume contains a different type of disk drives.

- NO mixing of SAS SSD and SATA SSD in a single RAID volume is allowed. For example, one volume could contain SAS SSD drives, and the other could contain SATA SSD drives.

- When drives are hot plugged, or when a drive fails and a hot spare is activated, the firmware determines that the new drive meets the above conditions before integrating it into the array.

### 3.4.7.2 Installing an Optional Solid State Drive

This section describes how to install an SSD. To do this, you must first remove any installed optional expansion modules. For example, if your server contains a Sun Blade RAID Expansion Module and a Sun Blade 10 GigabitEthernet Multi-Fabric Network Express Module, remove these first to access mounting hardware and connectors on the motherboard.

The SSD is installed in a bracket that is mounted to the motherboard, in the right side bay, underneath the optional Sun Blade RAID Expansion Module. Before you install the SSD mounting bracket, you must first route the SATA/power cable assembly through the center support bracket. One end of the cable attaches to connectors on the left side bay, underneath the optional Sun Blade 10 GigabitEthernet Multi-Fabric Network Express Module, which must be removed.

## ▼ To Install an Optional Solid State Drive

1. **Verify that your server module is the correct revision.**

   The server module must be revision 2 or newer.

2. **Verify that your server module contains the appropriate BIOS and SP (for more information, see the** *Sun Blade X6450 Server Module Product Notes***).**

3. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13.

---

**Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

---

4. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15.

5. **If necessary, remove and retain the optional RAID expansion module (see** "To Remove a RAID Expansion Module" on page 3-38**).**

6. **If necessary, remove and retain the optional fabric expansion module (see** "To Remove a Fabric Expansion Module" on page 3-42**).**

7. **Remove the cable, the SSD mounting bracket, the SSD, and the two packets of screws from the packaging.**

   The SSD packaging contains two sets of screws, one set of (shorter) M3 x 4.5L screws, which are used to fasten the SSD mounting bracket to the motherboard and one set of (longer) M2.5 x 5L screws, which are used to fasten the SSD to the SSD mounting bracket.

8. **Route the cable through the large rear-most opening in the center support bracket so that the end of the cable with two connectors is on the left side of the bracket (see** FIGURE 3-22**).**

   The two ends attach to connections on the left side of the motherboard.

9. **Press the larger of the two cable ends (SATA data) into the black connector on the motherboard labeled "SATA" (see** FIGURE 3-22**).**

   The connection is keyed for proper installation.

10. **Press the other end of the cable (SSD power) into the white connector labeled JP5 (see** FIGURE 3-22**).**

**FIGURE 3-22**  SSD Cable Routing and Connectors
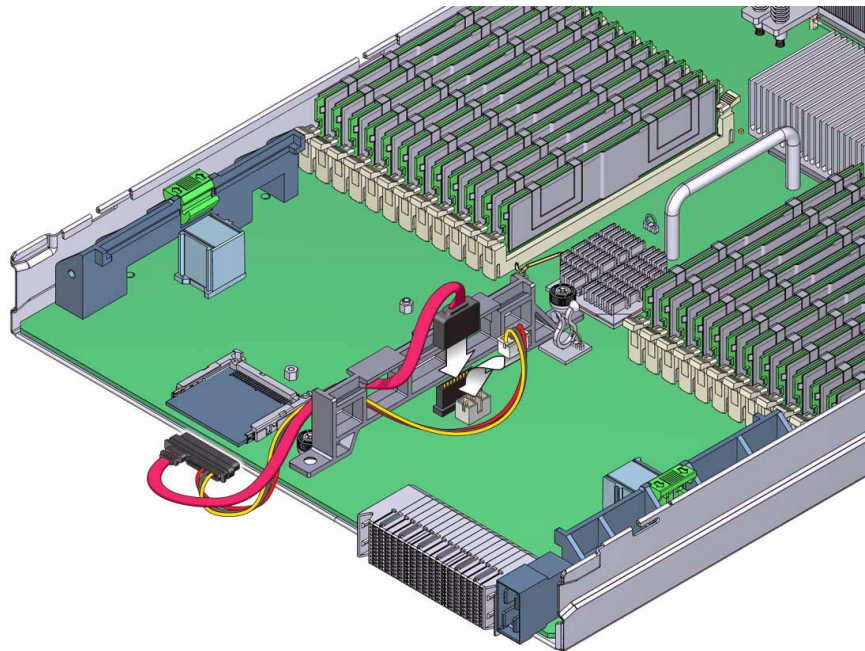
11. **Take up any slack in the cable by *gently* pulling the excess cable through the center support bracket and towards the right side.**

    Do *not* place any strain on the motherboard connectors.

12. **Position the four holes in the SSD mounting bracket over the four threaded standoffs on the motherboard so that the open end of the mounting bracket is toward the rear of the server (see** FIGURE 3-23**).**

    The four standoffs are located on the right side of the center support bracket.

**FIGURE 3-23**  Installation of the SSD Mounting Bracket
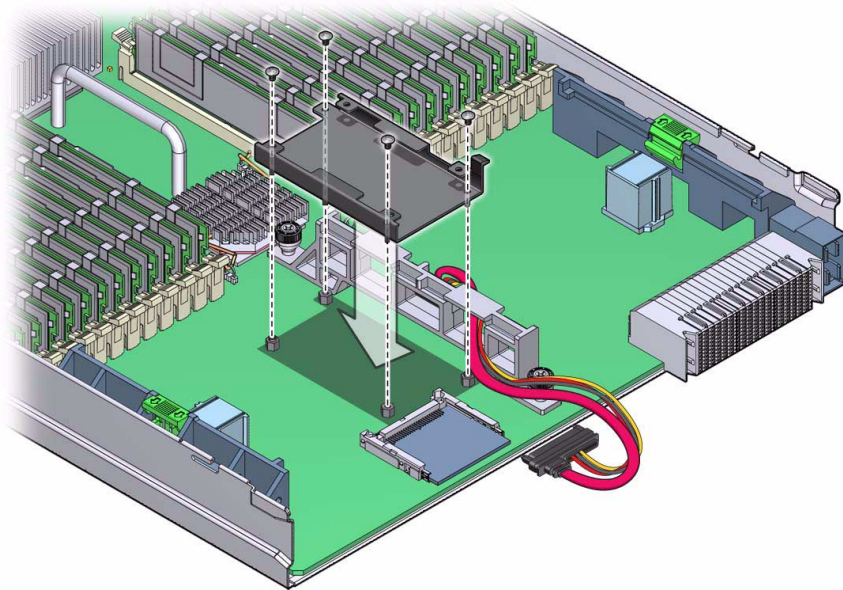


The mounting bracket has a cable retaining flange, which is used to hold the cable in place against the center support bracket.

13. **Position the cable behind the retaining flange on the mounting bracket (see** FIGURE 3-23**).**

    The flange must hold the cable against the center support bracket.

