Sun Blade™ X6270 Server Module Service Manual

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Contents

Preface

The *Sun Blade X6270 Server Module Service Manual* contains information and procedures for maintaining and upgrading the Sun Blade™ X6270 Server Module.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Blade X6270 Server Module Safety and Compliance Guide* (820-4411) and in the *Important Information for Sun Hardware Systems* (816-7190).

Product Updates

For product updates that you can download for the Sun Blade X6270 Server Module, please visit the following web site:

http://www.sun.com/download/

Find the Hardware Drivers section and click x64 Servers & Workstations. The Sun Blade X6270 Server Module site contains updates for firmware and drivers, as well as CD-ROM ISO images.

Related Documentation

The documents listed in the following table are available online at:

http://docs.sun.com/app/docs/prod/blade.x6270

Title	Content	Part Number	Format
Sun Blade X6270 Server Module Product Notes	Late-breaking information about the server module	820-6179	PDF HTML
Sun Blade X6270 Server Module Getting Started Guide	Basic installation information for setting up the server module	820-6181	PDF Print
Sun Blade X6270 Server Module Installation Guide	Detailed installation information for setting up the server module	820-6175	PDF HTML Print option
Sun Blade X6270 Server Module Linux, VMware, and Solaris Operating Systems Installation Guide	Installation instructions for the Linux, VMware, and Solaris operating systems	820-6176	PDF HTML
Sun Blade X6270 Server Module Windows Operating System Installation Guide	Installation instructions for the Windows Server operating system	820-6177	PDF HTML
Sun Installation Assistant for Linux and Windows User's Guide	Instructions for using the Sun Installation Assistant (SIA) when installing a Windows or Linux operating system	820-3357	PDF HTML
Sun Blade X6270 Server Module Service Manual	Information and procedures for maintaining and upgrading the server module	820-6178	PDF HTML
x64 Servers Utilities Reference Manual	Information for using applications and utilities common to x64 servers and server modules	820-1120	PDF HTML
Sun x64 Servers Diagnostics Guide	Information about how to use the diagnostic software tools provided with x64 servers	820-6750	PDF HTML

Title	Content	Part Number	Format
Sun Integrated Lights Out Manager 3.0 document collection	These documents cover ILOM features and tasks that are common to servers and server modules that support ILOM 3.0.	820-5523 820-6410 820-6411 820-6412 820-6413	PDF HTML
Sun Integrated Lights Out Manager 2.0 User's Guide	ILOM features and tasks that are common to servers and server modules that support ILOM	820-1188	PDF HTML
Sun Integrated Lights Out Manager (ILOM) Supplement for Sun Blade X6270 Server Module	ILOM information that is specific to the server module	820-6180	PDF HTML
Important Safety Information for Sun Hardware Systems	Multilingual hardware safety and compliance information for all Sun hardware systems	816-7190	Print

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

Documentation, Support, and Training

Sun Function	URL
Sun Documentation	http://docs.sun.com
Support	http://www.sun.com/support/
Training	http://www.sun.com/training/

Typographic Conventions

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

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

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, which is at:

http://docs.sun.com

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 the title and part number of your document with your feedback:

Sun Blade X6270 Server Module Service Manual, part number 820-6178-11

CHAPTER **1**

Sun Blade X6270 Hardware and Software Features

This chapter summarizes the features available on the Sun Blade X6270 Server Module and contains the following topics:

1.1 Server Hardware and Software Features

TABLE 1-1 summarizes the standard configurations and optional components available for the Sun Blade X6270 Server Module.

TABLE 1-1   Server Hardware and Software Features

X6270 Server Module	Description
Standard Server Components Shipped	The following standard components are shipped on the Sun Blade X6270 Server Module: • Service Processor (SP). One SP per server. SP provides remote KVMS functionality, IPMI baseboard management controller (BMC) functionality, and interfaces to the chassis monitoring module (CMM). The SPs and CMM work together to form a complete server module and chassis management system. • Indicators and Buttons. The Sun Blade X6270 Server Module includes standard service indicator LEDs and buttons. • Flexible I/O Network Connectivity. Supported I/O network connectivity can include these optional components: Fabric expansion module, chassis network express modules, and chassis PCI express modules. • Front Panel I/O Device Connection. The Sun Blade X6270 Server Module front panel provides a universal connection port for attaching devices directly to the server using a dongle cable.
Preinstalled CPU and DIMM Configurations	Servers are typically ordered and shipped with preinstalled memory and CPU configurations. Some of the preinstalled memory and CPU assemblies offered (and shipped) for the Sun Blade X6270 Server Module can include: • 2 Xeon Quad-Core E5520 CPU – 2.26GHz, Turbo, 80W • 4GB Memory – 2x 2GB DDR3 1066MHz DIMMs *or* • 2 Xeon Quad-Core E5540 CPU – 2.53GHz, Turbo, 80W • 12GB Memory – 6 x 2GB DDR3 1066MHz DIMMs *or* • 2 Xeon Quad-Core X5570 CPU –2.93GHz, Turbo, 95W • 24GB Memory – 6 x 4GB DDR3 1333MHz DIMMs

TABLE 1-1   Server Hardware and Software Features *(Continued)*

X6270 Server Module	Description
Optional Server Components	The following optional server components may be ordered and shipped separately: • CPU Assembly Options • DDR3 Memory Kits • Compact Flash • SATA and SAS Hard Disk Drives (HDDs) and Solid State Drives (SSD) • Dongle Cable Options (3-Cable Dongle or 4-Cable Dongle) • Fabric Expansion Module (FEM) Options • RAID Expansion Module (REM) Options • Operating System Software • Printed Documentation - *Sun Blade X6270 Server Module Installation Guide.* **Note -** Server components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for servers, see the following URL: http://sunsolve.sun.com/handbook_pub/Systems/ 1. Click the name and model of your server. 2. In the product page, click `Full Components List` for the list of components.
Supported Operating Systems	The following operating systems are supported on the Sun Blade X6270 Server Module. • Microsoft Windows Server 2003 Enterprise Edition (R2 with SP2, or SP2) (32-bit and 64-bit) • Microsoft Windows Server 2003 Standard Edition (R2 with SP2, or SP2) (32-bit and 64-bit) • Microsoft Windows Server 2008, Standard Edition (32-bit or 64-bit) • Microsoft Windows Server 2008, Enterprise Edition (32-bit or 64-bit) • Microsoft Windows Server 2008, Datacenter Edition (32-bit or 64-bit) • Red Hat Enterprise Linux (RHEL) 4.7, 32-bit and 64-bit • RHEL 5.3, 64-bit • SUSE Linux Enterprise Server (SLES) 10 SP2, 64-bit • Solaris 10 10/08 and later • VMware ESX and ESXi 3.5 Update 4

1.2 Server Indicators and Buttons

identifies the front panel buttons and indicators on the server.

FIGURE 1-1   Sun Blade X6270 Server Module Front Panel
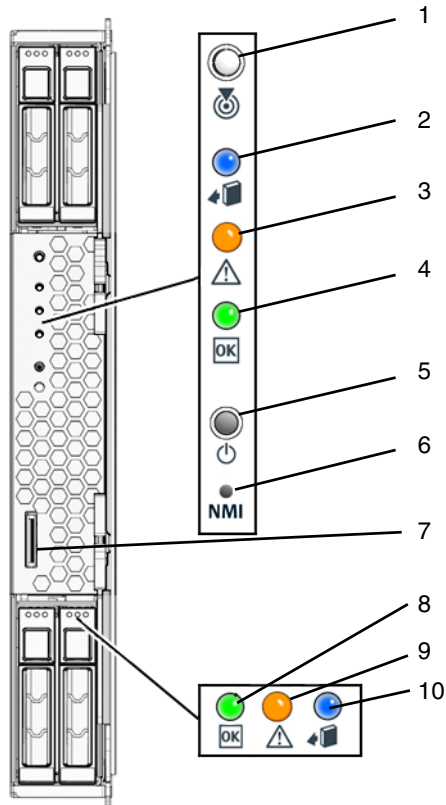
Figure Legend Sun Blade X6270 Server Module Front Panel LEDs and Buttons

1	Server Locate LED
2	Server Ready-to-Remove LED
3	Server Service Action Required LED
4	Server OK Power LED
5	Server Power Button
6	Non-Maskable Interrupt (NMI) dump button (Service Only)

7	Universal connection port (UCP)
8	Storage device (hard disk drive or solid state drive) OK Power LED
9	Storage device Service Action Required LED
10	Storage device Ready-to-Remove LED

Caution – Do not use the NMI button unless you are instructed to do so by authorized Sun Service personnel. The NMI button sends an NMI dump request to the CPUs, which is used by Sun Field Service for debugging activities at the request of Sun Service personnel.

1.3 Attaching Devices To the Server

Your system chassis is shipped with a dongle cable that enables you to connect communication devices directly to the front panel of the Sun Blade X6270 Server Module.

The Sun Blade X6270 Server Module supports one of two types of dongle cables:

- 3-Cable Dongle II (P/N 530-3936 Option # 4622A). This cable provides a VGA connector, RJ-45 serial connector, and one dual USB connector.
- 4-Cable Dongle (P/N 530-3934 Option # 4621A). This cable provides a VGA connector, DB-9 serial connector, RJ-45 serial connector, and one dual USB connector.

Note – The RJ-45 serial connector on the 4-Cable Dongle (Option# 4621A) is not functional on the Sun Blade Sun Blade X6270 Server Module. To establish a local serial connection with the Sun Blade X6270 Server Module, you should use the RJ-45 serial connector available on the 3-Cable Dongle (Option# 4622A) or the DB-9 serial connector on the 4-Cable Dongle.

Note – The 3-Cable Dongle II is typically provided with each Sun Blade 6000 or 6048 Chassis System. Additional cables may be ordered.

FIGURE 1-2 illustrates how to attach the 3-Cable Dongle to the Sun Blade X6270 Server Module universal connection port (UCP).

FIGURE 1-2   Server Front Panel I/O Connection Using 3-Cable Dongle
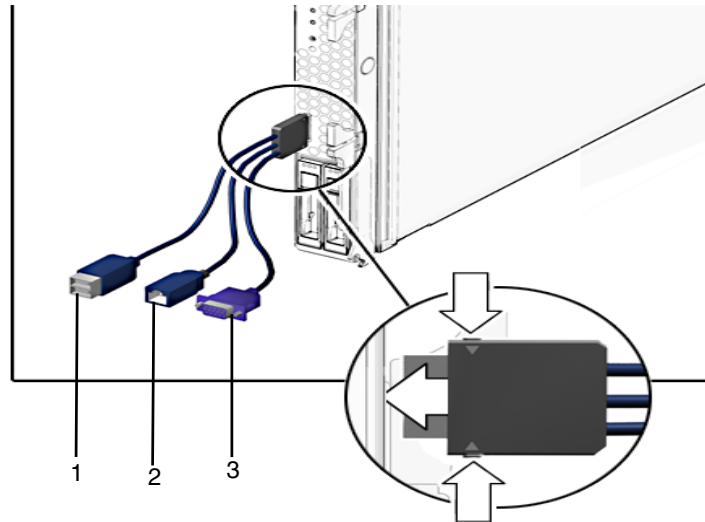
Figure Legend 3-Cable Dongle Connectors

1	Dual USB 2.0 connectors
2	RJ-45 Serial port connector
3	VGA video connector

Caution – The dongle cable should be used only for configuration and service purposes. It should be disconnected from the server module when the configuration or servicing operation is completed.

1.4 Replaceable Server Components

FIGURE 1-3 identifies the replaceable component locations on the Sun Blade X6270 Server Module, with the top cover removed.

FIGURE 1-3   Sun Blade X6270 Server Module Replaceable Component Locations
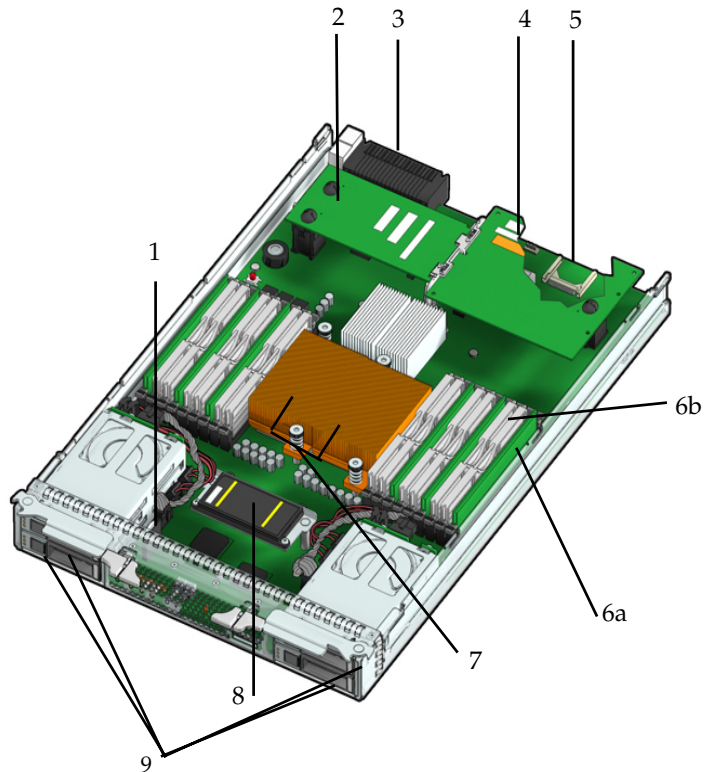
Figure Legend Replaceable Server Components

1	System battery
2	Fabric Expansion Module (FEM) (optional component)
3	Midplane connector
4	Raid Expansion Module (REM) (optional component)

5	Compact Flash Module (optional component)
	The Compact Flash Module is shown in FIGURE 1-3 under the REM.
6a	DIMMs (optional components)
	The DIMMs in FIGURE 1-3 are shown populated in DIMM slots 2, 5, 8 for each CPU.
	Note - Processor chip contains memory controller. Do not attempt to populate DIMMs sockets next to unpopulated (empty) CPU sockets.
6b	DIMM filler panels
	DIMM filler panels shown populated in DIMM slots 0, 1, 3, 4, 6 and 7.
	Note - The DIMM filler panels should remain in unpopulated DIMM slots until the DIMM filler panel can be replaced with a DIMM. Otherwise, you may experience a reduction in system performance.
7	CPU heatsinks (up to two CPUs may be installed)
	The minimum CPU configuration shipped includes one CPU with a heatsink. An air baffle is shipped to cover the empty CPU socket (not shown in FIGURE 1-3). Additional CPUs may be ordered.
	Note - In the example shown in FIGURE 1-3, the CPUs are installed under the two heatsinks.
8	REM battery (optional component)
9	Storage devices (hard disk drives or solid state drives)
	Up to four optional storage devices may be installed.

Powering On and Configuring BIOS Settings

This chapter describes how to power on and off the server, as well as how to configure BIOS settings.

The following topics are discussed in this chapter.

2.1 Powering On and Off the Server

Refer to the following topics in this section to power on and off a server:

■ Section 2.1.1, "Power On the Server Module" on page 2-2
■ Section 2.1.2, "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
■ Section 2.1.3, "Troubleshoot Server Power States" on page 2-4
■ Section 2.1.4, "Wake On LAN – Remote Power On" on page 2-5

2.1.1 Power On the Server Module

The following procedure assumes the server module is installed in a powered-on chassis.

1. **Verify that the server is in a standby power state.**

   In a Standby power state, the OK power LED on the front panel of the server blinks (0.1 second on, 2.9 seconds off). A standby power state indicates that the server module SP is active but the server module host is powered-off.

   See FIGURE 1-1 for the OK Power LED location.

   Note – The OK/Power LED will be set to standby blink only when there is enough chassis power for the server module to power on. If there is not enough chassis power, the OK/Power LED will remain off until there is enough power for the server module to power on. To troubleshoot this issue, see "Troubleshoot Server Power States" on page 4.
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2. **Apply full power to the server SP and host.**

   For example:

   ■ **Local server power-on**. Use a non-conductive pointed object or stylus to press and release the recessed Power button on the server module front panel.

      For Power button location, see FIGURE 1-1 "Sun Blade X6270 Server Module Front Panel" on page 4.

   ■ **ILOM SP web interface power-on**. Log in to the ILOM web interface for the server SP and select: Remote Control --> Remote Power Control -->Power On.

■ **ILOM SP CLI power-on.** Log in to the SP ILOM CLI and type: **start /SYS**

The OK/Power LED on the server module front panel illuminates a steady-on green light. The steady-on LED state indicates that the server module SP and host are both powered-on.

If the server does not power-on, see "Troubleshoot Server Power States" on page 4.

2.1.2 Power Off and Verify Server Is Ready for Removal From Chassis

Follow these steps to ensure that the server is properly powered off and is ready for removal from chassis.

1. **Power off the server.**

   For example:

   ■ **Graceful shutdown from local server.** Use a stylus (or other pointed object) to press and release the Power button on the front panel.

   This operation will cause any 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.

   ■ **Emergency shutdown from local server.** Press and hold the Power button for at least five seconds to force the main power off.

   ■ **ILOM CLI shutdown.** Log in to the SP ILOM CLI and type:

   stop /SYS

   ■ **ILOM web interface shutdown.** Log in to the ILOM web interface for the server SP and do the following:

   a.Select Remote Control --> Remote Power Control.

   b. Select one of the following actions from the drop-down list.

   -- Immediate Power Off: Select to power off the server.

   -- Graceful Shutdown and Power Off: Select to gracefully shut down the system operating system before the system is powered off.

   Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) for more information.

2. **To ensure that the system is powered off and ready to be removed from the chassis, do the following:**

a. **Verify that the green power LED on the front panel of the server is in standby or off state.**

b. **Ensure that the system was prepared for removal on the Component Management tab in ILOM.**

   In the Component Management tab, a `Ready (no power)` status will appear in the `Ready To Remove` column for the server.

   For more details, see the prepare to remove component procedures in the *Sun Integrated Lights Out Manager 2.0 Users Guide* (820-1188).

For information about removing the server from the chassis and removing the cover from the server, see "Removing the Server From the Chassis and Removing the Cover" on page 5.

2.1.3   Troubleshoot Server Power States

Each time a server module powers on in the Sun Blade 6000 or 6048 Series Chassis, it queries the CMM to ensure that there is enough power available from the power supply units (PSUs) to power on the server. If there is not enough power to power on the server module, the SP denies the server module from receiving power (standby and main). If this situation occurs, the OK/Power LED on the front panel of the server module will remain off. To troubleshoot this power issue, follow these guidelines:

1. Review the ILOM Event Log messages to determine if the server has permission to power on. An event message is recorded in the log any time there is not an adequate amount of power available from the PSUs to power on the server module.

   For more information about the ILOM event log or monitoring power consumption, refer to the *Sun Integrated Lights Out Manger 2.0 User's Guide* (820-1188).

2. Ensure that the system chassis has the proper amount of power supplies installed to support powering on all the chassis components currently installed.

   Refer to the system chassis documentation for information about the number of power supplies required to power on chassis components.

3. To avoid power loss, it is recommended that you use the *default* CMM power management settings for PSUs in ILOM.

   For more information about power management, refer to the *Sun Blade X6270 Server Module ILOM 2.0 Supplement Guide* (820-6180) and the *Sun Integrated Lights Out Manger 2.0 (ILOM 2.0) User's Guide* (820-1188).

2.1.4　Wake On LAN – Remote Power On

Wake On LAN (WOL) enables you to power on a server from another location over a network connection. Specifically this feature provides the ability for the network controller in the server to power the server on when a "magic packet" is received over the network from a remote system.

2.1.4.1　WOL Set Up Requirements

1. The Wake On LAN (WOL) feature in the Boot menu of the BIOS must be enabled.

   For details, see "Enabling Support for Wake ON LAN" on page 2-16.

2. The server must be installed in a chassis that has an established connection to an active power source.

   For details about how to install the power supply modules in a chassis and connect them to an active power source, see the documentation supplied with your chassis.

3. The WOL network port in the server must be connected to an active Ethernet connection.

   For details about how to install a chassis network module and connect it to an active Ethernet connection, see the documentation supplied with your chassis.

4. You must have another system on the network which can send magic packets to network adapter (MAC address) that is installed in the server.

   Typically you could use a magic packet program to send the packets over the network to wake a shutdown (WOL-enabled) server. For more details about how to send a magic packet over the network to a WOL-enabled server, refer to the documentation supplied with the magic packet program.

5. Test the WOL implementation by ensuring the magic packet sent over the network powers on the server.

   If the test fails, verify that your network environment supports magic packets. For instance, some switches and routers may block magic packets.

2.2 About The BIOS

The Basic Input/Output System (BIOS) has a setup utility stored in the BIOS flash memory. The setup utility reports system information and can be used to configure the BIOS settings. The configurable data is provided with context-sensitive help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the BIOS settings return to their default optimal values.

There are seven menus in the BIOS Setup Utility, which appear in this order: Main, Advanced, PCI, Boot, Security, Chipset, and Exit. To navigate the menus or options listed on the menu, use the arrow keys. The options or fields that you can configure on a menu appear in color. For further instructions on how to navigate and change settings in the BIOS Setup Utility, refer to the online instructions provided on the menu.

For additional information about the BIOS operations and menu options available on your server, refer to the following sections:

■ Section 2.2.1, "BIOS Booting and Set Up Considerations" on page 2-6

■ Section 2.2.2, "BIOS Setup Utility Menus" on page 2-13

■ Section 2.2.3, "Enabling Support for Common BIOS Settings" on page 2-15

■ Section 2.2.4, "Updating the BIOS Firmware" on page 2-22

2.2.1 BIOS Booting and Set Up Considerations

Refer to the following sections for information when booting the BIOS and other set up considerations:

■ Section 2.2.1.1, "Default BIOS Power-On Self-Test (POST) Events" on page 2-7

■ Section 2.2.1.2, "BIOS POST F1 and F2 Errors" on page 2-8

■ Section 2.2.1.3, "How BIOS POST Memory Testing Works" on page 2-11

■ Section 2.2.1.4, "PCI Express ExpressModule Slot Booting Priority" on page 2-12

■ Section 2.2.1.5, "Ethernet Port Device and Driver Naming" on page 2-12

■ Section 2.2.1.6, "Ethernet Port Booting Priority" on page 2-13

2.2.1.1 Default BIOS Power-On Self-Test (POST) Events

At system startup, the BIOS performs a power-on self-test that checks the hardware on your server to ensure that all components are present and functioning properly. TABLE 2-1 identifies the events that can occur during BIOS POST, as well as specifies whether these event can prevent the host from powering-on.

TABLE 2-1 BIOS POST Events

Event	Cause	Boot continues on host?
User password violation	Attempt to enter password fails three times	No
Setup password violation	Attempt to enter password fails three times	No
Correctable ECC	Correctable ECC (error correction code) error detected	Does not apply
Uncorrectable ECC	Uncorrectable ECC error detected	Does not apply
No system memory	No physical memory detected in the system	No
No usable system memory	All installed memory has experienced an unrecoverable failure	No
Hard disk controller failure	No disk controller found	Yes
Keyboard failure	Keyboard cannot be initialized	Yes
Boot media failure	No removable boot media is found	Yes
No video device	No video controller is found	No
Firmware (BIOS) ROM corruption	BIOS checksum fails and the boot block is not corrupted	No
System restart	System boot initiated	Yes
Initiated by hard reset	Boot process started by hard reset	Yes
Memory initialization	Memory sizing is occurring. System firmware progress	Does not apply
Primary processor initialization	Primary CPU initialization System firmware progress	Does not apply
Initiated by warm reset	Boot process started by warm reset	Does not apply
Embedded controller management	Management controller initialization	Does not apply
Secondary processor(s) initialization	Secondary CPU initialization asserted System firmware progress	Does not apply

TABLE 2-1 BIOS POST Events *(Continued)*

Event	Cause	Boot continues on host?
Video initialization	When BIOS initializes keyboard	Does not apply
Keyboard controller initialization	When BIOS initializes keyboard	Does not apply
Option ROM initialization	BIOS initializes Option ROMs System firmware progress	Does not apply
Option ROM space exhausted	BIOS cannot copy an option to the memory	Yes
User initiated system set up	End user initiated access to BIOS Setup Utility System firmware progress	Does not apply
User initiated boot to OS	System boot initiated System firmware progress	Does not apply
No bootable media	Nothing to boot from	No
PXE server not found	Boot error - PXE server not found F12 key was pressed but BIOS fails to boot from PXE server	No
ACPI Power state	Soft-off power applied	Does not apply

2.2.1.2   BIOS POST F1 and F2 Errors

Each power-on-self-test (POST) diagnostic is a low-level test designed to pinpoint faults in a specific hardware component. If the POST diagnostics discloses an F1 or F2 error, it typically reports the following information about the error:

- Type of error detected
- When or where the error occurred

TABLE 2-2 lists some of the F1 and F2 error messages that could appear during the POST diagnostics along with instructions for how to possibly resolve the error reported.

TABLE 2-2 BIOS POST F1 and F2 Error Messages

BIOS POST Error Message	Error Type	Resolution
Uncorrectable Error Detected on Last Boot:IOH(0) Protocol Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) QPI [x] Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. **Note -** Where QPI [x] equals 0 for QPI Link 0 or 1 for QPI Link 1.
Uncorrectable Error Detected on Last Boot:IOH(0) PCI-E [x] Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. **Note -** Where PCI-E [x] port number can range from 1 to 10 depending on the PCI root port on IOH.
Uncorrectable Error Detected on Last Boot:IOH(0) ESI Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Thermal Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) DMA Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Miscellaneous Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) VTd Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
BMC Not Responding	ILOM error	• Press F1 to continue. **Note -** This error message might display if during the SP/BIOS communication an internal error occurs. This error might require you to restart the SP.

TABLE 2-2   BIOS POST F1 and F2 Error Messages *(Continued)*

BIOS POST Error Message	Error Type	Resolution
• Primary Master Hard Disk Error • Primary Slave Hard Disk Error • Secondary Master Hard Disk Error • Secondary Slave Hard Disk Error	IDE/ATAPI error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** These error messages display when the BIOS is attempting to configure IDE/ATAPI devices in POST.
Timer Error	8254 timer error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error typically indicates an error while programming the count register of channel 2 of the 8254 timer. This could indicate a problem with system hardware.
RAM R/W test failed	Memory test failure	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error typically indicates that the RAM read/write test failed.
KBC BAT Test failed	Keyboard controller basic assurance test error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** Keyboard controller BAT test failed. This error might indicate a problem with keyboard controller initialization.
Display memory test failed	Video display error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
CMOS Battery Low	CMOS battery error	• Press F2 to enter BIOS Setup Utility to load system defaults. • Check the SP event log in ILOM for more details. • If necessary, replace CMOS battery.
• CMOS Checksum Bad • CMOS Date/Time Not Set	CMOS error	• Press F2 to enter BIOS Setup Utility to load system defaults. • Check the SP event log in ILOM for more details.

TABLE 2-2 BIOS POST F1 and F2 Error Messages *(Continued)*

BIOS POST Error Message	Error Type	Resolution
Password check failed	Password check error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error indicates that the password entered does not match the password specified in the BIOS Setup Utility. This condition might occur for both Supervisor and User password verification.
Keyboard/Interface Error	Keyboard controller error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error indicates that the Keyboard Controller failure. This error might indicate a problem with system hardware.
S.M.A.R.T error on the drive	S.M.A.R.T device error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** S.M.A.R.T. failure messages might indicate the need to replace the storage device.

2.2.1.3   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 copied from ROM to DRAM.

2. After existing out of DRAM, the BIOS performs a simple memory test (where a write/read of every location with the pattern 55aa55aa is performed).

Note – The simple 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.

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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.

2.2.1.4   PCI Express ExpressModule Slot Booting Priority

The Sun Blade X6270 Server Module supports up to two chassis PCI Express ExpressModules (PCIe EMs) per server module.

The chassis slots for the PCIe Express Modules are detected by the BIOS during startup in this order: PCIe EM BL*n*.1 and PCIe EM BL*n*.0. For example, if the server is in slot 3, the BIOS boot priority is 3.1, 3.0.

See the chassis documentation for further information on PCIe EMs.

2.2.1.5   Ethernet Port Device and Driver Naming

The Sun Blade X6270 Server Module supports up to two 10/100/1000BASE-T Gigabit Ethernet ports provided by the network express modules (NEMs) installed in the chassis. The lower NEM port is NET 0 and the upper NEM port is NET 1, as shown in FIGURE 2-1.

If you have the InfiniBand NEM installed, only one Ethernet port per server module will be available.

FIGURE 2-1   Ethernet Port Chassis Labeling Designations

NET 1

NET 0
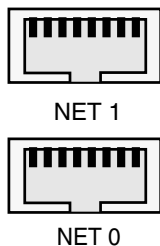
For further information on NEMs, see the chassis documentation

The device naming for the Ethernet interfaces is reported differently by different interfaces and operating systems. FIGURE 2-2 for a diagram that explains the logical (operating system) and physical (BIOS) naming conventions used for each interface.

Note – If you have an InfiniBand NEM, the Net 0 interfaces only are used.

FIGURE 2-2 Sun Blade X6270 Server Module Ethernet Port Naming

	BIOS	Solaris 10	Red Hat Linux	SUSE Linux	Windows 2003/2008
Net 1	slot 1F01	igb1	eth1	eth1	net2
Net 0	slot 1F00	igb0	eth0	eth0	net

2.2.1.6 Ethernet Port Booting Priority

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

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

2.2.2 BIOS Setup Utility Menus

TABLE 2-3 provides descriptions for the seven top-level BIOS setup menus.

TABLE 2-3 BIOS Setup Menus Summary

Menu	Description
Main	General system information.
Advanced	Configuration interface for the CPUs, SATA, ACPI, Event Log, IPMI, MPS, Remote Access, and USB.
PCI	Plug-and-Play (PnP) devices can be configured by the BIOS (default), or by the operating system (if applicable).
Boot	Configure the boot device priority (CD/DVD, removables, hard disks, solid state disks, networks).
Security	Install or change the user and supervisor passwords.
Chipset	Configuration options for the NorthBridge and SouthBridge devices. Note that the Memory Chipkill option is enabled by default. Enabling Chipkill improves system reliability but degrades system performance under specific applications.
Exit	Save or discard changes.

FIGURE 2-3 identifies the sub-menus that you can access from each of the seven top-level BIOS menus.