**FIGURE 3-24**  Installation of the SSD



Cable-Retaining
Flange
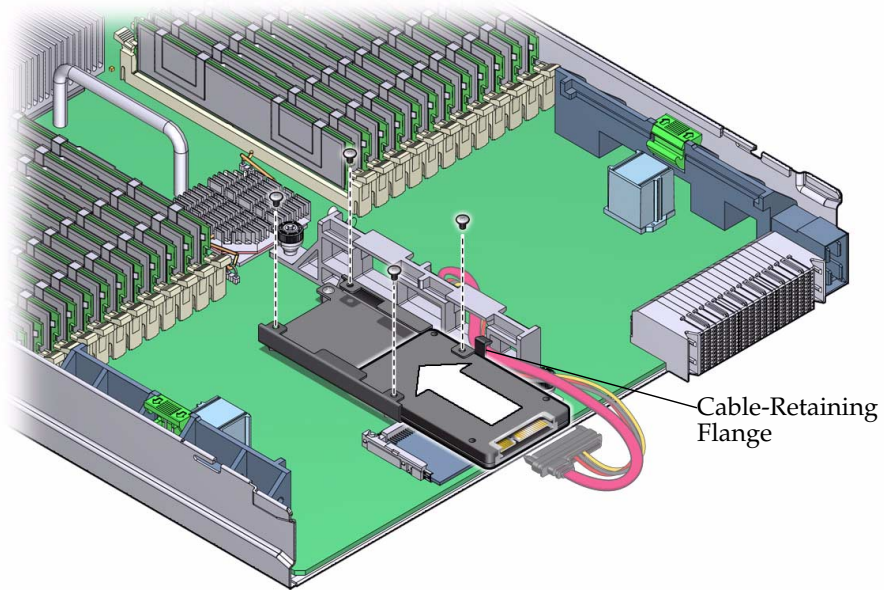
14. **Using a #2 screwdriver and the four *shorter* screws (M2.5 x 4.5L), fasten the mounting bracket to the threaded standoffs on the motherboard.**

    You must use the *shorter* (M2.5 x 4.5L) screws. Take care that the cable does not slip away from the retaining flange.

15. **Insert the SSD into the mounting bracket so that the screw holes in the SSD face upward (see** FIGURE 3-24**).**

16. **Align the four screw holes in the SSD with the four holes in the mounting bracket, and fasten the SSD to the mounting bracket using the four remaining (longer) screws (see** FIGURE 3-24**).**

    Use the longer (M2.5 x 5L) screws.

17. **Attach the cable to the SSD connector (see** FIGURE 3-24**).**

    The connector is keyed, so there is only one way to attach the connector correctly.

18. **If necessary, install the optional Sun Blade RAID Expansion Module (see** "To Install a RAID Expansion Module" on page 3-35**).**

19. **If necessary, install the optional fabric expansion module (see** "To Install a Fabric Expansion Module" on page 3-40**).**

    You might need to position the SSD power and SATA cables to limit contact with the underside of the expansion module.

## ▼ To Replace an Optional Solid State Drive

1. **Power off the server and remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13**.**

⚠️ **Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

2. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15**.**

3. **If necessary, remove the Sun Blade RAID Expansion Module (**"To Remove a RAID Expansion Module" on page 3-38**).**

4. **Disconnect the cable from the SSD (see** FIGURE 3-25**).**

**FIGURE 3-25**  Removal of the SSD Cable
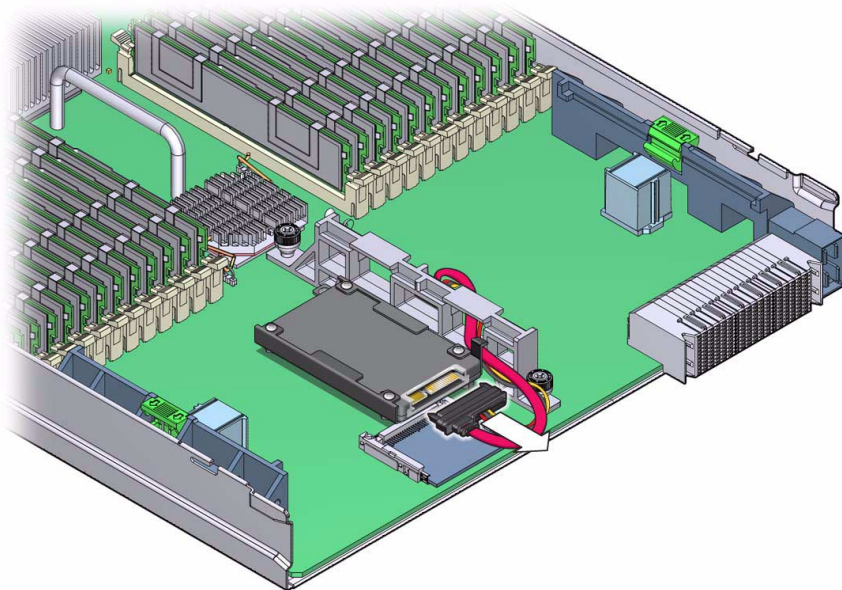


5. **Use a #2 Phillips screwdriver to remove the four screws securing the SSD to the SSD mounting bracket.**

**FIGURE 3-26**  Removal of the SSD
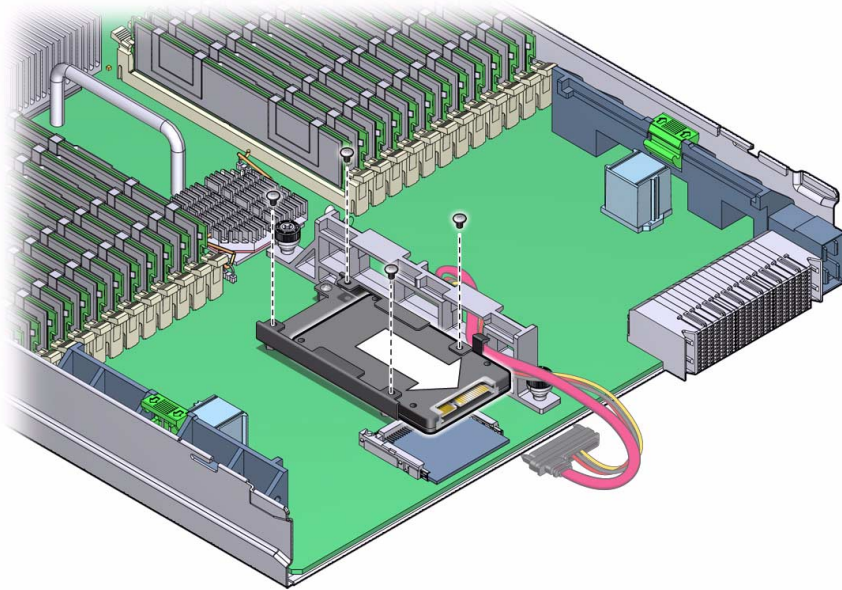


6. **To remove the SSD, slide it out of the mounting bracket.**

7. **Slide the replacement SSD into the mounting bracket so that the screw holes in the SSD face upward.**

8. **Align the four screw holes in the SSD with four holes in the mounting bracket and secure the SSD to the mounting bracket using the four screws.**

9. **Attach the cable to the SSD.**

   The cable is keyed for correct installation.

10. **If necessary, install the Sun Blade RAID Expansion Module (see** "To Install a RAID Expansion Module" on page 3-35**).**

## 3.4.8    Replacing the Motherboard (FRU)

The motherboard is shipped installed in a server module enclosure. Do *not* remove the motherboard from the enclosure. Instead, remove components from the old motherboard and enclosure assembly, and install these components into the new motherboard and enclosure assembly.

**Note –** The motherboard is an FRU and must be replaced *only* by qualified service technicians. Contact your Sun Service representative for assistance.

## ▼ To Replace the Motherboard

1. **Power off the server as described in** "To Monitor the System and Components Using the SP Web Interface" on page 3-5.