FIGURE 2-3   Sun Blade X6270 Server Module BIOS Configuration Utility Menu Tree
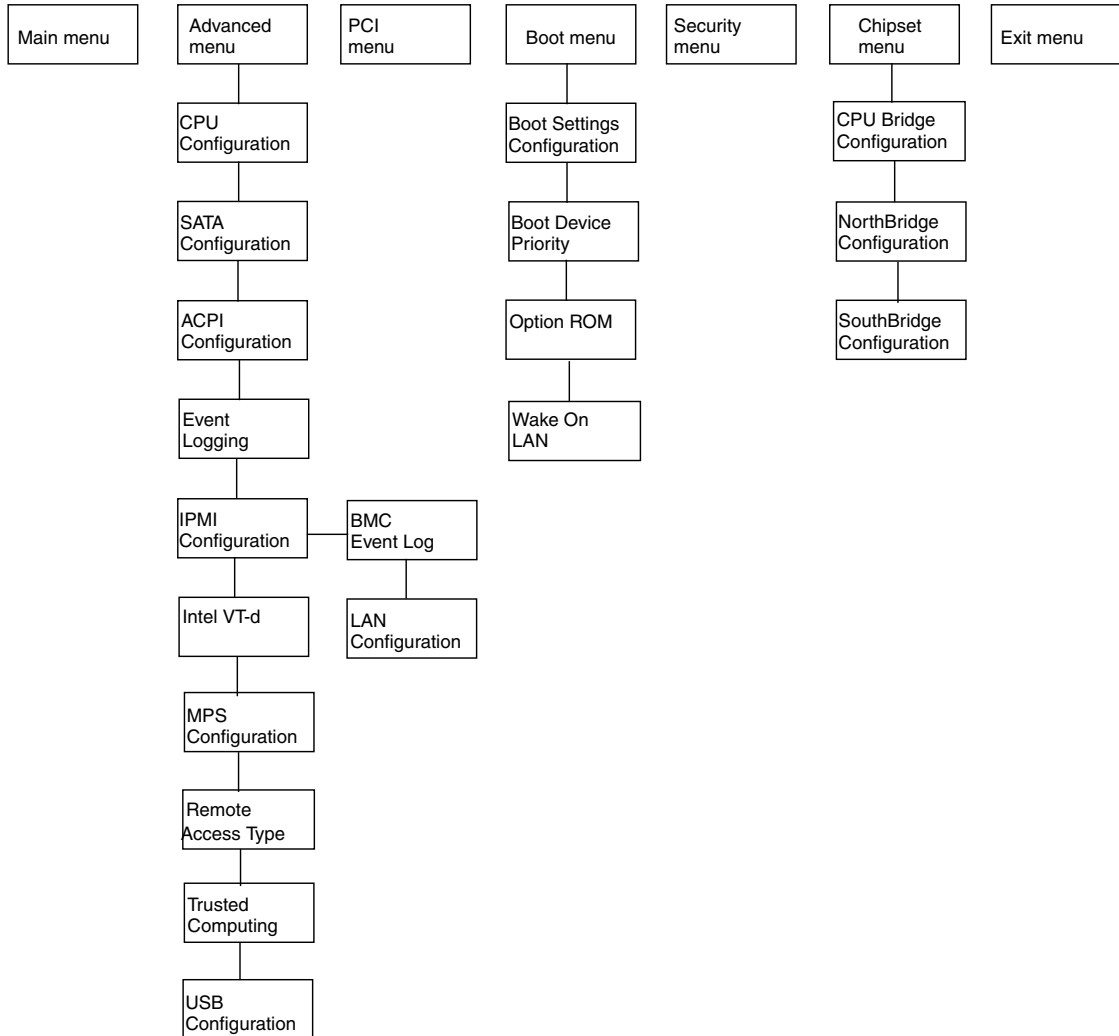
For an example of the options that are available on the BIOS Setup Utility menus, see Appendix B.

2.2.3 Enabling Support for Common BIOS Settings

This section includes instructions for:

2.2.3.1 Accessing the BIOS Setup Utility Menus

The following procedures describes the steps for accessing the BIOS Setup Utility menus.

▼ Access BIOS Setup Utility Menus

1. **Power-on or power-cycle the server.**

2. **To enter the BIOS Setup Utility, press the** F2 **key while the system is performing the power-on self-test (POST).**

Note – If there is an error during the boot process, you can press F1 to access the BIOS Setup Utility.

Alternatively, you can also use the following hot key combinations when accessing the BIOS Setup Utility from a serial connection:

- F1 - Ctrl Q
- F2 - Ctrl E.
- F7 Control-D
- F8 Control-P
- F9 Control-O
- F10 Control-S
- F12 Control-N

The BIOS Setup Utility dialog appears.

```
                          BIOS SETUP UTILITY
   Main    Advanced    PCI    Boot    Security    Chipset    Exit

   System Overview                                    Use [ENTER], [TAB]
   ──────────────                                     or [SHIFT-TAB] to
   AMIBIOS                                            select a field.
   Build Date:02/25/09
   ID        :07.01.38.03                             Use [+] or [-] to
                                                      configure system Time.
   Processor
   Intel(R) Xeon(R) CPU          E5520  @ 2.27GHz
   Speed     :2266MHz
   Count     :16

   System Memory
   Size      :4088MB                                  ←     Select Screen
                                                      ↑↓    Select Item
   System Time               [07:17:32]               +-    Change Field
   System Date               [Tue 03/10/2009]         Tab   Select Field
                                                      F1    General Help
   ▶ Serial Number Information                        (CTRL+Q from remote kbd)
                                                      F10   Save and Exit
                                                      (CTRL+S from remote kbd)

         v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

2.2.3.2 Enabling Support for Wake ON LAN

After installing the operating system, you might want to consider enabling the Wake On LAN (WOL) option in the BIOS Setup Utility. This features enables you to power on the server from another location over the network.

▼ Enable or Disable WOL in BIOS

1. **Access the BIOS Setup Utility menus.**

   For instructions, see "Access BIOS Setup Utility Menus" on page 2-15.

2. **In the BIOS Setup Utility menus, use the arrow keys (or Tab key) to navigate to the Boot menu.**

3. **In the Boot menu, highlight the Wake ON LAN setting, and then press Enter.**

   A tab appears listing the Wake ON LAN options, one for each network port.

4. **In the tab, enable the appropriate port (for example,** NET0 WAKE ON LAN **for network port 0), then press Enter and do one of the following:**

   ■ Select Enabled to enable the Wake On LAN setting.

   or

   ■ Select Disabled to disable the Wake On LAN setting.

5. **Press F10 to save and exit.**

6. **Prior to testing whether the Wake ON LAN feature is active, ensure that all the setup requirements for Wake ON LAN have been met. For more details, see** "WOL Set Up Requirements" on page 5**.**

2.2.3.3   Configuring Support for TPM

If you intend to use the Trusted Platform Module (TPM) feature set that is provided in Windows 2003 and Windows 2008, you must configure the Sun Blade X6270 Server Module to support this feature. For details, see the following procedure.

Note – TPM enables you to administer the TPM security hardware in your server. For additional information about implementing this feature, refer to the Windows Trusted Platform Module Management documentation provided by Microsoft.

▼ Configure TPM Support

1. **Access the BIOS Setup Utility menus.**

   For instructions, see "Access BIOS Setup Utility Menus" on page 2-15

2. **In the BIOS Setup Utility dialog box, select the Advanced menu option.**

   The Advanced page appears.

```
 Main   Advanced   PCI    Boot    Security   Chipset   Exit

 Advanced Settings                                  Configure settings
                                                    related to Trusted
 WARNING: Setting wrong values in below sections    Computing innovations
          may cause system to malfunction.

 ▶ CPU Configuration
 ▶ On-board SATA Configuration
 ▶ ACPI Configuration
 ▶ Event Log Configuration
 ▶ IPMI Configuration
 ▶ Intel VT-d Configuration
 ▶ MPS Configuration
 ▶ Remote Access Configuration                      ←    Select Screen
 ▶ Trusted Computing                                ↑↓   Select Item
 ▶ USB Configuration                                Enter Go to Sub Screen
                                                    F1   General Help
                                                    (CTRL+Q from remote kbd)
                                                    F10  Save and Exit
                                                    (CTRL+S from remote kbd)
                                                    ESC  Exit
```

3. In the Advanced menu, select Trusted Computing and press Enter.

The Trusted Computing screen appears.

```
                    BIOS SETUP UTILITY
        Advanced

 Trusted Computing                         Enable/Disable TPM
 ───────────────────────────────────────   TCG (TPM 1.1/1.2) supp
 TCG/TPM SUPPORT               [No]         in BIOS
```
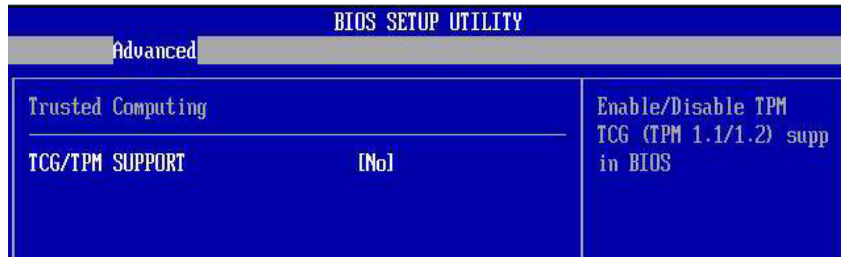
4. In the Advanced Trusted Computing menu, select the TCG/TPM Support.

A tab appears listing the available TCG/TPM options.

5. In the tab, set the TCG/TPM Support option to Yes and click OK.

Note – Even if the TCG/TPM Support option is already set to Yes, you should complete the remaining steps in this procedure to ensure that all TPM configuration requirements are satisfied.

The updated Trusted Computing screen appears and indicating that the TCG/TPM Support setting has changed to Yes.

Note – In the above dialog box, the Execute TPM Command setting is set, by default, to [Don't Change].

---

6. In the Advanced Trusted Computing menu, select the Execute TPM Command and press Enter.

A tab appears listing the available Execute TPM Command options.

7. In the tab, set the Execute TPM Command option to Enabled and click OK.

The updated Trusted Computing screen appears and indicating that the Execute TPM Command setting has changed to Enabled.

8. Press F10 to save the changes and exit BIOS.

9. To verify that TPM support is enabled, do the following:

a. Reboot the server then access the BIOS Setup Utility by pressing F2 key.

The BIOS Setup Utility screen appears.

b. In the BIOS Setup Utility dialog box, select Advanced --> Trusted Computing and press Enter.

The updated Trusted Computing screen appears indicting that TPM Support is set to Yes and TPM Enable Status is set to Enabled.

10. Press F10 to exit BIOS.

2.2.3.4   Configuring SP LAN Settings

You can assign an IP address for the server SP from the BIOS Setup Utility on the IPMI LAN configuration menu. Alternatively, you can also specify the LAN settings for the SP using ILOM. For instructions for setting the IP address in ILOM, see the *Sun Integrated Lights Out Manager 2.0 User's Guide*.

To set the IP address in the BIOS Setup Utility, use the menus to navigate to the LAN configuration setting as follows: Advanced --> IPMI Configuration --> LAN Configuration. See FIGURE 2-3 for menu navigation tree.

▼ Configure LAN Settings for SP

1. **Access the BIOS Setup Utility menus.**

   For instructions, see "Access BIOS Setup Utility Menus" on page 2-15.

2. **In the BIOS Setup Utility menus, use the arrow keys (or Tab key) to navigate to the Advanced menu.**

3. **In the Advanced menu, select IPMI Configuration.**

4. **In the IPMI Configuration menu, select LAN Confutation.**

5. **In the LAN Configuration settings dialog, use the arrow keys to select and specify the appropriate LAN configuration settings.**

```
                          BIOS SETUP UTILITY
          Advanced

 LAN Configuration.                              Enter channel number
                                                 for SET LAN Config
                                                 Command.
 Channel Number              [01]                Proper value below 16.
 IP Assignment              [Static]

 Current IP address in BMC:       010.008.187.077
 Current MAC address in BMC:      00.14.4F.CA.58.66
 Current Subnet Mask in BMC:      255.255.255.000
 Current Gateway in BMC:          010.008.187.254
 Current Active Management Port   NET MGT

 Refresh
                                                 ←     Select Screen
 IP Address                 [010.008.187.077]    ↑↓    Select Item
 Subnet Mask                [255.255.255.000]    Enter Update
 Default Gateway            [010.008.187.254]    F1    General Help
                                                 (CTRL+Q from remote kbd)
 Active Management Port      [NET MGT]            F10   Save and Exit
                                                 (CTRL+S from remote kbd)
 Commit                                          ESC   Exit
```

6. **Press F10 to save the changes and exit.**

2.2.3.5 Configuring Option ROM Settings in BIOS

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

▼ Enable or Disable Option ROM Settings

1. **Access the BIOS Setup Utility menus.**

   For instructions, see "Access BIOS Setup Utility Menus" on page 2-15.

2. **In the BIOS Setup Utility menus, use the arrow keys (or Tab key) to navigate to the Boot menu.**

   The Boot menu appears.

3. **In the Boot menu, highlight the Option ROM setting, and then press Enter.**
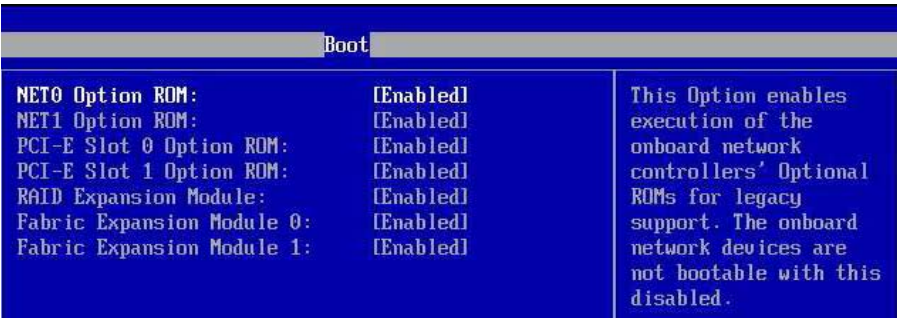
4. **In the Boot menu listing the Option ROM settings, highlight the applicable Option ROM setting to modify, then press Enter.**

   A tab appears listing the available settings.

5. **In the tab, do one of the following:**

   ■ Select Enabled to enable the Option ROM setting.

   or

   ■ Select Disabled to disable the Option ROM setting.

6. **Press F10 to save and exit.**

2.2.4 Updating the BIOS Firmware

The BIOS is updated whenever you update the ILOM SP firmware. For instructions about updating the firmware, refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188).

Maintaining the Sun Blade X6270 Server

This chapter contains information and procedures for servicing the Sun Blade X6270 Server Module hardware.

This chapter contains the following topics:

3.1 Tools and Supplies Needed

You can service the server with the following items:

- Allen wrench
- No. 2 phillips screwdriver
- Adjustable-setting torque driver (5–20 in.-lbs)
- Antistatic wrist strap
- Stylus, or other pointed object (to press the recessed Power button)

3.2 Avoid Electrostatic Discharge

Internal modules and options are electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or work environment can destroy components.

To prevent static damage whenever you are accessing any of the internal components, you must:

- Place static sensitive components such as hard drives, blades, and server hardware options on an antistatic surface. The following items can be used as an antistatic surface:
  - The bag used to ship the component
  - Sun Electronic Discharge (ESD) mat, Sun part number 250-1088
- Use the antistatic wrist strap that is supplied with each server. Attach this wrist strap to your wrist and ground the other end of strap to the system chassis (sheet metal). For additional information, see the instructions that are shipped with the strap.

3.3 Removing or Replacing Filler Panels

Each server module arrives with module-replacement filler panels for CPUs, storage drives, and memory modules. These filler panels are installed at the factory and must remain in the server until you are ready to replace them with a purchased module.

A filler panel is a metal or plastic enclosure that does not contain any functioning system hardware or cable connectors. These panels must remain in any unused module slots (storage drives, DIMMs, servers, and CPUs) to ensure proper airflow throughout the system. If you remove a filler panel and continue to operate your system with an empty module slot, the operating performance for your system could decline.

3.3.1 Remove or Insert Filler Panels

TABLE 3-1 identifies how to remove or insert server module replacement filler panels

TABLE 3-1   Filler Panel Replacement Procedures

Filler Panel Module	Remove Procedure	Install Procedure
Server Module	1. Locate the server module filler panel to be removed from the chassis. 2. To unlatch the server module filler panel from the chassis, press the button on the release lever handle, then lower the lever into the fully open position. 3. To remove the filler panel from the chassis, hold the release lever then gently slide the filler panel toward you.	1. Locate the vacant server module slot in the chassis. 2. Ensure that the release lever is fully opened, then align the filler panel with the vacant server module slot. 3. Slide the filler panel into the vacant server module slot. As the release lever makes contact with the chassis, the lever will start to rise. 4. Close the release lever until it locks the filler panel in place.
Memory Module	1. Locate the memory module filler panel to be removed from the motherboard. 2. Simultaneously press down on both ejector levers at the ends of the memory module slot. 3. Lift the filler panel straight up to remove it from the memory module socket.	1. Locate the vacant memory module slot on the motherboard. 2. Ensure that ejector levers at both ends of the memory module slot are in a fully opened position. 3. Align the memory module filler panel with with the empty slot, then gently press the filler panel into slot until both ejector levers close, locking the filler panel in place.

TABLE 3-1 Filler Panel Replacement Procedures *(Continued)*

Filler Panel Module	Remove Procedure	Install Procedure
Storage Drive Module* *Hard disk drive or solid state drive	1. Locate the disk drive filler panel to be removed from the server. 2. To unlatch the disk drive filler panel, press the release lever button then tilt the lever up into the fully opened position. 3. To remove the filler panel from the slot, hold the opened release lever and gently slide the filler panel toward you.	1. Locate the vacant disk drive module slot in the server, then ensure that the release lever on the filler panel is fully opened. 2. Slide the filler panel into the vacant slot by pressing the middle of the filler panel faceplate with your thumb or finger. The release lever will rise as it makes contact with the chassis. Do not slide the filler panel in all the way. Leave the filler panel out approximately 0.25 to 0.50 inch (6 to 12 mm) from the opening. 3. Using your thumb or finger, press on the middle of the filler panel faceplate until the release lever engages with the chassis. 4. Close the release lever until it clicks into place and is flush with the front of the server.
CPU Air Baffle (over empty CPU socket)	1. Use an Allen wrench (4 mm) to loosen the two mounting screws. 2. Gently pull up the air baffle to expose the empty CPU socket.	1. Lower the air baffle over the CPU socket, and align the holes for the mounting screws on the motherboard. 2. Insert the two mounting screws, then use an Allen wrench (4 mm) to tighten the screws.

Note – For instructions for adding or replacing chassis component filler panels (for example: network modules or chassis monitoring modules), consult the documentation supplied with your chassis.

3.4 Removing the Server From the Chassis and Removing the Cover

Use the preparatory procedures in this section when you are referred to them from the removal and replacement procedures.

Caution – Do not operate the system with empty slots. Always insert a filler panel into an empty slot to reduce the possibility of system shut down.

3.4.1 Remove Server Module From Chassis

To replace components for the Sun Blade X6270 Server Module, with the exception of the hard disk drives, you need to remove the server module from the chassis.

Note – If you are only replacing the hard disk drives in the server, you can skip this section and go to "Replacing or Adding a Hard Disk Drive" on page 3-11.

Caution – Before handling internal components of the server module, attach an electrostatic-discharge (ESD) wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

1. **Power off the server and verify that the server is ready to be removed from chassis.**

   For instructions, see "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3.

2. **Perform the following steps to remove the server from the chassis.**

   See FIGURE 3-1.

   a. **To open the ejector levers on the server: 1) press the green ejector button at the top and bottom to unlatch the server from chassis; then 2) swing out the top and bottom levers.**

   b. **To slide the server from the chassis: 1) hold the opened ejector levers and pull the ejector levers toward you; then 2) grasp the server with both hands and slide it toward you away from the chassis.**

FIGURE 3-1 Removing the Server From the Chassis
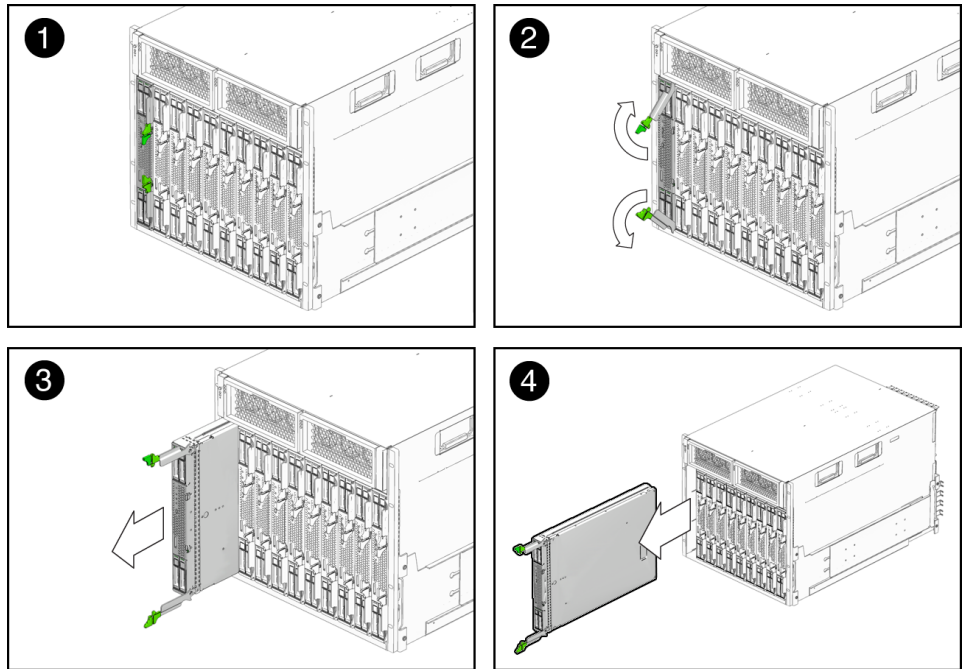
3. **Place the server on a flat antistatic surface.**

4. **Install a server module filler panel in the unused server slot to ensure proper airflow throughout the system.**

Caution – If you operate the chassis with an empty server module slot, it is possible that you will notice a reduction in the performance of your system.

3.4.2   Remove or Install Server Cover

Refer to the following instructions for removing or installing the cover on the server.

- "Remove Cover From Server" on page 3-7
- "Install Cover on Server" on page 3-7

▼ Remove Cover From Server

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 3-2.

FIGURE 3-2   Removing the Main Cover
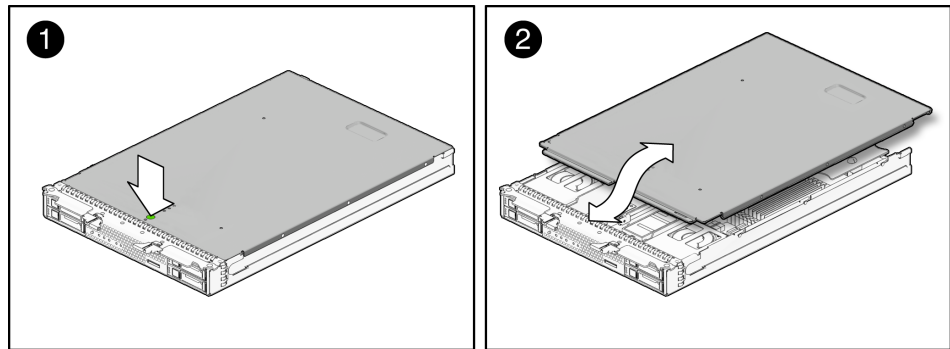
2. **Grasp the cover by its rear edge and lift it straight up from the chassis.**

▼ Install Cover on Server

1. **Slide the cover under the tabs at the front of the server module.**

2. **Gently press down on the cover to engage it with the chassis.**

3. **When applicable, install the server in the chassis and power on the system.**

   For instructions, see the *Sun Blade X6270 Server Module Installation Guide*.

3.5 Locations of Replaceable Components

FIGURE 3-3 shows the locations of the replaceable Sun Blade X6270 Server Module components that are documented in this chapter.

FIGURE 3-3 Sun Blade X6270 Server Module Replaceable Component Locations
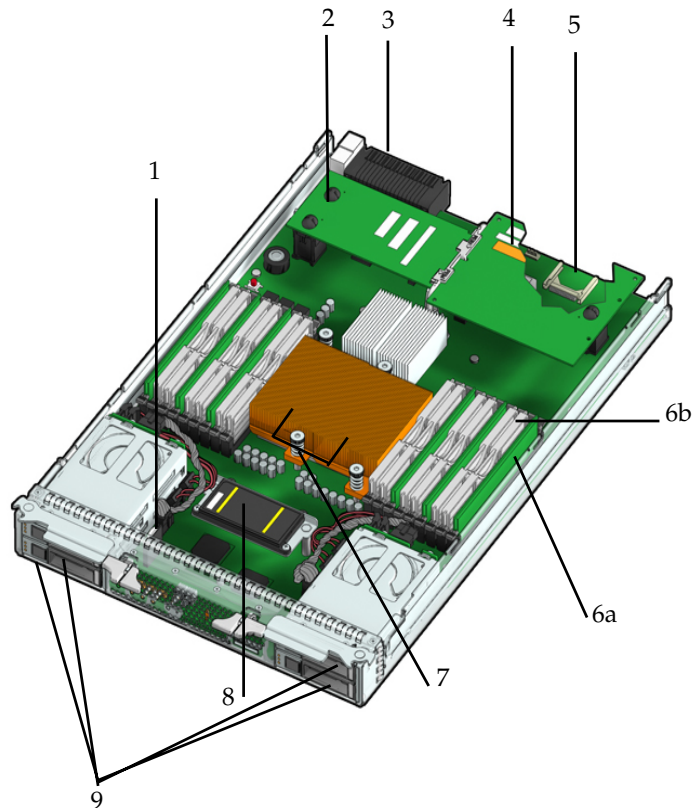
Figure Legend Replaceable Server Components

1	System battery
2	Fabric Expansion Module (FEM) (optional component)
3	Midplane connector
4	Raid Expansion Module (REM) (optional component)

5	Compact Flash Module (optional component) The Compact Flash Module under the REM.
6a	DIMMs (optional components) The DIMMs are shown populated in DIMM slots 2, 5, 8 for each CPU. Processor chip contains memory controller. Do not attempt to populate DIMMs sockets next to unpopulated (empty) CPU sockets.
6b	DIMM filler panels DIMM filler panels shown populated in DIMM slots 0, 1, 3, 4, 6 & 7. The DIMM filler panels should remain in unpopulated DIMM slots until the DIMM filler panel can be replaced with a DIMM. Otherwise, you may experience a reduction in system performance.
7	CPU heatsinks (up to two CPUs may be installed) The minimum CPU configuration shipped includes one CPU with a heatsink. An air baffle is shipped to cover the empty CPU socket (not shown in FIGURE 3-3). Additional CPUs may be ordered. In the example shown in FIGURE 3-3, the CPUs are installed under the two heatsinks.
8	REM battery (optional components)
9	Storage devices (hard disk drives (HDD) or solid state drives (SSD)) Up to four hard disk drives or solid state drives may be populated.

3.6 Replaceable Component Procedures

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 must be replaced *only* by trained Sun service technicians. Contact your Sun Service representative for assistance with FRU replacements.

Note – Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for the Sun Blade X6270 Server Module, click on the X6270 Server Module product page at:
http://sunsolve.sun.com/handbook_pub/Systems/

This section contains procedures for replacing the following components:

- "Replacing or Adding a Hard Disk Drive" on page 3-11 (CRU)
- "Replacing the System Battery" on page 3-15 (CRU)
- "Replacing the Compact Flash Module" on page 3-17 (CRU)
- "Replacing or Upgrading Memory Modules (DIMMs)" on page 3-18 (CRU)
- "Adding a RAID Expansion Module" on page 3-26 (CRU)
- "Adding or Replacing a Fabric Expansion Module" on page 3-33 (CRU)
- "Replacing or Upgrading the CPU" on page 3-34 (FRU)
- "Replacing Motherboard Enclosure" on page 3-38 (FRU)

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 and hard disk drives contain components that are extremely sensitive to static electricity.

3.6.1 Replacing or Adding a Hard Disk Drive

When replacing or adding a hard disk drive on the Sun Blade X6270 Server Module refer to following sections:

- "Internal System Software Designation for Storage Devices" on page 3-11
- "Replace or Add HDD or SSD" on page 3-12

Note – This component is a hot-swappable CRU and can be replaced by anyone.

3.6.1.1 Internal System Software Designation for Storage Devices

The internal system software designation for storage devices (hard disk drives (HDD) or solid state drives (SSD) is shown in FIGURE 3-4.

FIGURE 3-4 Designation of HDDs or SSD
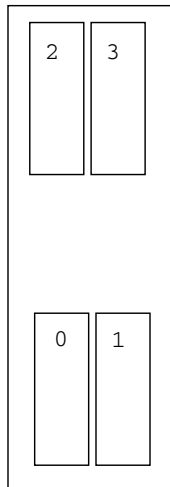
3.6.1.2 HDD or SSD Failure and RAID

A single storage device failure does not cause a data failure if the storage devices are configured as a mirrored RAID 1 volume (optional). The storage device can be removed, and when a new storage device is inserted, the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the replaced storage drive was configured as a hot-spare, the new HDD is automatically configured as a new hot-spare.

> ⚠ **Caution –** Possible data loss: If you insert an storage device that has been configured with a RAID volume into a server that did not previously have its storage devices configured with RAID volumes, the existing storage devices in the server will be converted to RAID volumes during automatic synchronization and any existing data on the existing storage devices in the server are erased. Before you permanently remove a storage device from the server that is part of an active RAID volume, you should delete the active RAID volume from the storage device. For information on how to delete a RAID volume, use the appropriate RAID management utility for the RAID controller installed.