2. **Remove the server module from the chassis as described in** "To Remove the Server Module From the Chassis" on page 3-13.

**Caution –** Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shutdown.

3. **Remove the main cover as described in** "To Remove the Main Cover" on page 3-15.

4. **Use the following procedures to remove components from the motherboard and install the components on the new motherboard.**

   - DIMMS – See Section 3.4.3, "Replacing DIMMs (CRU)" on page 3-24.
   - CPU and heatsink – See Section 3.4.4, "Replacing a CPU and Heatsink (FRU)" on page 3-28.
   - RAID expansion module – See Section 3.4.5, "Installing and Removing a RAID Expansion Module" on page 3-32.
   - Solid State Drive - Section 3.4.7, "Installing or Replacing an Optional Solid-State Drive (SSD) (FRU)" on page 3-44.
   - Fabric expansion module - Section 3.4.6, "Installing and Replacing a Fabric Expansion Module" on page 3-40.
   - Compact flash card - Section 3.4.2, "Replacing the Compact Flash Card (CRU)" on page 3-22.

5. **When the components are installed in the new motherboard, install the cover on the server module, and insert the server module into the chassis (see** Section 3.2.3, "Preparing the Server Module for Service" on page 3-13**).**

# Performing Diagnostic Tests

This chapter describes how to use the Pc-Check diagnostic tests, provided on the Embedded Lights Out Manager (ELOM). If you are having a problem with your system, use the diagnostics to diagnose and solve it.

This chapter contains the following sections:

## 4.1 Pc-Check Diagnostics Overview

The Pc-Check diagnostics can test and detect problems on all motherboard components, drives, ports, and slots. This program can be accessed and executed only from ELOM.

Normally, if you encounter any hardware-related error message (such as memory errors or hard disk errors) on your workstation, you will run one of the following selections from the Diagnostics main menu:

- Use *Immediate Burn-In Test* to run a test script. Sun provides three diagnostic scripts designed to test a full range of system resources.

- Use *Advanced Diagnostics Test* to test a specific hardware component, for example, a CPU or a hard disk.

Other selections on the Diagnostics main menu display information about the system, create disk partitions, and display test results.

## ▼ To Access the Pc-Check Diagnostics

1. **Shut down the server.**

   For instructions, see Section 2.2, "Powering Off the Server" on page 2-4.

2. **Start the SP and access the web interface.**

   See the corresponding SP documentation collection for details.

3. **Configure the PCCheck program. This configures how Pc-Check runs when the SP is booted.**

   - For ELOM:

   a. **From the main menu, click the Remote Control tab and the Remote Power Control tab.**

   b. **From the drop-down menu select the option to Boot from PCCheck.**

   c. **Click Submit.**

   - For ILOM:

   a. **From the main menu, click the Remote Control tab and the Diagnostics tab**

   b. **Select the Manual option from the drop-down menu.**

      The drop-down menu offers the following choices:

      - Disabled – Pc-Check doesn't run.

      - Enabled – Selects the abbreviated version, which takes about three minutes.

      - Extended – Selects the abbreviated version, which takes about 30 minutes.

      - Manual – Selects the manual version, which runs untill it is stopped by user intervention.

---

**Note –** Select the Manual option to complete this procedure.

---

   c. **Click Save.**

**4. Click the Redirection submenu tab.**

The Redirection screen appears.

**5. Click the Launch Redirection button.**

The Redirection screen appears.

**6. Power-cycle the server module as described in** "Powering Off the Server" on page 2-4.

If you selected the Manual option (ILOM) or Boot from PC-Check (ELOM), the system boots to the Pc-Check main menu, which offers the following selections:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-In Testing
- Deferred Burn-In Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About Pc-CHECK
- Exit

Use the arrow keys on the keyboard to navigate through the diagnostics software, the Enter key to select a menu item, and the ESC key to exit a menu. Navigation instructions appear at the bottom of each screen.

To test a specific hardware component, select "Advanced Diagnostics Test." See Section 4.3, "Advanced Diagnostics" on page 4-5 for details.

To run a test script, select "Immediate Burn-In Testing." Sun provides three scripts that include a full test of all possible devices (`full.tst`), a quick test of devices (`quick.tst`), and a test that requires no user interaction (`noinput.tst`). See Section 4.5.1, "Performing Immediate Burn-In Testing" on page 4-9 for details.

To create your own test script, select "Deferred Burn-In Testing." See Section 4.5.2, "Performing Deferred Burn-In Testing" on page 4-10 for details.

The following sections in this chapter describe the menu items and tests in detail.

## 4.2    System Information Menu

Clicking System Information in the Diagnostics main menu causes the System Information menu to appear. Select items in this menu to see detailed information.

TABLE 4-1 describes the selections in the System Information menu.

**TABLE 4-1** System Information Menu Options

| Option | Description |
|---|---|
| System Information Menu | Includes basic information about your system, motherboard, BIOS, processor, memory cache, drives, video, modem, network, buses, and ports. |
| Hardware ID Image Menu | Enables you to create an XML or .txt document showing your system's hardware ID. |
| System Management Info | Provides information about the BIOS type, system, motherboard, enclosure, processors, memory modules, cache, slots, system event log, memory array, memory devices, memory device mapped addresses, and system boot. |
| PCI Bus Info | Includes details about specific devices from pci-config space within the system, similar to the System Management Information section. |
| IDE Bus Info | Displays information about the IDE bus. |
| Interrupt Vectors | Displays a list of interrupt vectors. |
| IRQ Information | Shows hardware interrupt assignments. |
| Device Drivers | Shows device drivers loaded under Open DOS. |
| APM Information | Enables you to test and configure the Advanced Power Management (APM) capabilities of the system. You can choose to change the power state, view the power status, indicate CPU usage, get a power management event, or change the interface mode. |
| I/O Port Browser | Shows the I/O port assignment for the hardware devices on the system. |
| Memory Browser | Enables you to view the mapped memory for the entire system. |
| Sector Browser | Reads sector information from the hard disks sector by sector. |
| CPU Frequency Monitor | Tests the processor speed. |
| CMOS RAM Utilities | Shows the CMOS settings of the system. |
| Text File Editor | Opens a file editor. |
| Start-Up Options | Enables you to set up startup options for diagnostics testing. |

## 4.3　Advanced Diagnostics

Advanced Diagnostics are used to test an individual device on the system. Most of the selections on this menu display information about the corresponding devices, and then offer a menu of testing options. For example, to test CPU 0, you can select Advanced Diagnostics, and then select Processor, and then select CPU0.

**Note –** If you do not know which device to test, see Section 4.5, "Burn-In Testing" on page 4-8.

TABLE 4-2 gives the name and a brief description of the selections in the Advanced Diagnostics Tests menu.

**Note –** Some of the tests in TABLE 4-2 might be irrelevant for certain systems. Ignore any that are not relevant to your hardware configuration.