For information about the implementation of RAID on this server and references to RAID controller documentation, refer to the *Sun Disk Management Overview For X64 Sun Fire and Sun Blade Series Servers* (820-6350).

3.6.1.3 Replace or Add HDD or SSD

Use the following procedure to replace a HDD or SSD.

1. Observe the LEDs on the front panel of the HDD to verify which HDD in the server is defective.
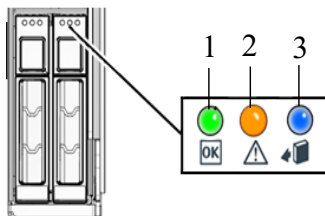
Figure Legend HDD LEDs

1	HDD or SSD Power OK LED - green (operational)
2	HDD or SSD Service Action Required - amber (faulty disk requiring service)
3	HDD or SSD Ready to Remove - blue (HDD or SSD has been prepared for removal from server)

2. To remove the faulty HDD from the server, perform the following steps:

Note – The Sun Blade X6270 Server Module HDDs are hot-swappable, which means that you can remove them while the server is running. However, you must prepare the operating system on the server prior to removing the HDD.

---

    a. Press the release lever button on the HDD (or SDD) front panel then tilt the lever up into a fully opened position.

      For example:

      ■ If removing HDD (or SSD) when server is out of chassis, see FIGURE 3-5.

      or

      ■ If removing HDD (or SSD) when server is in chassis, see FIGURE 3-6.

FIGURE 3-5   Remove Storage Device When Server Module Is Out of Chassis
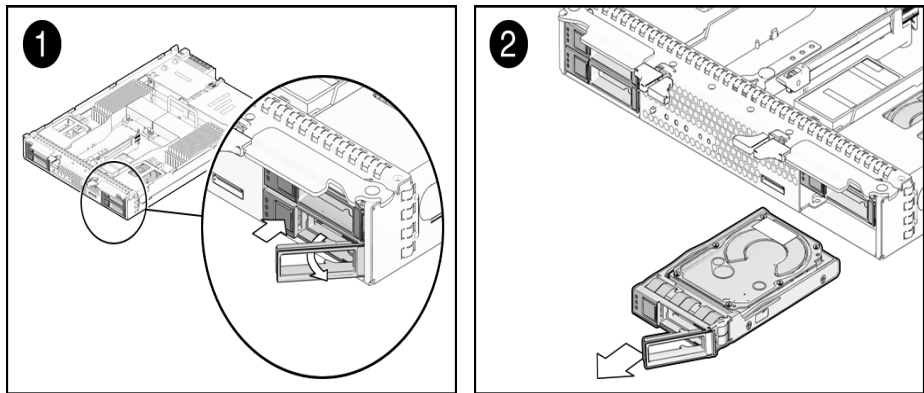
FIGURE 3-6 Remove Storage Device When Server Module is in Chassis
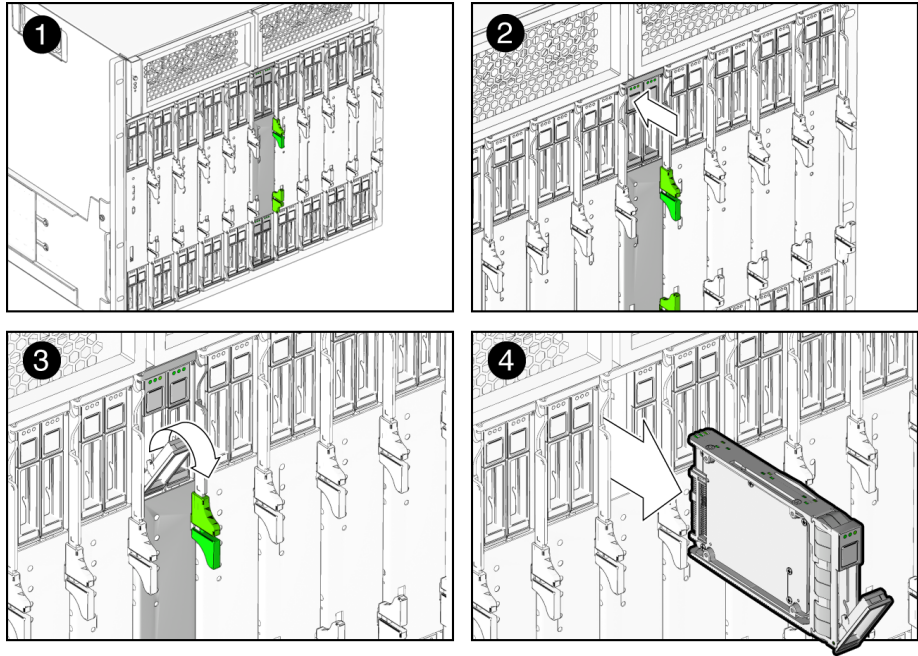
b. **Hold the opened release lever and gently slide the HDD (or SDD) toward you.**

c. **If you are not immediately replacing the HDD (or SDD), insert a filler panel into the empty HDD slot on the server,.**

   For details, see "Remove or Insert Filler Panels" on page 3-3.

⚠️ **Caution –** Do not operate the server with empty storage device slots. Always insert a filler panel into an empty storage device slot. For more information, see "Removing or Replacing Filler Panels" on page 3-3.

3. **To install (or reinstall) the HDD (or SDD), perform the following steps:**

   a. **Ensure that the HDD (or SSD) release lever is in a fully opened position.**

   b. **Slide the HDD (or SSD) into the vacant slot by pressing the middle of the HDD faceplate with your thumb or finger.**

   The release lever will rise as it makes contact with the chassis. Do not slide the storage device in all the way. Leave the storage device out approximately 0.25 to 0.50 inch from the opening.

c. **Using your thumb or finger, press on the middle of the HDD (or SSD) faceplate until the release lever engages with the chassis.**

d. **Close the release lever until it clicks into place and is flush with the front of the server.**

Note – If the storage devices were previously configured as a mirrored RAID 1 array, an automatic resynchronization is invoked and the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the replaced storage device was configured as a hot-spare, the new HDD is automatically configured as a new hot-spare.

3.6.2 Replacing the System Battery

Note – This component is a CRU and can be replaced by anyone.

Follow these steps to replace the system battery on the server.

1. **Power off the server and remove it from the chassis.**

   For instructions, see:

   - "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
   - "Remove Server Module From Chassis" on page 3-5

Caution – After removing the server from the chassis always insert a filler panel into the empty slot to avoid a possible reduction in system performance.

2. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

3. **To remove the system battery do the following:**

Caution – Removing the system battery will clear the CMOS and return the BIOS settings to their factory defaults. The BIOS will automatically notify you of this change the next time you boot the system.

   a. **Using your fingers, unlatch the battery from the socket by twisting the battery away from the socket spring.**

   b. **Lift the battery up and out of the socket, see** FIGURE 3-7.

FIGURE 3-7 Remove System Battery
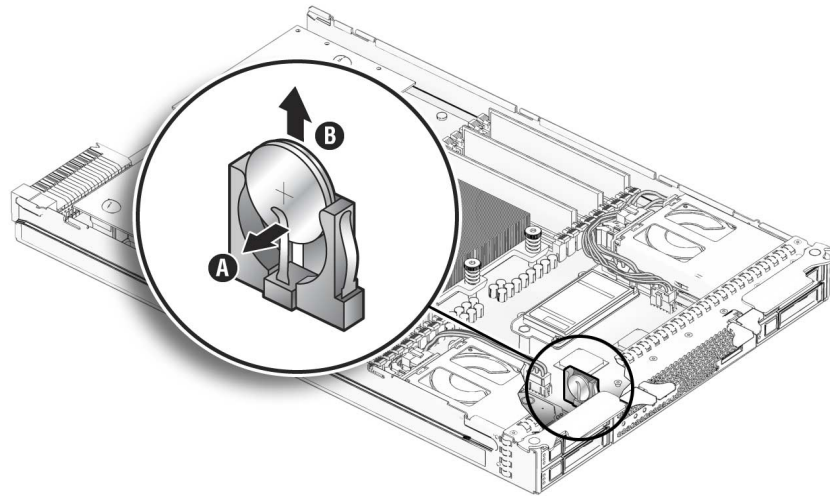
4. **Locate the replacement system battery then insert the battery into the socket with the positive (+) side of the battery facing toward the spring, see** FIGURE 3-8**.**

FIGURE 3-8 Insert System Battery
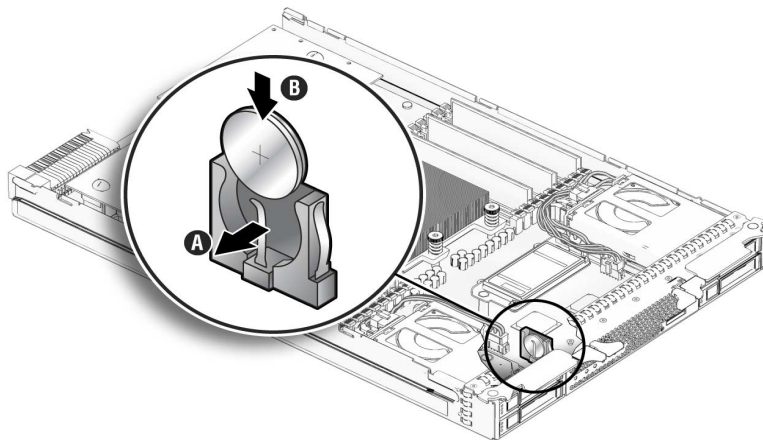
5. **Install the cover on the server.**

For instructions, see "Install Cover on Server" on page 3-7.

3.6.3 Replacing the Compact Flash Module

Note – This component is a CRU and can be replaced by anyone.

Follow these steps to replace the Compact Flash module on the server.

1. **If necessary, back up any data that is contained on the Compact Flash module.**

2. **Power off the server and remove the server from the chassis.**

   For instructions, see:

   - "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
   - "Remove Server Module From Chassis" on page 3-5.

Caution – Do not operate the system with empty slots. Always insert a filler panel into an empty slot to reduce the possibility of system shut down.

3. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

4. **Locate the Compact Flash module underneath the REM board.**

   See FIGURE 3-9.

FIGURE 3-9   Replacing the Compact Flash Module
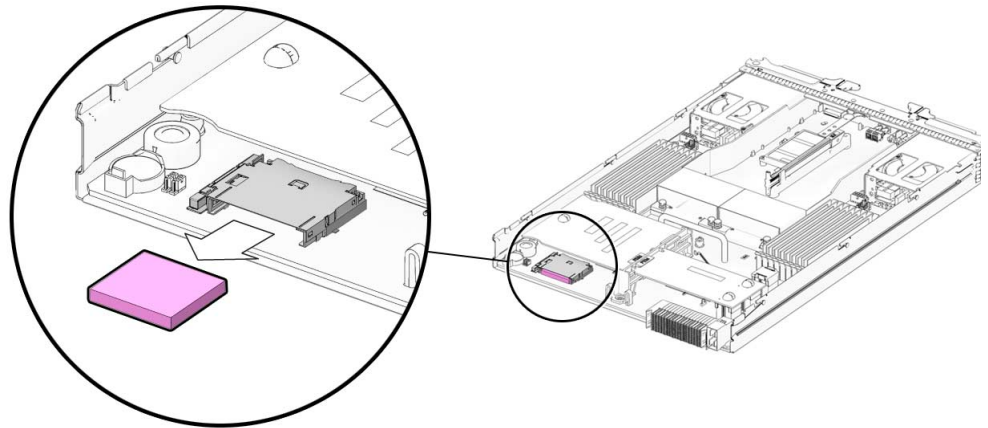
5. **To remove the Compact Flash module, use your thumb to gently push down on the compact flash card then slide the card out toward you.**

6. **To install the Compact Flash module, do the following:**

   a. **Locate the keys on the side of the Compact Flash card and align them with the sides of the compact flash slot.**

   b. **Slide the Compact Flash card into the slot until it locks into place.**

7. **Install the server cover.**

   For details, see "Install Cover on Server" on page 3-7.

3.6.4 Replacing or Upgrading Memory Modules (DIMMs)

The Sun Blade X6270 Server Module are shipped with standard memory configurations. If you ordered additional memory, a kit for the additional memory is shipped separately.

When replacing or upgrading a DIMM on the Sun Blade X6270 Server Module, see the following sections:

- "Memory Module Installation Considerations" on page 3-18
  - "DIMM and CPU Physical Layout" on page 3-19
  - "DIMM Population Rules" on page 3-20
  - "DIMM Rank Classification Labels" on page 3-21
- "Replace or Add DIMM" on page 3-22
- "Error Correction and Parity" on page 3-25
- "Inconsistencies Between DIMM Fault LEDs and the BIOS Mapping of Faulty DIMMs" on page 3-25
- "Locations of Faulty DIMMs Using ILOM Versus BIOS" on page 3-26

3.6.4.1 Memory Module Installation Considerations

The Sun Blade X6270 Server Module supports a variety of DIMM configurations that can include single-rank (SR) DIMMs, dual-rank (DR) DIMMs, or quad-rank (QR) DIMMs. When replacing or adding memory modules to the Sun Blade X6270 Server Module, you should consider the following:

- Physical layout of the DIMMs and CPUs

  For details, see "DIMM and CPU Physical Layout" on page 3-19.

- DIMM population rules

  For details, see "DIMM Population Rules" on page 3-20.

■ DIMM classification labels

For details, see "DIMM Rank Classification Labels" on page 3-21.

DIMM and CPU Physical Layout

The physical layout of the DIMMs and CPUs on a Sun Blade X6270 Server Module is shown in FIGURE 3-10.

FIGURE 3-10 CPU and DIMM Physical Layout

D8 D7 D6 D5 D4 D3 D2 D1 D0   D0 D1 D2 D3 D4 D5 D6 D7 D8
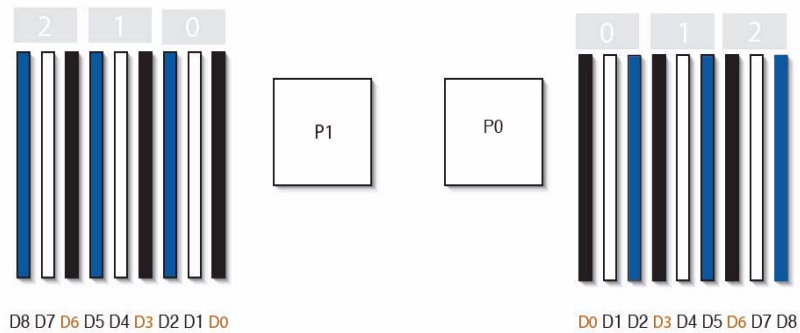
Figure Legend CPU and DIMM Layout

CPU 0 location	P0
CPU 1 location	P1
Channel locations for CPU 0	
Three channels per CPU with each channel containing three color-coded DIMM slots (black, white, and blue).	0 1 2

Channel locations for CPU 1

Three channels per CPU with each channel containing three color-coded DIMM slots (blue, white and black).

P0:

DIMM slot numbering per CPU; with D8 as the slot furthest away from processor.

D0 D1 D2 D3 D4 D5 D6 D7 D8

P1:

D8 D7 D6 D5 D4 D3 D2 D1 D0
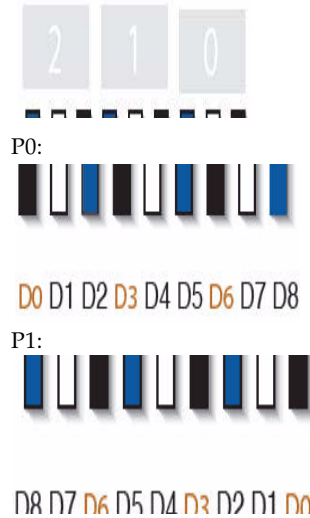
DIMM Population Rules

The DIMM population rules for the Sun Blade X6270 Server Module are as follows:

1. Do not populate any DIMM socket next to an empty CPU socket. Each processor contains a separate memory controller.

2. Each CPU can support a maximum of:

   ■ Nine dual-rank (DR) or single-rank (SR) DIMMs; *or*

   ■ Six quad-rank (QR) DIMMs with two per memory channel; *or*

   ■ Three QR DIMMs with one per channel and three DR or SR DIMMs.

3. Populate DIMMs by location according to the following rules:

   ■ Populate the DIMM slots for each memory channel that are the farthest from the CPU first.

   For example, populate D8/D5/D2 first; then D7/D4/D1 second; and finally, D6/D3/D0. See FIGURE 3-10.

   ■ Populate QR DIMMs first, followed by SR or DR DIMMs.

   ■ Populate QR DIMMs in blue sockets (D8/D5/D2) first then white sockets (D7/D4/D1). See FIGURE 3-10.

   Note that QR DIMMs are supported only in white sockets if adjacent blue socket contains a QR DIMM.

4. For maximum performance, apply the following rules:

   ▪ The best performance is ensured by preserving symmetry. For example, adding three of same kind of DIMMs, one per memory channel, and ensuring that both CPUs have the same size of DIMMs populated in the same manner.

   ▪ In certain configurations, DIMMs will run slower than their individual maximum speed. See TABLE 3-2 for further details.

TABLE 3-2 Memory Considerations and Limitations

1	DIMMs are available in two speeds: 1066 MHz and 1333 MHz.
2	DIMM speed rules are as follows: 3x DIMM per channel = 800 MHz 2x DIMM per channel = 1333 MHz (for single-rank and dual-rank DIMMs) *or* = 800 MHz (for quad-rank DIMMs) 1x DIMM per channel = 1333 MHz (if using 1333 MHz DIMMs[1]) 1x DIMM per channel = 1066 MHz (if using 1066 MHz DIMMs)
3	The system operates all memory only as fast as the slowest DIMM configuration.

[1] This DIMM configuration requires CPUs supporting 1333 MHZ.

DIMM Rank Classification Labels

DIMMs come in a variety of ranks: single, dual, or quad. Each DIMM is shipped with a label identifying its rank classification. TABLE 3-3 identifies the corresponding rank classification label shipped with each DIMM.

TABLE 3-3 DIMM Classification Labels

Rank Classification	Label
Quad-rank DIMM	4Rx4
Dual-rank DIMM	2Rx4
Single-rank DIMM	1Rx4

3.6.4.2 Replace or Add DIMM

Note – This component is a CRU and can be replaced by anyone.

Use the following procedure to replace a DIMM.

1. **Power off the server and remove the server from the chassis.**

   For instructions, see:

   - "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
   - "Remove Server Module From Chassis" on page 3-5.

Caution – After removing the server from the chassis, ensure that a filler panel is inserted into the empty server slot to reduce the possibility of a system shut down.

---

2. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

3. **To replace a faulty DIMM, perform the following steps; otherwise, proceed to Step 4.**

   a. **Identify the location of the faulty DIMM by pressing the fault remind button on the motherboard, see** FIGURE 3-11**.**

      - If DIMM ejector LED is off: DIMM is operating properly.
      - If DIMM ejector LED is on (amber): DIMM is faulty and should be replaced.

FIGURE 3-11 Fault Remind Button and LED Locations
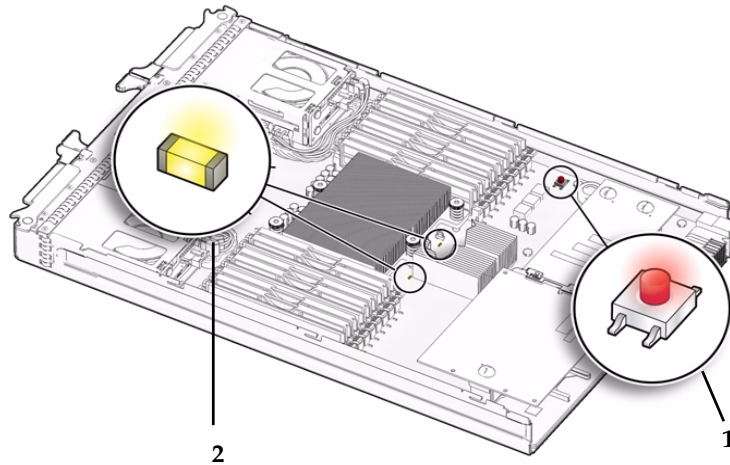
Figure Legend Fault Remind Button and LED Locations for CPUs and DIMMs

1	Fault remind button
2	DIMM and CPU LEDs

b. To remove the DIMM do the following:

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

The DIMM is partially ejected from the socket. See FIGURE 3-12.

ii. Carefully lift the DIMM straight up to remove it from the socket.

Caution – If you are not immediately inserting a replacement DIMM into the empty DIMM socket, you should insert a DIMM filler panel in the socket. For more details, see these sections, "Removing or Replacing Filler Panels" on page 3-3.

FIGURE 3-12 DIMM Socket Release and Alignment
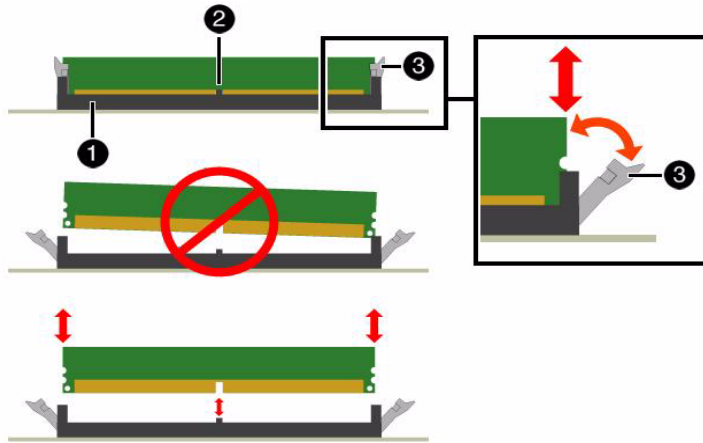
Figure Legend DIMM Socket Release and Alignment

1	DIMM connector slot
2	DIMM connector key
3	DIMM ejector lever

4. To install a DIMM do the following:

   a. Determine the DIMM socket location to populate.

   For details, see "DIMM Population Rules" on page 3-20

Note – If the DIMM socket contains a filler panel, you will need to remove the DIMM filler panel prior to installing a DIMM into the DIMM socket. For details, see "Remove or Insert Filler Panels" on page 3-3

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   b. Ensure that the ejector lever at each end of the memory socket are fully open (rotated outward) to accept the new DIMM.

   c. Ensure that the DIMM ejector levers are open (angled outward) then align the DIMM notch to the DIMM connector key. See FIGURE 3-12**.**

   d. Using both thumbs, press the DIMM straight down into the DIMM connector slot until both ejector levers close, locking the DIMM in to the socket.

> **Note –** The DIMMs must be inserted evenly, straight down into the DIMM connector slot, until the ejector levers lock into place.

    e. Verify that the DIMM ejector levers are upright, seated, and tight. Press on ejector levers to ensure that they are engaged properly.

5. Install the cover on the server.

For instructions, see "Install Cover on Server" on page 3-7.

3.6.4.3 Error Correction and Parity

The server's processor provides parity protection on its internal cache memories and error-correcting code (ECC) protection of the data. The system can detect and log the following types of errors:

- Correctable and uncorrectable memory ECC errors
- Correctable and uncorrectable CPU internal errors

Advanced ECC corrects up to 4 bits in error on nibble boundaries, as long as they are all in the same DRAM. If a DRAM fails, the DIMM continues to function.

Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) for information on how to access the error log.

3.6.4.4 Inconsistencies Between DIMM Fault LEDs and the BIOS Mapping of Faulty DIMMs

When a single DIMM is marked as faulty by ILOM (for example, `fault.memory.intel.dimm.training-failed` is listed in the SP Event Log), BIOS might map out the entire memory channel that contains the faulty DIMM as failing, that is, up to three DIMMs. As a result, the memory available to the operating system is reduced.

However, when the Fault Remind button is pressed, only the fault LED associated with the faulty DIMM lights. The fault LEDs for the other two DIMMs in the memory channel remain off. Therefore, you can correctly identify the faulty DIMM. When the faulty DIMM is replaced and the DIMM fault is cleared using ILOM, the memory available to the operating system returns to normal. For instructions for clearing DIMM faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Blade X6270 M2 Server Module* (821-0501).

3.6.4.5 Locations of Faulty DIMMs Using ILOM Versus BIOS

ILOM and BIOS use different formats to identify the location of a faulty DIMM.

- For ILOM, the format is Px/Dx, where x is 0 or 1 for CPUs, and 0 to 8 for DIMMs.
- For BIOS, the format is CPUx/CHANNELx/DIMMx, where x is 0 or 1 for CPUs, and 0 to 2 for channels and DIMMs.

TABLE 3-4 shows the mapping of faulty DIMM locations as reported by ILOM and BIOS.

TABLE 3-4   Mapping of Faulty DIMM Locations for ILOM and BIOS

ILOM Mapping for CPU0	BIOS Mapping for CPU0	ILOM Mapping for CPU1	BIOS Mapping for CPU1
P0/D0	CPU0/CHANNEL0/DIMM2	P1/D0	CPU1/CHANNEL0/DIMM2
P0/D1	CPU0/CHANNEL0/DIMM1	P1/D1	CPU1/CHANNEL0/DIMM1
P0/D2	CPU0/CHANNEL0/DIMM0	P1/D2	CPU1/CHANNEL0/DIMM0
P0/D3	CPU0/CHANNEL1/DIMM2	P1/D3	CPU1/CHANNEL1/DIMM2
P0/D4	CPU0/CHANNEL1/DIMM1	P1/D4	CPU1/CHANNEL1/DIMM1
P0/D5	CPU0/CHANNEL1/DIMM0	P1/D5	CPU1/CHANNEL1/DIMM0
P0/D6	CPU0/CHANNEL2/DIMM2	P1/D6	CPU1/CHANNEL2/DIMM2
P0/D7	CPU0/CHANNEL2/DIMM1	P1/D7	CPU1/CHANNEL2/DIMM1
P0/D8	CPU0/CHANNEL2/DIMM0	P1/D8	CPU1/CHANNEL2/DIMM0

3.6.5 Adding a RAID Expansion Module

When adding a REM card to a server, you must ensure that the server is equipped with one or more SAS or SATA hard disk drives (HDDs) or solid state drives (SSDs) in disk slots 0 through 3. For further information about the implementation and configuration of RAID on this server, see the *Sun Disk Management For x64 Sun Fire and Sun Blade Series Servers Overview Guide* (820-6350).

Caution – Back up all data to an external device prior to adding a REM to a server that does not already have a REM installed.

3.6.5.1   Add a REM Card

> **Note –** The Sun Blade X6270 Server Module can be populated either with REM card model 4620A, which uses a backup battery to store the system configuration, or REM card model 4607A, which *does not* use a backup battery.

Follow these steps to add a REM card.

1. **Power off the server and remove the server from the chassis.**

   For instructions, see:

   - "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
   - "Remove Server Module From Chassis" on page 3-5

> **Caution –** After removing the server module from the chassis, ensure that a filler panel is inserted into the empty server slot to reduce the possibility of a system shutdown.

2. **Remove the cover from the server module.**

   For details, see "Remove or Install Server Cover" on page 3-7.

3. **On a new REM card 4620A installation, immediately remove the REM battery from the new REM card.**

4. **Use two screws to attach the REM battery to the bracket at the front of the server module (see** FIGURE 3-13**, location 1).**

FIGURE 3-13 Possible REM Battery Locations
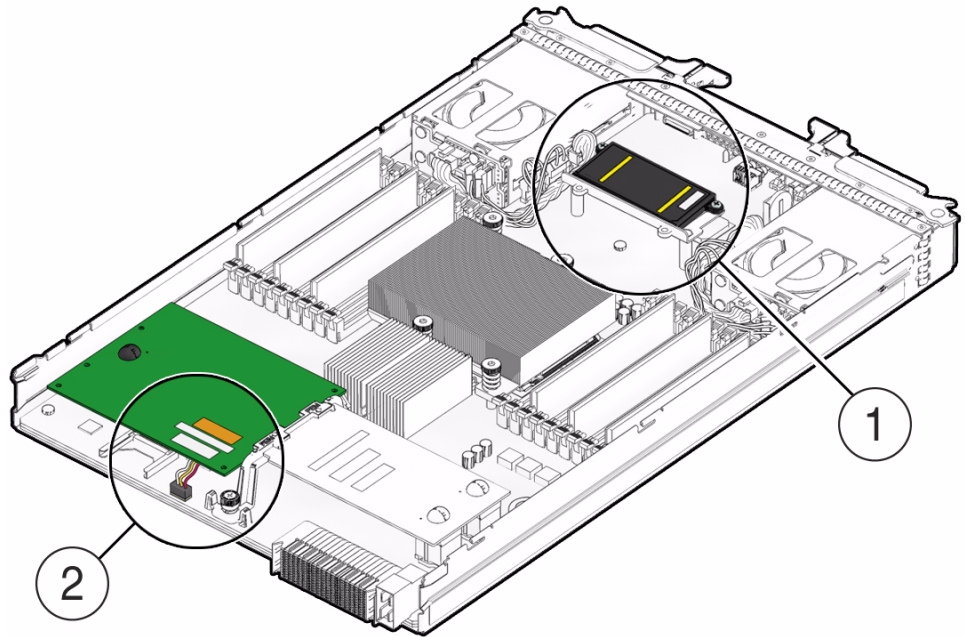
Figure Legend

1	REM battery installed on the bracket at the front of the server module
2	REM battery installed on the REM card

5. Connect the battery cable to the motherboard and REM card. See FIGURE 3-14**.**

FIGURE 3-14 REM cable connected to the motherboard
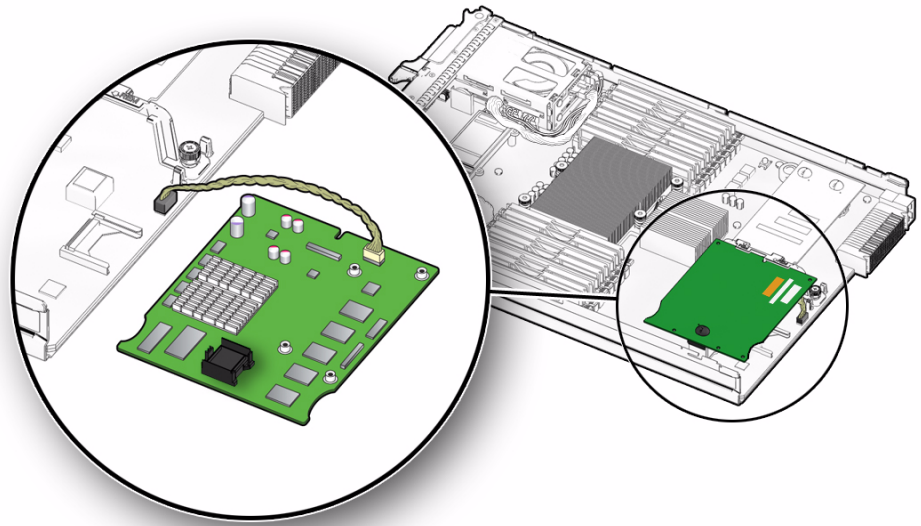
6. **Install the new REM card by sliding it at an angle into the support bracket, then pressing it carefully into its connector. See** FIGURE 3-15**.**

FIGURE 3-15 Insert REM card
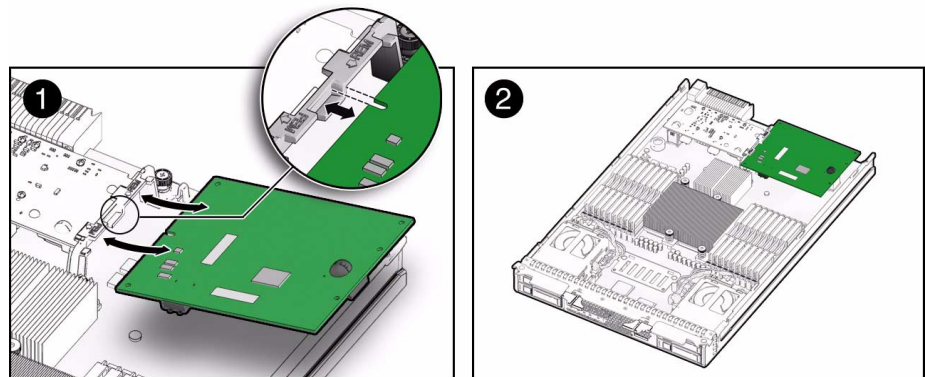
Caution – Step 7 will remove all data from the system. Back up your data to an external site before proceeding.

7. **(Optional) If you want to switch your drives from SATA to SAS or from SAS to SATA, you should replace the drives at this time.**

    For details, see "Replacing or Adding a Hard Disk Drive" on page 3-11.

8. **Install the cover on the server.**

    For instructions, see "Install Cover on Server" on page 3-7.

9. **Unless you have preloaded software on the SAS/SATA HDDs or SSDs, your server will not have an operating system, or any data. You will need to restore your data from backups, and install the operating system.**

    - To install the Solaris Operating System or Linux Operating System, see the *Sun Blade X6270 Server Module Linux, VMware, and Solaris Operating Systems Installation Guide* (820-6176).

    - To install the Windows Operating System, see the *Sun Blade X6270 Server Module Windows Operating System Installation Guide* (820-6177).

3.6.5.2 Replace a REM Card 4620A

With the cover off of the server module, determine whether the REM battery is attached directly onto the motherboard (see FIGURE 3-13, location 1) or on the REM card 4620A (see FIGURE 3-13, location 2).

▼ Replace a REM Card 4620A When the REM Battery Is Installed on the REM Card

1. **Remove the existing REM card by sliding it at an angle out of the support bracket. See** FIGURE 3-15**.**

2. **Swap the REM battery from the existing REM card to the new REM card.**

3. **Replace the REM card by sliding the new card at an angle into the support bracket, then pressing it carefully into its connector. See** FIGURE 3-15**.**

4. **Install the cover on the server.**

    For instructions, see "Install Cover on Server" on page 3-7.

▼ Replace a REM Card 4620A When the REM Battery Is Installed on the Motherboard

1. **Disconnect the REM card battery cable from the motherboard (see** FIGURE 3-14**).**

2. **Remove the existing REM card by sliding the card at an angle out of the support bracket. See** FIGURE 3-15**.**

3. **Reconnect the battery cable to the motherboard and the new REM card.**

4. **Replace the REM card by sliding it at an angle into the support bracket, then pressing it carefully into its connector. See** FIGURE 3-15**.**

5. **Install the cover on the server.**

   For instructions, see "Install Cover on Server" on page 3-7.

3.6.5.3   Replace a REM Battery

Caution – This component is a CRU and can be replaced by anyone. Follow the instructions in this section to ensure that the REM battery is properly installed. Proper installation is required to ensure adequate cooling of the battery.

The REM battery should be replaced when indicated in the *Sun StorageTek RAID Manager Software User's Guide* (820-1177). When replacing the REM battery, you will find the existing battery installed in one of two locations—on the REM card, or on the motherboard—as shown in FIGURE 3-13. Check your installation for the location of the battery.

- If the existing battery is installed on the REM card, install the replacement battery onto the REM card.
- If the existing battery is connected to the motherboard using the bracket which is located toward the front of the server module, install the replacement battery onto the bracket.

Follow these steps to replace the REM battery.

▼ Replace a REM Battery on the REM Card

1. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

2. **Disconnect the REM cable and remove the REM card from the chassis.**

3. **Remove the REM battery from the REM card by removing the four screws securing the old REM battery to the card.**

4. **Attach the new battery to the REM card with four screws.**

5. **Install the cover on the server.**

   For instructions, see "Install Cover on Server" on page 3-7.

▼ Replace a REM Battery on the Motherboard

1. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

2. **Remove the two screws securing the battery to the bracket (see** FIGURE 3-16**).**

3. **Place the new battery on bracket and attach it using the two screws.**

4. **Plug the battery cable into the motherboard.**

5. **Install the cover on the server.**

   For instructions, see "Install Cover on Server" on page 3-7.

FIGURE 3-16 REM Battery Attached to Bracket and Plugged Into Motherboard
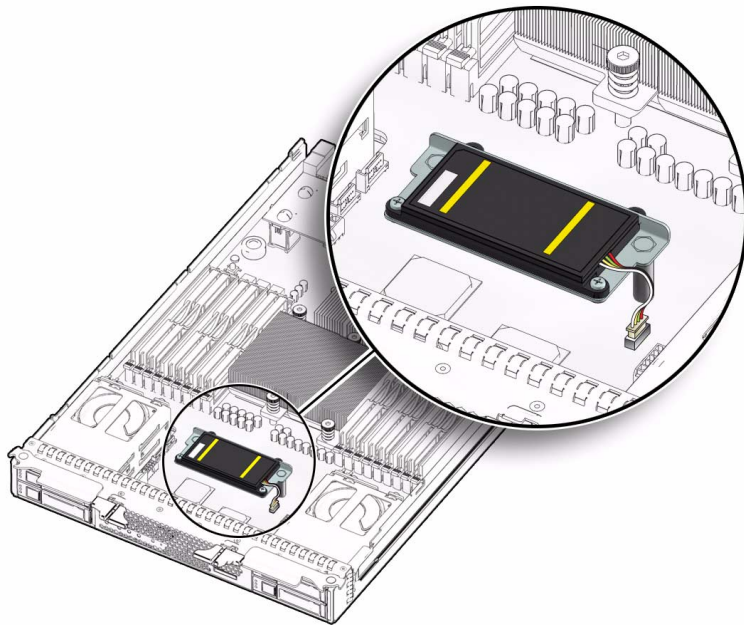
3.6.6　Adding or Replacing a Fabric Expansion Module

Follow these steps to remove and replace a Fabric Expansion Module (FEM) in a Sun Blade X6270 Server Module.

3.6.6.1　Replace or Add a FEM

Note – This component is a CRU and can be replaced by anyone.

Follow these steps to add or replace the FEM on the server.

1. **Power off the server and remove the server from the chassis.**

   For instructions, see:

   - "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
   - "Remove Server Module From Chassis" on page 3-5.

⚠️ **Caution –** After removing the server from the chassis insert a filler panel into an empty slot to reduce the possibility of a system shutdown.

2. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

3. **Perform one of the following:**

   - Remove the existing FEM board.

   or

   - Remove protective shipping cap from the FEM connector.

4. **Perform the following steps to install the FEM board:**

   a. **Slide the FEM board at an angle into the support bracket**

   b. **Press the FEM board carefully into the connector.**

      See FIGURE 3-17.

FIGURE 3-17 Inserting the FEM Board
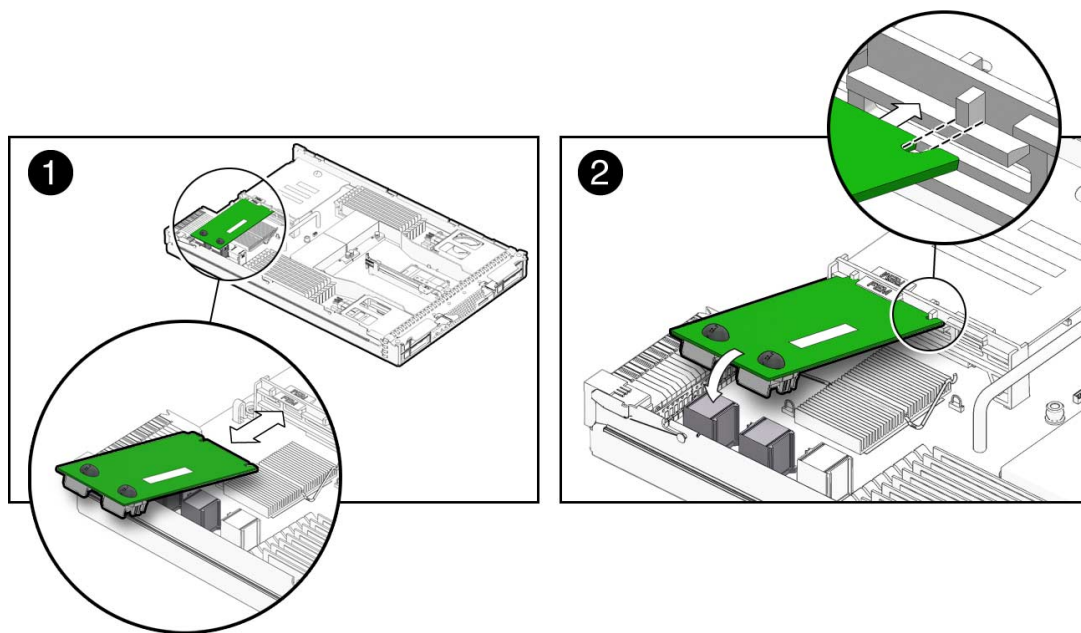
5. **Install the cover on the server.**

   For details, see "Install Cover on Server" on page 3-7.

3.6.7   Replacing or Upgrading the CPU

Note – This component is a FRU and should be replaced *only* by qualified service technicians. Contact your Sun service representative for assistance.

Follow these steps to replace a CPU and its heatsink in a Sun Blade X6270 Server Module.

1. **Power off the server and remove the server from the chassis.**

   For instructions, see:

   ■ "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3

   ■ "Remove Server Module From Chassis" on page 3-5.

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

2. **Remove the cover from the server.**

   For details, see "Remove or Install Server Cover" on page 3-7.

3. **To replace a faulty CPU, perform the following steps; otherwise, proceed to Step 4.**

   a. **Press the fault remind button on the motherboard to illuminate the LED for the CPU that has failed.**

      See FIGURE 3-18

      ▪ If CPU LED is off: CPU is operational.

      ▪ If CPU LED is lit (amber): CPU has encountered a fault condition and should be replaced.

FIGURE 3-18 Fault Remind Button Location
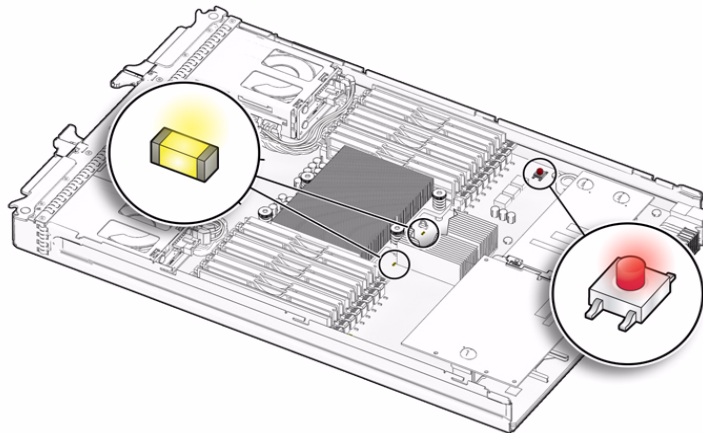
   b. **To remove the heatsink covering the faulty CPU, perform the following steps:**

      i. **Hold down the top of the heatsink to prevent it from tipping unevenly while you alternately loosen the spring-loaded mounting screws that secure the heatsink to the motherboard.**

      ii. **Turn the screws 180 degrees at a time, and then remove the screws when they are detached.**

         See FIGURE 3-19.

      iii. **Twist the heatsink slightly to lift it off the board. Turn the heatsink upside down and allow the spring in each of the mounting holes to fall out into your hand.**

FIGURE 3-19   Remove Heatsink and CPU
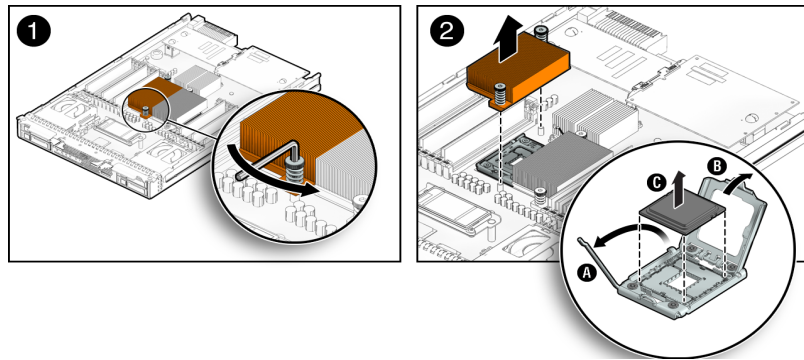
Note – Set the heatsink upside down on a clean, flat surface to prevent the thermal grease from contaminating other components.

    c. To remove the faulty CPU from the CPU socket, perform the following steps:

    See .

      i. Pivot the socket lever up, into the fully open position.

      ii. Open the hinged plate that covers the CPU until it is in the fully open position.

     iii. Lift the CPU out of the socket, leaving the lever and plate in the open position.

4. To install (or reinstall) a CPU, perform the following steps and see **.**

    a. Determine the CPU socket location to populate, then if you are replacing the existing CPU with a new CPU proceed to Step 4b; otherwise, perform one of the following tasks before proceeding to Step 4b:

      ▪ **Remove air baffle and filler panel in CPU socket**. If you are adding a second CPU to the motherboard for the first time and the CPU location is covered by an air baffle, you will need to remove the air baffle and the filler panel inside the CPU socket prior to adding the CPU. For instructions, see "Remove or Insert Filler Panels" on page 3-3.

    or

      ▪ **Clean old thermal grease from existing CPU**. If you are reinstalling the existing CPU, use an alcohol pad to clean all the old thermal grease from the component surface.

b. Ensure that the CPU socket release lever and retainer plate are in the fully open position then align the CPU with the CPU socket and gently set the CPU onto the pins in the socket.

Note – Use the alignment keys in the CPU socket to match the alignment notches on the sides of the CPU.

Note – Mixing CPU speeds is not supported. Install two identical CPUs in your server.

FIGURE 3-20 Install CPU and Heatstink
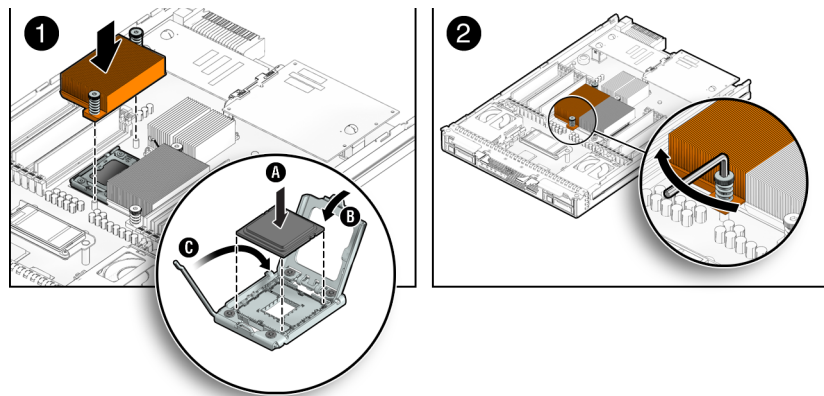
c. When the CPU is fully seated in the socket, pivot the hinged retainer plate down onto the top of the CPU.

See the insert in the first (1) figure shown in FIGURE 3-20.

d. Pivot the release lever down and into the locked position, at the side of the socket.

The release lever must lock down the retainer plate as you close the lever.

5. **To install (or reinstall) the heat sink over the CPU socket, perform the following steps.**

a. Use the syringe (supplied with the new or replacement CPU) to apply approximately 0.1 ml of thermal grease to the center of the top of the CPU. Do not distribute the grease.