**TABLE 4-2**　Advanced Diagnostics Test Menu Options

| Option | Description |
| --- | --- |
| Processor | Displays information about the processors and includes a Processor Tests menu. |
| Memory | Displays information about the memory, and includes tests for the different types of system memory. |
| Motherboard | Displays information about the motherboard, and includes a Motherboard Tests menu. |
| Floppy Disks | Not relevant. |
| Hard Disks | Displays information about the hard disk and includes a Hard Disk Tests menu. |
| | Refer to Section 4.4, "Hard Disk Testing" on page 4-6, for detailed information about scripts and about testing hard disks. |
| CD-ROM/DVD | Displays a CD-ROM/DVD menu to test DVD devices on the system. |
| ATAPI Devices | Displays information about devices attached to the IDE controllers on the system other than a DVD or hard disks (for example, zip drives). |
| ATA | Includes an ATA test menu. Select the parallel ATA driver to test. |

**TABLE 4-2** Advanced Diagnostics Test Menu Options *(Continued)*

| Option | Description |
|---|---|
| USB | Displays information about the USB devices on the system and includes a USB Tests menu. |
| Network | Performs network register controller tests. |
| System Stress Test | Exercises and checks the CPU, memory, and hard drive. |
| Keyboard | Includes a Keyboard Test menu with options for performing different tests on the keyboard. |
| Mouse | Displays information about the mouse and includes a menu to test the mouse on the system. |
| Audio | Displays information about the audio devices on the system and includes an Audio Tests menu to test audio device information. A PCI audio card is required to run this test. |
| Video | Displays information about the video card. Initially, the monitor might flicker, but then it brings up a Video Test Options menu that enables you to perform various video tests. |
| Firmware –ACPI | Displays information about Advanced Configurable Power Interface (ACPI) and includes an ACPI Tests menu. |

## 4.4   Hard Disk Testing

Use these tests to select and test a hard drive. Before starting the test, you can set the parameters using the Test Settings option.

## ▼ To Select and Test a Hard Drive

1. **From the main menu, choose Advanced Diagnostics Tests.**

2. **From the Advanced Diagnostics Tests menu, choose Hard Disks.**

3. **From the Select Drive menu, choose the hard disk you need to test.**

   The Hard Disk Diagnostics dialog opens. It displays information about the selected hard drive and the Hard Disk Tests menu, which includes the following options:

   ■ Select Drive

- Test Settings
- Read Test
- Read Verify Test
- Non-Destructive Write Test
- Destructive Write Test
- Mechanics Stress Test
- Internal Cache Test
- SMART Immediate Test
- View Error Log
- Utilities Menu
- Exit

**4. Click Select Drive to select a hard drive to test.**

**5. Click Test Settings, if desired, to select options for that test.**

This enables you to change the following parameters:

- Number of Retries

  Selects the number of times to retry testing a device before terminating the test.

- Maximum Errors

  Selects the number of errors allowed before terminating the test.

- Check SMART First

  Selects Smart Monitoring Analysis Reporting Test (SMART).

- HPA Protection

  Selects Host Protected Area (HPA) protection.

- Media Test Settings

  Selects the test time duration, the percentage of the hard disk to test, and the sectors to be tested on the hard disk.

- Device Test Settings

  Selects the test time durations of the devices and the test level.

**6. Select a test to begin execution.**

The Read Test, Read Verify Test, the Non-Destructive Write Test, and the Destructive Write Test test the actual media on the physical disk drive.

The Mechanics Stress Test and the Internal Cache Test test non media-related parts of the hard drive hardware.

**Caution –** Running the Destructive Write Test destroys any data on the disk.

# 4.5    Burn-In Testing

Burn-In testing enables you to run test scripts and to create new scripts.

The Diagnostics main menu provides two burn-in selections, Immediate Burn-In Testing and Deferred Burn-In Testing.

- Immediate Burn-In enables you to run an existing script and to select configuration options.

- Deferred Burn-In enables you to create a new script.

Sun provides three ready-made scripts designed to test the general health of the devices on your system. These scripts include:

- `quick.tst` – This script performs a series of tests that require the user to interact with the test software. When they require a user interaction, they stop and do not time out. These tests are faster than the `full.tst` but they are less thorough. For example, they do not run all the tests associated with a DIMM.

- `noinput.tst` – This script performs a non-detailed test of most hardware components, excluding those components that require user input (keyboard, mouse, sound, and video). This test does not require user input. It is normally the first test performed for hardware-related problems.

- `full.tst` – This script performs a detailed and comprehensive test on all hardware components, including those that require user input. It includes external port tests and requires loopback connectors on COM ports, parallel ports and USB ports. You must interact with the test utility to progress through these interactive tests.

---

**Tip –** Each of these scripts tests the operating status of your entire system. To test specific disk drives independently of the rest of the system, use the procedures in Section 4.4, "Hard Disk Testing" on page 4-6.

---

## 4.5.1 Performing Immediate Burn-In Testing

Use Immediate Burn-In Testing to run test scripts.

## ▼ To Perform Immediate Burn-in Testing

1. **From the Diagnostics main menu, select Immediate Burn-In Testing.**

   The screen displays a list of settings shown in TABLE 4-3 and a Burn-In menu.

2. **From the menu, select Load Burn-In Script.**

   A text box appears.

3. **Type the name of the script you want to run.**

   - `quick.tst, noinput.tst,` or `full.tst`

     *-or-*

   - If you have created and saved your own script, type `d:\`*testname*`.tst`

     where *testname* is the name of the script that you have created.

4. **To change any of the options, at the bottom of the screen, select Change Options.**

   This opens the Burn-In Options menu, which enables you to modify the options listed in TABLE 4-3 for the currently loaded test script.

5. **Select Perform Burn-In Tests.**

   The diagnostics software executes the test script as configured.

**TABLE 4-3**  Continuous Burn-In Testing Options

| Option | Default – General | Default Using `quick.tst,` `noinput.tst,` **or** `full.tst` **Script** | All Possible Choices |
|---|---|---|---|
| Pass Control | Overall Time | Overall Passes | Individual Passes, Overall Passes, or Overall Time |
| Duration | 01:00 | 1 | Enter any number to choose the time duration of the test |
| Script File | N/A | `quick.tst,` `noinput.tst,` or `full.tst` | `quick.tst,` `noiniput.tst,` or `full.tst` |
| Report File | None | None | User defined |

**TABLE 4-3**　Continuous Burn-In Testing Options *(Continued)*

| Option | Default – General | Default Using `quick.tst`, `noinput.tst`, **or** `full.tst` **Script** | All Possible Choices |
|---|---|---|---|
| Journal File | None | `D:\noinput.jrl`, `D:\quick.jrl`, or `D:\full.jrl` | User defined |
| Journal Options | Failed Tests | All Tests, Absent Devices, and Test Summary | Failed Tests, All Tests, Absent Devices, and Test Summary |
| Pause on Error | N | N | Y or N |
| Screen Display | Control Panel | Control Panel | Control Panel or Running Tests |
| POST Card | N | N | Y or N |
| Beep Codes | N | N | Y or N |
| Maximum Fails | Disabled | Disabled | 1–9999 |

## 4.5.2　Performing Deferred Burn-In Testing

Use Deferred Burn-In Testing to create scripts.

## ▼ To Perform Deferred Burn-in Testing

1. **From the Diagnostics main menu, select Deferred Burn-In Testing.**

   The screen displays a list of settings shown in TABLE 4-3 and a Burn-In menu.

2. **Use the menu to configure the following selections:**

   - Change Options

     Opens the Burn-In Options menu, which enables you to modify the options listed in TABLE 4-3 for the currently loaded test script.

   - Select Tests

     Opens a listing of the tests available for your workstation configuration and the currently loaded test script.

3. **When you are done, select Save Burn-In Script and type the name for the new script.**

   Enter `d:\`*testname*`.tst`

   Where *testname* is the name of the script that you have created.