Note – System cooling might be affected by dust and contaminant build-up. Therefore, you should open and check systems approximately every six months (or more often in dirty operating environments). Check system heatsinks, fans, and air openings. If necessary, clean systems by carefully brushing, blowing, or vacuuming contaminants from the system.

> **b. Turn the heatsink upright and reinsert the mounting screws.**
>
> See the second (2) figure shown in FIGURE 3-20.

Caution – Avoid moving the heatsink after it has contacted the top of the CPU. Too much movement could disturb the layer of thermal grease, leading to component damage.

> **c. Carefully position and align the heatsink over the CPU.**

Note – The heatsink is not symmetrical, and it must be aligned before you place it on the CPU.

> **d. Lower the heatsink onto the CPU, aligning the mounting screws with their holes on the motherboard.**
>
> **e. Using an allen wrench, alternately tighten the two heatsink mounting screws, 180 degrees at a time, until each spring is completely compressed.**
>
> Tighten the screws to 7 in.-lbs (0.8 Nm).

6. Reinstall the cover on the server.

For details, see Section t, "Install Cover on Server" on page 3-7.

3.6.8   Replacing Motherboard Enclosure

Note – This component is a FRU and should be replaced *only* by qualified service technicians. Contact your Sun Service representative for assistance.

To remove the motherboard enclosure from service or to return the motherboard enclosure to service, follow these steps:

1. To remove the motherboard enclosure from service, perform the following:

a. **Power off the server and remove the server from the chassis.**

For more information, see:

- "Power Off and Verify Server Is Ready for Removal From Chassis" on page 2-3
- "Remove Server Module From Chassis" on page 3-5

Caution – Do not operate the system with empty slots. Always insert a filler panel into an empty slot. If you continue to operate your system with an empty server module slot, the operating performance for your system could decline.

b. **Remove the cover from the server.**

For details, see "Remove or Install Server Cover" on page 3-7.

c. **Remove all replaceable components from the motherboard and place them on an antistatic surface.**

See FIGURE 3-21.

For instructions, see:

- "Replacing or Upgrading Memory Modules (DIMMs)" on page 3-18
- "Replacing or Upgrading the CPU" on page 3-34
- "Replacing or Adding a Hard Disk Drive" on page 3-11

Caution – You must return each HDD to the bay from which it was removed. Use an adhesive note or another method to temporarily label the HDDs after you remove them.

- "Adding a RAID Expansion Module" on page 3-26
- "Adding or Replacing a Fabric Expansion Module" on page 3-33

Note – The server module enclosure, the motherboard, and hard drive backplanes are all part of the motherboard FRU.

FIGURE 3-21 Remove Replaceable Components from Motherboard
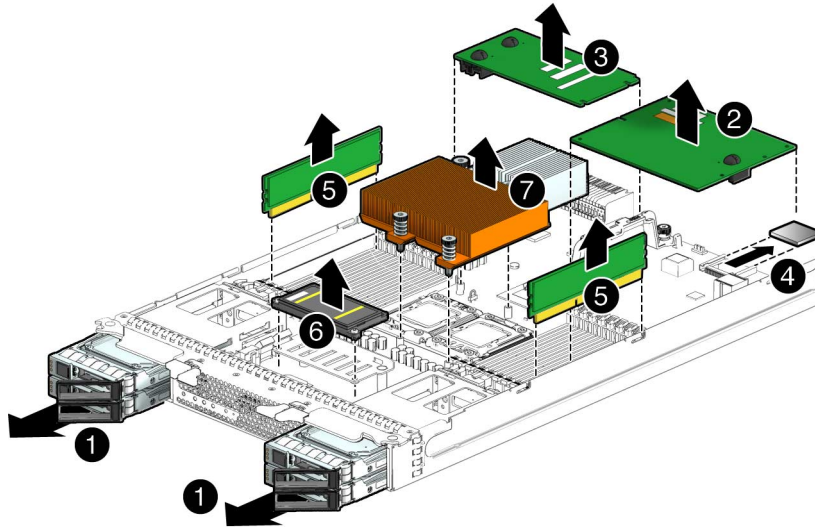
The motherboard enclosure is prepared for service.

2. **To return the motherboard enclosure to service, follow these steps:**

   a. **Reinstall the replaceable components on the motherboard.**

   For instructions for reinstalling the replaceable components, see the procedures referenced in Step 1c of this procedure; or see the procedures in the "Install Server Module Options" chapter in the *Sun Blade X6270 Server Module Installation Guide.*

Caution – If the HDDs contain RAID volumes, you should return each HDD to the bay from which it was removed. The RAID volumes will remain on the drives as long as the REM was not physically changed in this procedure.

---

   b. **Install the server cover.**

   For instructions, see "Remove or Install Server Cover" on page 3-7

   c. **Install the server module into a powered-on chassis.**

   For instructions, see "Install Server Module Into A Powered-On Chassis" in the *Sun Blade X6270 Server Module Installation Guide.*

   d. **Power on the server.**

   For instructions, see "Power On the Server Module" on page 2-2.

Troubleshooting the Server and Restoring ILOM Defaults

This chapter introduces the diagnostic tools you can use to troubleshoot or monitor the performance of your server. It also includes information about how to restore the SP password and serial connection defaults in ILOM, as well as how to restore your ILOM SP firmware.

4.1 Troubleshooting the Server

The Sun Blade X6270 Server Module and its accompanying software and firmware contain many diagnostic tools and features that can help you complete the following tasks:

- Isolate problems when a failure occurs on a customer replaceable-unit (CRU)
- Monitor the status of a functioning system
- Exercise the system to disclose more subtle problems that might be hardware related

Sun provides a suite of diagnostic tools, each of which has its own specific strengths and applications. For more information about which tool might be best to use for your purpose, and where to locate information about these tools, see:

- "Sun Diagnostic Tools" on page on page 4-2
- "Diagnostic Tool Documentation" on page on page 4-5

4.1.1 Sun Diagnostic Tools

Sun provides a wide selection of diagnostic tools for use with your server. These tools range from the SunVTS software, a comprehensive validation test suite, to log files in ILOM that might contain clues helpful in identifying the possible sources of a problem, and the fault management function in ILOM that enables you to identify a faulted component as soon as the fault occurs.

The diagnostic tools also include standalone software packages, firmware-based tests like power-on self-test (POST), U-Boot tests, or Pc-Check tests, and hardware LEDs that tell you when the system components are operating.

TABLE 4-1 summarizes the variety of diagnostic tools that you can use when troubleshooting or monitoring your server.

TABLE 4-1   Summary of Sun Diagnostic Tools

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Integrated Lights Out Manager (ILOM)	SP firmware	Monitors environmental conditions, generates alerts, performs fault isolation, and provides remote console access.	Can function on standby power and when the operating system is not running.	Designed for remote and local access.
Preboot Menu	SP firmware	Enables you to restore some of ILOM defaults (including firmware) when ILOM is not accessible.	Can function on standby power and when operating system is not running.	Local, but remote serial access is possible if the SP serial port is connected to a network-accessible terminal server.
LEDs	Hardware and SP firmware	Indicate status of overall system and particular components.	Available when system power is available.	Local, but sensor and indicators are accessible from ILOM web interface or command-line interface (CLI).
POST	Host firmware	Tests core components of system: CPUs, memory, and motherboard I/O bridge integrated circuits.	Runs on startup. Available when the operating system is not running.	Local, but can be accessed through ILOM Remote Console.
U-Boot	SP firmware	Initializes and test aspects of the service processor (SP) prior to booting the ILOM SP operating system. Tests SP memory, SP, network devices and I/O devices.	Can function on standby power and when operating system is not running.	Local, but remote serial access is possible if the SP serial port is connected to a network-accessible terminal server.

TABLE 4-1 Summary of Sun Diagnostic Tools *(Continued)*

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Pc-Check	SP firmware (or on Tools and Driver DVD for systems without SP)	DOS-based utility that tests all motherboard components (CPU, memory, and I/O), ports, and slots.	Runs on startup. Available when the operating system is not running.	Remote access through ILOM Remote Console for servers shipped with SP. or Local access for servers shipped without an SP (via Tools and Driver DVD).
Solaris commands	Operating system software	Displays various kinds of system information.	Requires operating system.	Local, and over network.
SunVTS	Diagnostic tool standalone software	Exercises and stresses the system, running tests in parallel.	Requires operating system. Install SunVTS software separately.	View and control over network.

4.1.2 Diagnostic Tool Documentation

TABLE 4-2 identifies where you can find more information about Sun diagnostic tools.

TABLE 4-2 Summary of Documentation for Sun Diagnostic Tools

Diagnostic Tool	Where to Find Information
ILOM	• *Sun Integrated Lights Out Manager 2.0 User's Guide.* • *Addendum to the Sun Integrated Lights Out Manager 2.0 User's Guide* • *Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Blade X6270 Server Module* Locate the latest version of these guides at: • http://docs.sun.com/app/docs/prod/blade.x6270
Preboot Menu	• Section 4.2, "Restoring ILOM Defaults" on page 4-6
LEDs; or System indicators and sensors	• *Sun Blade X6270 Server Module Service Manual* • *Sun Integrated Lights Out Manager 2.0 User's Guide* • *Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Blade X6270 Server Module* Locate the latest version of these guides at: • http://docs.sun.com/app/docs/prod/blade.x6270
POST	• Section 2.2, "About The BIOS" on page 2-6 • Section 2.2.1.1, "Default BIOS Power-On Self-Test (POST) Events" on page 2-7 • Section 2.2.1.2, "BIOS POST F1 and F2 Errors" on page 2-8 • Section 2.2.1.3, "How BIOS POST Memory Testing Works" on page 2-11
U-Boot or Pc-Check	• *Sun x64 Servers Diagnostics Guide* Locate the latest verson of this guide at: • http://docs.sun.com/app/docs/prod/blade.x6270
Solaris commands	Locate the latest Solaris command information for Solaris 10 at: • http://docs.sun.com/app/docs/doc/817-0550/eqxqt?a=view
Sun VTS	Download the Sun VTS software at: • http://sunsolve.com Locate the latest documentation for SunVTS at: • http://www.sun.com/oem/products/vts/index.html

4.2 Restoring ILOM Defaults

You can restore the factory defaults for the following ILOM features:

- ILOM root password
- Serial port connection

To restore these factory defaults, you must use the Preboot Menu utility that is shipped installed on your server. The Preboot Menu enables you to address changes to some of ILOM's settings while ILOM is not currently running. In addition to restoring factory defaults for the root password and serial connection settings, the Preboot Menu enables you to restore the SP firmware image on your system.

For more information about how to use the Preboot Menu to restore settings in ILOM, see these sections:

4.2.1 Accessing the Preboot Menu

To access the Preboot Menu, you must reset the SP and interrupt the boot process. You can interrupt the ILOM boot process by either:

- Using the Locate button on the local server.

  For details about the requirements for this local access method, see "Prerequisites for Accessing the Preboot Menu" on page on page 4-7.

Or

- Typing **xyzzy** during a pause in the bootstrap process from a remote serial terminal.

  For details about the requirements for this remote serial access method, see "Prerequisites for Accessing the Preboot Menu" on page on page 4-7.

Some Preboot Menu settings must be configured first, and until they are, you must use the Locate button method to access the Preboot Menu.

For detailed instructions for accessing the Preboot Menu from a local or remote connection, see the following sections:

Prerequisites for Accessing the Preboot Menu

Ensure that the applicable requirements are met prior to accessing the Preboot Menu from either a local or remote connection.

- For local access to the Preboot Menu (using Locate button)

  You must connect a terminal or console capable of running terminal emulation software to the serial port on the server using a dongle cable.

  For more information about how to attach local devices to the server using a dongle cable, see "Attaching Devices To the Server" on page on page 1-5.

  For instructions for accessing the Preboot Menu by using the Locate button, see "Access to the Preboot Menu" on page on page 4-8.

- For remote serial access to the Preboot Menu (typing **xyzzy** during bootstrap)

  Prior to accessing the Preboot Menu remotely, you must set the bootdelay and check_physical_presence settings in the Preboot Menu to enable remote serial access. To configure these settings for the first time, you need to:

  a. Access the Preboot Menu using the Locate button on the local server as described in "Access to the Preboot Menu" on page on page 4-8.

  b. Edit the settings in the Preboot Menu to enable remote access as described in "Edit Preboot Menu for Remote Serial Access" on page on page 4-9.

  c. Use a remote serial terminal or console running terminal emulation software to access the Preboot Menu remotely.

Note – You cannot use an SSH, or a remote KVMS session to access the Preboot Menu remotely.

▼ Access to the Preboot Menu

1. **Ensure that the requirements in** "Prerequisites for Accessing the Preboot Menu" on page on page 4-7 **are met.**

2. **Reset ILOM.**

   For example:

   - From the server SP ILOM, enter the command:

     ```
     -> reset /SP
     ```

   - From the CMM ILOM, enter the command:

     ```
     -> reset /CH/BLn/SP
     ```

     Where *n* is the slot number of the node.

   - Temporarily remove power from the server module by partially removing it from its slot, then reseating it.

   ILOM reboots and messages begin scrolling on the screen.

3. **To interrupt the ILOM boot process, perform one of the following actions when the SP is resetting:**

   - Press and hold the Locate button on the server module front panel, until the Preboot Menu appears.

   Or

   - Type in **xyzzy** when you see the message:

     ```
     Booting linux in n seconds...
     ```

Note – You cannot interrupt the ILOM boot process by typing **xyzzy** until you have configured the settings as described in "Edit Preboot Menu for Remote Serial Access" on page on page 4-9.

The ILOM Preboot Menu appears.