4. **To run the newly created script, go to Immediate Burn-In Testing in** Section 4.5.1, "Performing Immediate Burn-In Testing" on page 4-9**, and run the script** *testname.***tst.**

## 4.6 Show Results Summary

Selecting Show Results Summary on the Diagnostics main menu displays the tests that have been run and lists the results, which can be Pass, Fail, or N/A.

The following list describes all the tests that are available with the Tools and Drivers CD. If your system does not have the corresponding option, the results will show as N/A in the Show Results Summary list.

- Processor

  This section shows the following tests conducted against the processor: Core Processor Tests, AMD 64-Bit Core Tests, Math Co-Processor Tests – Pentium Class FDIV and Pentium Class FIST, MMX Operation, 3DNow! Operation, SSE Instruction Set, SSE2 Instruction Set, and MP Symmetry.

- Motherboard

  This section shows the following tests conducted against the motherboard: DMA Controller Tests, System Timer Tests, Interrupt Test, Keyboard Controller Tests, PCI Bus Tests, and CMOS RAM/Clock Tests.

- Memory, Cache Memory, and Video Memory

  This section shows the following tests conducted against the various types of memory: Inversion Test Tree, Progressive Inv. Test, Chaotic Addressing Test, and Block Rotation Test.

- Input Device

  This section shows the following tests conducted against the input device: Verify Device, Keyboard Repeat, and Keyboard LEDs.

- Mouse

  This section shows the following tests conducted against the mouse: Buttons, Ballistics, Text Mode Positioning, Text Mode Area Redefine, Graphics Mode Positions, Graphics Area Redefine, and Graphics Cursor Redefine.

- Video

This section shows the following tests conducted against the video: Color Purity Test, True Color Test, Alignment Test, LCD Test, and Test Cord Test.

- ATAPI Devices

  This section shows the following tests conducted against ATAPI devices: Linear Read Test, Non-Destructive Write, and Random Read/Write Test.

- Hard Disk

  This section shows the following tests conducted against the hard disk: Read Test, Read Verify Test, Non-Destructive Write Test, Destructive Write Test, Mechanics Stress Test, and Internal Cache Test.

- USB

  This section shows the following tests conducted against the USB: Controller Tests and Functional Tests.

- Hardware ID

  The compare test is used to determine the machine ID for the system. This test is not available for the Sun Blade X6450 server module.

## 4.7 Print Results Report

The Print Results Report option enables you to print results of the diagnosis of your system.

Ensure that your workstation is connected to a printer, and then enter the required information to print the results.

## 4.8 About Pc-Check

The About Pc-Check window includes general information about the Pc-Check software, including resident and nonresident components, such as mouse devices.

## 4.9 Exit

The Exit option exits the Pc-Check software and reboots the server module.

# Updating ELOM Firmware

This chapter describes how to update the firmware on a Sun Blade X6450 server module equipped with an ELOM service processor. You can update firmware for the BIOS, the Service Processor (SP), the Command Programmable Logic Device (CPLD), and the RAID expansion module (REM) using procedures in this chapter.

To update the firmware on a server module equipped with an ILOM service processor:

■ For ILOM 2.0, see the *Sun Integrated Lights Out Manager 2.0 Supplement for Sun Blade X6450 Server Module*.

■ For ILOM 3.0, see the ILOM 3.0 documentation collection and the *Sun Integrated Lights Out Manager 3.0 Supplement for Sun Blade X6450 Server Module*.

## 5.1     Updating the BIOS, SP, CPLD and REM Firmware

This section contains procedures for updating your server firmware. You can update firmware using several different methods, including the web interface, the CLI, and a bootable USB device. These methods are described in the following section:

## 5.1.1 Updating the BIOS and the SP Firmware Using the ELOM Web Interface

The Embedded Lights Out Manager (ELOM) web interface offers an easy to use method for updating both the BIOS and SP firmware. For more information about using the web interface, see the *Sun Blade X6450 Server Module Embedded Lights Out Manager Administrative Guide.*

## ▼ To Update the BIOS and the SP Firmware Using the ELOM Web Interface

1. **Start your browser and go to:**

   http://www.sun.com/servers/blades/downloads.jsp

2. **Download the Tools and Drivers CD ISO image.**

3. **Use the Tools and Drivers CD ISO image file to burn a CD (or mount the ISO image).**

4. **Copy the combined firmware image file from the Tools and Drivers CD to a device that is accessible to your server.**

   Use the command: /firmware/bmc/x6450v#.rom

   where # is the file version number.

5. **In your browser's address bar, type the IP address of the SP.**

   For example:

   **http://**xxx.xxx.xxx.xxx

   Where xxx.xxx.xxx.xxx is the IP address of the SP.

   The ELOM web interface login screen appears.

6. **Log in as root or as a user account with administrator privileges.**

   The ELOM main screen appears.

7. **From the main menu, click the Remote Control tab.**

   The Remote Control submenu tabs appear.

8. **Click the Remote Power Control tab.**

   The Remote Power Control submenu screen appears.

9. **Select the Power Off radio button, and click the Submit button.**

   This action powers off the server.

10. **From the main menu, click Maintenance tab.**

    The Maintenance submenu tabs appear.

11. **Click the Firmware Upgrade tab.**

    The Firmware Upgrade screen appears.

12. **Click the Enter Firmware Upgrade Mode.**

13. **Locate the firmware upgrade file.**

    a. **Click Browse.**

    b. **Browse for the combined firmware image file that you copied in** Step 4.

    c. **Select the file then click Open.**

14. **If you want to save the current SP configuration, click the Save Configuration check box.**

15. **Click the Update firmware button to start the firmware upgrade.**

    The firmware upgrade process updates the BIOS and the ELOM firmware. After the upgrade is complete, the ELOM reboots and the web session is restarted. The BIOS version information is updated once the host is powered on.

## 5.1.2 Updating the BIOS and SP Firmware Using the Command-Line Interface (CLI)

You can use CLI to update the BIOS and SP firmware. Updating the firmware from the command-line you can update both the SP and the BIOS firmware at the same time, using the combined BIOS and SP (BMC) image on the *Sun Blade X6450 Server Module Tools and Drivers CD*. For more information about using the CLI, see the *Sun Blade X6450 Server Module Embedded Lights Out Manager Administrative Guide.*

## ▼ To Update the BIOS and SP Firmware Using the Command-Line Interface (CLI)

1. **Copy the combined BIOS/BMC image to your Tftp server.**

2. **If the server OS is running, perform a clean shutdown by using the OS-specific shutdown procedure.**

3. **Log in to the CLI, and navigate to the TftpUpdate directory. Enter:**

   ```
   -> cd /SP/TftpUpdate
   ```

**Note –** A network failure during the file upload will result in a timeout. This causes the SP to reboot with the prior version of the firmware.

4. **To set the IP address of the TFTP server, enter the following command:**

   -> **set ServerIP=***xxx.xxx.xxx.xxx*

   Where *xxx.xxx.xxx.xxx* is the IP address of the TFTP server.

5. **To set the file name of the combined** `bmc.bios` **image, enter the following command:**

   -> **set Filename=filename**

   a. **To set the update method to overwrite current BMC settings, enter:**

      -> **set SaveFlag=yes**

   b. **To set the update method to preserve current BMC settings, enter:**

      -> **set UpdateMethod=PreserveCMOS**

6. **Start the tftp download:**

   -> **set Update=action**

7. **Select Yes to continue, or select No to exit.**

   Example:

   ```
   -> cd /SP/TftpUpdate
   -> set ServerIP=xxx.xxx.xxx.xxx
   -> set FileName=filename
   -> set Update=action
   getting image...
   getting image successfully.
   prepare to update...
   Prepare OK!
   Update Successful
   starting update...
   ```

## 5.1.3 Updating the BIOS from a DOS-Bootable USB Disk

This procedure describes how to update the BIOS from a DOS-Bootable USB disk.

## ▼ To Update the BIOS From a DOS-Bootable USB Disk

1. **Copy the contents of the firmware/BIOS directory from the Tools and Drivers CD to DOS-bootable USB disk.**

2. **Attach the multi-port dongle cable to the UCP connector on the front of the server.**

3. **Connect the USB disk to dongle connector.**

4. **Press F8 and select this disk to boot DOS.**

5. **Navigate to the directory to where you copied the files in** Step 1.

6. **Run the following command:**

   *ver*#**.bat**

   Where *ver*# is the BIOS version.

7. **Reboot the system after the updating the BIOS.**

## 5.1.4     Updating the CPLD Using the ELOM Web Interface

The following procedure is rarely used, and should not be done unless instructed by Sun Service personnel. For more information about using the web interface, see the *Sun Blade X6450 Server Module Embedded Lights Out Manager Administrative Guide.*

## ▼ To Update CPLD Using the ELOM Web Interface

1. **Start your browser and download the Tools and Driver CD ISO image from:**

   http://www.sun.com/servers/blades/downloads.jsp.

2. **Burn a CD from the ISO image, or mount the ISO image.**

3. **On the CD or ISO image, locate the combined firmware image file:**

   /firmware/cpld/CPLD_V#.jbc

   Where **#** is the CPLD version number.

4. **Save the** CPLD_V#.jbc **file to a location on your hard drive.**

5. **Ensure that the host operating system is shut down.**

6. **In your browser's address bar, type the IP address of the SP.**

   For example:

   **http://**xxx.xxx.xxx.xxx

   Where xxx.xxx.xxx.xxx is the IP address of the SP.

   The ELOM web interface login screen appears.

7. **Log in as root or as a user account with administrator privileges.**

   The ELOM main screen appears.

8. **From the main menu, click Remote Power Control tab.**

   The Remote Power Control submenu screen appears.

9. **Click the Power Off radio button, and click Submit.**

10. **From the main menu, click the Maintenance tab.**

    The Maintenance submenu screen appears.

11. **Click Enter Upgrade Mode.**

12. **Click Browse and select the** CPLD_V#.jbc **file that you saved in** Step 4.

13. **Click the Upgrade CPLD button to start the upgrade process.**

14. **Wait until the upgrade is finished.**

15. **Remove and insert the server to allow the new CPLD to take effect.**

    You need to apply AC power to the server for the new CPLD to take effect.

## 5.1.5     Updating the REM Firmware

The following procedure describes how update the RAID expansion module (REM) firmware using a DOS-bootable USB flash drive. To perform this procedure, you will need:

- DOS-bootable USB flash drive
- A system with internet access, a USB connector, and (optional) a write-capable CD/DVD drive
- A blank CD-R or CD-RW disk (optional)
- Multi-port dongle cable
- A USB keyboard
- A monitor

You can also update the REM firmware using the procedures in the *Sun StorageTek RAID Software Manager User's Guide*.

# ▼ To Update the REM Firmware from a DOS-Bootable USB Thumb Drive

1. **On a system with internet access, download the Tools and Driver CD ISO image from:**

   http://www.sun.com/servers/blades/downloads.jsp

2. **Burn a CD or mount the ISO image.**

3. **Insert the DOS-bootable USB flash drive into the USB port.**

4. **On the CD or ISO image, go to the Adaptec firmware directory,** `firmware/REM/`.

5. **Copy all the files from the** `firmware/REM/directory` **to the DOS-bootable USB flash drive.**

6. **Remove the USB flash drive from the system.**

7. **Connect the multi-port dongle cable to the UCP connector on the front of the server module.**

8. **Attach a keyboard, a monitor, and the DOS-bootable USB flash drive to the multi-port dongle cable.**

9. **To boot the USB thumb drive to DOS:**

   a. **Restart the server module.**

      Watch the POST and boot messages for prompt to press F8 to enter BIOS.

   b. **When the BIOS F8 prompt appears, press F8.**

      After some messages, the software prompts you to select a boot device.

   c. **Select USB boot device, then press Enter.**

      The server module boots to DOS and displays the DOS prompt.

      `A:\>`

10. **From the DOS prompt, navigate to the directory where you copied the Adaptec files.**

11. **Execute the** `afu.exe` **file by entering the command:**

    **afu**

    The Adaptec Flash Utility window appears.

12. **Select Update the Flash Image, then press Enter.**

    The utility displays a message:

    `Please insert disk labeled "Sun STK RAID REM Firmware Disk."`

13. **Press Enter to select the file.**

    The utility loops through the all the files on the USB flash drive one-by-one

14. **Press Enter for each file until all the files are selected.**

    When all the files are selected, the utility displays a message:

    "`AFU is about to update firmware...`"

15. **Press Enter.**

    The utility asks you to wait, and displays a number of messages. This can take several minutes. When the update is done, the following message appears:

    `Flash image was updated and verified successfully. Press any key to continue.`

16. **Press a key.**

    The utility displays a message "`Please restart the computer`" then offers another list of selections.

17. **Select Exit, and confirm by selecting Yes.**

    The utility exits to DOS.

18. **Press Alt+Ctrl+Del to reboot the server module.**

    The server module reboots.

# System Specifications

This appendix contains physical, power, environmental, and acoustic noise emission specifications for the Sun Blade X6450 server modules.

## A.1 Server Module Specifications

**TABLE A-1**    Server Module Physical Specifications

| Specification | Value |
|---|---|
| Width | 17 inches (432 mm) |
| Height | 1.7 inches (44 mm) |
| Depth | 24 inches (610 mm) |
| Weight | 17 pounds (8 kg) |

**TABLE A-2**    Server Module Environmental Specifications

| Specification | Value |
|---|---|
| Temperature (operating) | 41- 95° F<br>5 - 35° C |
| Temperature (storage) | -40 - 158° F<br>-40 - 70° C |
| Humidity | 10%- 90% non-condensing |
| Operating altitude | 0 - 10,000 feet (0 - 3048 m) |

# BIOS Power-On Self-Test (POST) Codes

The system BIOS provides a rudimentary power-on self-test (POST), during which the BIOS checks the basic devices required for the server to operate. The progress of the self-test is indicated by a series of POST codes. This chapter explains the BIOS POST testing, provides an alternate method for viewing the codes, describes how to change POST options, and lists the POST codes.

This chapter contains the following sections:

## B.1    Introduction

The POST is a systematic check of basic system devices. As the testing progresses, the BIOS displays codes that you can use to interpret the status of your server. The codes appear at the bottom right corner of the system's VGA screen, after the self-test has progressed far enough to initialize the video monitor. Because the codes might scroll off of the screen too quickly to be read, an alternate method of displaying POST codes is to redirect the output of the console to a serial port (see Section B.3, "Redirecting Console Output" on page B-2).

# B.2 How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is shadowed (that is, copied from ROM to DRAM).

2. Once executing out of DRAM, the BIOS performs a simple memory test (a write/read of every location with the pattern `55aa55aa`).

---

**Note –** This memory test is performed only if Quick Boot is *not* enabled from the Boot Settings Configuration screen. Enabling Quick Boot causes the BIOS to skip the memory test. See Section B.4, "Changing POST Options" on page B-3 for more information.

---

3. The BIOS polls the memory controllers for both correctable and non-correctable memory errors and logs those errors into the SP.

4. The message, `BMC Responding` appears at the end of POST.

# B.3 Redirecting Console Output

Use these instructions to access the SP and redirect the console output so that the BIOS POST codes can be read remotely.

## ▼ To Redirect Console Output

1. **Attach a multi-port dongle cable to the server module UCP connector.**

2. **Attach a monitor to the multi-port dongle cable's video port and a keyboard to a USB connector.**

3. **Power cycle or power on the server.**

4. **Initialize the BIOS Setup Utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   The BIOS Main Menu screen appears.

5. **Select Server.**

   The Server screen appears.

6. **Select AST2000 LAN Configuration.**

   The LAN Configuration screen appears.

7. **Select the IP Address menu item.**

   The SP's IP address appears

8. **Start a web browser and type the SP's IP address in the browser's address bar.**

9. **Type a user name and password as follows:**

   User name: `root`
   Password: `changeme`

10. **The ELOM SP web interface screen appears.**

11. **Click the Remote Control tab.**

12. **Click the Redirection tab.**

13. **Click on the Start Redirection button.**

    The javaRConsole window appears and prompts you for your user name and password again.

14. **When you are prompted, type a user name and password with administrator privileges.**

    The current POST screen appears.

# B.4     Changing POST Options

These instructions are optional, but you can use them to change the operations that the server performs during POST testing.

## ▼ To Change POST Options

1. **Initialize the BIOS Setup Utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   The BIOS Main Menu screen appears.

2. **Select the Boot menu.**

   The Boot Settings screen appears.

3. **Select Boot Settings Configuration.**

   The Boot Settings Configuration screen appears.

4. **On the Boot Settings Configuration screen, there are several options that you can enable or disable:**

   - **Hit 'F2' Message Display:** Displays "Press F2 to run Setup" in POST. This option is enabled by default.

   - **Quick Boot:** This option is enabled by default. The BIOS skips certain tests while booting, such as the extensive memory test. This decreases the time it takes for the system to boot.

   - **Quiet Boot:** This option is disabled by default. If you enable this option, the Sun Microsystems logo appears instead of POST codes.

   - **Add On ROM Display Mode:** This option is set to Force BIOS by default. This option takes effect only if you have also enabled the Quiet Boot option, but it controls whether output from the Option ROM is displayed. The two settings for this option are as follows:

     - **Force BIOS:** Remove the Sun logo and display Option ROM output.

     - **Keep Current:** Do not remove the Sun logo. The Option ROM output is not displayed.

   - **Boot Num-Lock:** This option is On by default (keyboard Num-Lock is turned on during boot). If you set this option off, the keyboard Num-Lock is not turned on during boot.

   - **Wait for F1 if Error:** This option is enabled by default. The system pauses if an error is found during POST and only resumes when you press the F1 key.

   - **Interrupt 19 Capture:** This option is reserved for future use. Do not change.

# B.5    POST Codes

TABLE B-1 contains descriptions of each of the POST codes, listed in the same order in which they are generated. These POST codes appear as a four-digit string that is a combination of two-digit output from primary I/O port 80 and two-digit output from secondary I/O port 81. In the POST codes listed in TABLE B-1, the first two digits are from port 81 and the last two digits are from port 80.

The Response column describes the action taken by the system on encountering the corresponding error. The choices are:

- **Warning** or **Not an Error** – The message appears on the screen. An error record is logged to the system event log (SEL). The system continues booting with a degraded state. The user might want to replace the unit.

- **Pause** – The message appears on the screen, an error is logged to the SEL, and user input is required to continue. The user can take immediate corrective action or choose to continue booting.

- **Halt** – The message appears on the screen, an error is logged to the SEL, and the system cannot boot unless the error is resolved. The user needs to replace the faulty part and restart the system.

**TABLE B-1**   Error Messages and Responses

| Error Code | Error Message | Response |
|---|---|---|
| 0000 | Timer Error | Pause |
| 0003 | CMOS Battery Low | Pause |
| 0004 | CMOS Settings Wrong | Pause |
| 0005 | CMOS Checksum Bad | Pause |
| 000B | CMOS memory size Wrong | Pause |
| 000C | RAM R/W test failed | Pause |
| 000E | A: Drive Error | Pause |
| 000F | B: Drive Error | Pause |
| 0012 | CMOS Date/Time Not Set | Pause |
| 0040 | Refresh Timer Test Failed | Halt |
| 0041 | Display Memory Test Failed | Pause |
| 0042 | CMOS Display Type Wrong | Pause |
| 0043 | ~<INS> Pressed | Pause |
| 0044 | DMA Controller Error | Halt |
| 0045 | DMA-1 Error | Halt |
| 0046 | DMA-2 Error | Halt |
| 0047 | Unknown BIOS error. Error code = 0047 | Halt |
| 0048 | Password Check Failed | Halt |
| 0049 | Unknown BIOS error. Error code = 0049 | Halt |
| 004A | Unknown BIOS error. Error code = 004A | Pause |
| 004B | Unknown BIOS error. Error code = 004B | Pause |
| 004C | Keyboard/Interface Error | |
| 005D | S.M.A.R.T. Command Failed | |

**TABLE B-1** Error Messages and Responses *(Continued)*

| Error Code | Error Message | Response |
|---|---|---|
| 005E | Password Check Failed | Pause |
| 0101 | Warning! This system board does not support the power requirements of the installed processor. The processor will be run at a reduced frequency, which will impact system performance. | Pause |
| 0102 | Error! The CPU Core to Bus ratio or VID configuration has failed! Please enter BIOS Setup and re-config it. | Pause |
| 0103 | ERROR! CPU MTRRs configuration failed! Uncacheable memory hole or PCI space too complicated. | |
| 0120 | Thermal Trip Failure | Pause |
| 0121 | Thermal Trip Failure | Pause |
| 0122 | Thermal Trip Failure | Pause |
| 0123 | Thermal Trip Failure | Pause |
| 0124 | Thermal Trip Failure | Pause |
| 0125 | Thermal Trip Failure | Pause |
| 0126 | Thermal Trip Failure | Pause |
| 0127 | Thermal Trip Failure | Pause |
| 0128 | Thermal Trip Failure | |
| 0129 | Thermal Trip Failure | |
| 012A | Thermal Trip Failure | |
| 012B | Thermal Trip Failure | |
| 012C | Thermal Trip Failure | |
| 012D | Thermal Trip Failure | |
| 012E | Thermal Trip Failure | |
| 012F | Thermal Trip Failure | |
| 0150 | Processor Failed BIST | Pause |
| 0151 | Processor Failed BIST | Pause |
| 0152 | Processor Failed BIST | Pause |
| 0153 | Processor Failed BIST | Pause |
| 0154 | Processor Failed BIST | Pause |
| 0155 | Processor Failed BIST | Pause |
| 0156 | Processor Failed BIST | Pause |
| 0157 | Processor Failed BIST | Pause |

**TABLE B-1**  Error Messages and Responses  *(Continued)*

| Error Code | Error Message | Response |
| --- | --- | --- |
| 0158 | Processor Failed BIST | |
| 0159 | Processor Failed BIST | |
| 015A | Processor Failed BIST | |
| 015B | Processor Failed BIST | |
| 015C | Processor Failed BIST | |
| 015D | Processor Failed BIST | |
| 015E | Processor Failed BIST | |
| 015F | Processor Failed BIST | |
| 0160 | Processor missing microcode | Pause |
| 0161 | Processor missing microcode | Pause |
| 0162 | Processor missing microcode | Pause |
| 0163 | Processor missing microcode | Pause |
| 0164 | Processor missing microcode | Pause |
| 0165 | Processor missing microcode | Pause |
| 0166 | Processor missing microcode | Pause |
| 0167 | Processor missing microcode | Pause |
| 0168 | Processor missing microcode | |
| 0169 | Processor missing microcode | |
| 016A | Processor missing microcode | |
| 016B | Processor missing microcode | |
| 016C | Processor missing microcode | |
| 016D | Processor missing microcode | |
| 016E | Processor missing microcode | |
| 016F | Processor missing microcode | |
| 0180 | BIOS does not support current stepping | Pause |
| 0181 | BIOS does not support current stepping | Pause |
| 0182 | BIOS does not support current stepping | Pause |
| 0183 | BIOS does not support current stepping | Pause |
| 0184 | BIOS does not support current stepping | Pause |
| 0185 | BIOS does not support current stepping | Pause |

**TABLE B-1** Error Messages and Responses *(Continued)*

| Error Code | Error Message | Response |
|---|---|---|
| 0186 | BIOS does not support current stepping | Pause |
| 0187 | BIOS does not support current stepping | Pause |
| 0188 | BIOS does not support current stepping | |
| 0189 | BIOS does not support current stepping | |
| 018A | BIOS does not support current stepping | |
| 018B | BIOS does not support current stepping | |
| 018C | BIOS does not support current stepping | |
| 018D | BIOS does not support current stepping | |
| 018E | BIOS does not support current stepping | |
| 018F | BIOS does not support current stepping | |
| 0192 | L2 cache size mismatch | |
| 0193 | CPUID, Processor stepping are different | |
| 0194 | CPUID, Processor family are different | Pause |
| 0195 | Front side bus mismatch. System halted. | |
| 0196 | CPUID, Processor Model are different. | Pause |
| 0197 | Processor speeds mismatched. | Pause |
| 5120 | CMOS cleared by jumper. | Pause |
| 5121 | Password cleared by jumper. | Pause |
| 5125 | Not enough conventional memory to copy PCI Option ROM | |
| 5180 | Unsupported Memory Vendor : DIMM_A0 | Warning |
| 5181 | Unsupported Memory Vendor : DIMM_A1 | Warning |
| 5182 | Unsupported Memory Vendor : DIMM_A2 | Warning |
| 5183 | Unsupported Memory Vendor : DIMM_A3 | Warning |
| 5184 | Unsupported Memory Vendor : DIMM_A4 | |
| 5185 | Unsupported Memory Vendor : DIMM_B0 | Warning |
| 5186 | Unsupported Memory Vendor : DIMM_B1 | Warning |
| 5187 | Unsupported Memory Vendor : DIMM_B2 | Warning |
| 5188 | Unsupported Memory Vendor : DIMM_B3 | Warning |
| 5189 | Unsupported Memory Vendor : DIMM_B4 | Warning |
| 518A | Unsupported Memory Vendor : DIMM_B5 | Warning |

**TABLE B-1** Error Messages and Responses *(Continued)*

| Error Code | Error Message | Response |
|---|---|---|
| 518B | Unsupported Memory Vendor : DIMM_C0 | Warning |
| 518C | Unsupported Memory Vendor : DIMM_C1 | Warning |
| 518D | Unsupported Memory Vendor : DIMM_C2 | Warning |
| 518F | Unsupported Memory Vendor : DIMM_C3 | Warning |
| 5190 | Unsupported Memory Vendor : DIMM_C4 | Warning |
| 5191 | Unsupported Memory Vendor : DIMM_C5 | Warning |
| 5192 | Unsupported Memory Vendor : DIMM_D0 | Warning |
| 5193 | Unsupported Memory Vendor : DIMM_D1 | Warning |
| 5194 | Unsupported Memory Vendor : DIMM_D2 | Warning |
| 5195 | Unsupported Memory Vendor : DIMM_D3 | Warning |
| 5196 | Unsupported Memory Vendor : DIMM_D4 | Warning |
| 5197 | Unsupported Memory Vendor : DIMM_D5 | Warning |
| 51A0 | Unsupported AMB Vendor : DIMM_A0 | Warning |
| 51A1 | Unsupported AMB Vendor : DIMM_A1 | Warning |
| 51A2 | Unsupported AMB Vendor : DIMM_A2 | Warning |
| 51A3 | Unsupported AMB Vendor : DIMM_A3 | Warning |
| 51A4 | Unsupported AMB Vendor : DIMM_A4 | Warning |
| 51A5 | Unsupported AMB Vendor : DIMM_A5 | Warning |
| 51A6 | Unsupported AMB Vendor : DIMM_B0 | Warning |
| 51A7 | Unsupported AMB Vendor : DIMM_B1 | Warning |
| 51A8 | Unsupported AMB Vendor : DIMM_B2 | Pause |
| 51A9 | Unsupported AMB Vendor : DIMM_B3 | Warning |
| 51AA | Unsupported AMB Vendor : DIMM_B4 | Warning |
| 51AB | Unsupported AMB Vendor : DIMM_B5 | Warning |
| 51AC | Unsupported AMB Vendor : DIMM_C0 | Warning |
| 51AD | Unsupported AMB Vendor : DIMM_C1 | Pause |
| 51AE | Unsupported AMB Vendor : DIMM_C2 | Warning |
| 51AF | Unsupported AMB Vendor : DIMM_C3 | Pause |
| 51B0 | Unsupported AMB Vendor : DIMM_C4 | Pause |
| 51B1 | Unsupported AMB Vendor : DIMM_C5 | Pause |

**TABLE B-1** Error Messages and Responses *(Continued)*

| Error Code | Error Message | Response |
|---|---|---|
| 51B2 | Unsupported AMB Vendor : DIMM_D0 | |
| 51B3 | Unsupported AMB Vendor : DIMM_D1 | |
| 51B4 | Unsupported AMB Vendor : DIMM_D2 | |
| 51B5 | Unsupported AMB Vendor : DIMM_D3 | |
| 51B6 | Unsupported AMB Vendor : DIMM_D4 | |
| 51B7 | Unsupported AMB Vendor : DIMM_D5 | |
| 51C0 | Memory Configuration Error. | |
| 8101 | Warning! USB Host Controller not found at the specified address!!! | |
| 8102 | Error! USB device failed to initialize!!! | |
| 8104 | Warning! Port 60h/64h emulation is not supported by this USB Host Controller!!! | |
| 8105 | Warning! EHCI controller disabled. It requires 64bit data support in the BIOS. | |
| 8301 | Not enough space in runtime area. SMBIOS data will not be available. | |
| 8302 | Not enough space in runtime area. SMBIOS data will not be available. | |
| 8601 | Error: BMC Not Responding | |
| 8701 | Insufficient Runtime space for MPS data.!!. System may operate in PIC or Non-MPS mode. | |

# Index