```
Booting linux in 10 seconds...

                    ILOM Pre-boot Menu
                    -----------------
Type "h" and [Enter] for a list of commands, or "?" [Enter] for
command-line key bindings.  Type "h cmd" for summary of 'cmd'
command.

Warning: SP will warm-reset after 300 seconds of idle time.
  Set 'bootretry' to -1 to disable the time-out.

Preboot>
```

4. **You can perform any of the following tasks or type** `boot` **to exit the Preboot Menu.**

- Enable remote access to the Preboot Menu.

  For instructions, see "Edit Preboot Menu for Remote Serial Access" on page on page 4-9.

- Restore the factory default to the ILOM root password.

  For instructions, see "Restore ILOM Root Password to Factory Default Using the Preboot Menu" on page on page 4-12.

- Restore the serial connection between ILOM and a host console.

  For instructions, see "Restore Access to the Serial Console Using the Preboot Menu" on page on page 4-13.

- Restore the SP firmware image.

  For instructions, see "Restore the SP Firmware Image Using the Preboot Menu" on page on page 4-19.

- Review the commands supported in the Preboot Menu.

  For command details, see "Preboot Menu Command Summary" on page on page 4-20.

▼ Edit Preboot Menu for Remote Serial Access

1. **Access the Preboot Menu as described in** "Access to the Preboot Menu" on page on page 4-8**.**

2. **At the** `Preboot>` **prompt, type** `edit`**.**

   The Preboot Menu enters edit mode.

   In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

   - To change a setting, type the new value, then press Enter.
   - To skip to the next setting, press Enter.

3. **Press Enter to move through the settings until the** `bootdelay` **setting appears.**

4. **To change the** `bootdelay` **setting, type** `3`**,** `10`**, or** `30`**, then press Enter.**

   This value (3, 10, or 30) specifies the number of seconds the SP boot process delays while waiting for your input.

   The Preboot Menu re-displays the `bootdelay` setting with the new value.

5. **Press Enter to return to Preboot Menu selections.**

   The Preboot Menu selections appear.

6. **Press Enter to move through the settings until the** check_physical_presence
   setting appears.

   To change the check_physical_presence setting, type no, then press Enter.

   The Preboot Menu displays the check_physical_presence setting with the
   new value.

7. **Press Enter for the new value to take effect.**

   The Preboot Menu asks you to confirm your changes.

   Enter 'y[es]' to commit changes: [no]

8. **Type** y **to save your changes and exit the edit session.**

   If you want to exit the edit session without saving your changes, type n.

   The following example shows an edit session where the bootdelay and
   check_physical_presence settings are changed.

Note – For a list of other settings you can edit in the Preboot Menu, see "Edit Mode
Settings in Preboot Menu." on page on page 4-11.

```
Preboot> edit

Press Enter by itself to reach the next question.
  Press control-C to discard changes and quit.

 Values for baudrate are {[ 9600 ]| 19200 | 38400 | 57600 | 115200
}.
  Set baudrate?               [9600]
 Values for serial_is_host are {[ 0 ]| 1 }.
  Set serial_is_host?         [0]
 Values for bootdelay are { -1 | 3 | 10 | 30 }.
  Set bootdelay?              [30] 10
  Set bootdelay?              [10]
 Values for bootretry are { -1 | 30 | 300 | 3000 }.
  Set bootretry?              [<not set>]
 Values for preferred are {[ 0 ]| 1 }.
  Set preferred?              [<not set>]
 Values for preserve_conf are {[ yes ]| no }.
  Set preserve_conf?          [yes]
 Values for preserve_users are {[ yes ]| no }.
  Set preserve_users?         [no]
 Values for preserve_password are {[ yes ]| no }.
  Set preserve_password?      [yes]
 Values for check_physical_presence are {[ yes ]| no }.
  Set check_physical_presence? [no] no
  Set check_physical_presence? [no]
```

```
  Enter 'y[es]' to commit changes: [no] y
 Summary: Changed 2 settings.
 Preboot>
```

Edit Mode Settings in Preboot Menu.

In addition to changing the settings required in the Preboot Menu to enable remote access, you can also change other edit mode settings in the Preboot Menu. For a list of these settings, see TABLE 4-3:

TABLE 4-3   Edit Mode Preboot Menu Command Settings

Setting	Description
baudrate	Sets the baudrate of the serial port. Selections include 9600,19200, 38400, 57600, and 115200.
serial_is_host	If this is set to 0, the serial port connects to the ILOM. If this is set to 1, the serial port connects to the host. For more details, see "Restoring ILOM Access to the Serial Console" on page on page 4-13.
bootdelay	The number of seconds the bootstrap process waits for the user to enter **xyzzy** before booting the SP. Selections include 3, 10, or 30.
bootretry	The number of seconds the Preboot Menu waits for user input before timing out and starting the SP. Set to -1 to disable the time-out.
preferred	Unused
preserve_conf	Setting this to no duplicates the function of the unconfig ilom_conf command, which resets many ILOM configuration settings, but preserves SP network, baudrate, and check_physical_presence the next time the SP is booted.
preserve_users	Setting this to no duplicates the function of the unconfig users command, which resets user information to the default values the next time the SP is booted.
preserve_ password	Setting this to no duplicates the function of the unconfig password command, which resets the root password to the default value the next time the SP is booted.
check_physical _presence	If this is set to Yes, you must press and hold the Locate button to interrupt the SP boot process. If it is set to No, the boot process prompts you to interrupt it. See "Edit Preboot Menu for Remote Serial Access" on page on page 4-9 for details.

4.2.2 Restoring the Factory Default ILOM Root Password

The ILOM root password grants you access to the ILOM web interface or command-line interface (CLI) on the SP or chassis monitoring module (CMM). If you forget the root password, you can use the Preboot Menu to restore the password to the factory default, changeme.

▼ Restore ILOM Root Password to Factory Default Using the Preboot Menu

1. **Access the Preboot Menu as described in** **.**

2. **In Preboot Menu, type:**

   ```
   Preboot> unconfig password
   ```

   ```
   Setting 'preserve_password' to 'no' for the next boot of ILOM.
   ```

3. **Reset the SP by typing:**

   ```
   Preboot> boot
   ```

   The Preboot Menu exits and the SP restarts.

   After restarting the ILOM SP, the value for the root password (on the ILOM SP and CMM) is set to changeme when the SP is finished booting.

4.2.3 Restoring ILOM Access to the Serial Console

In the event that the serial connection between ILOM and a host becomes unavailable, you can restore access to the serial port connection by reconfiguring the host as the external serial port owner in either the ILOM web interface or CLI, or in the Preboot Menu.

To determine which interface to use when restoring the serial connection between ILOM and a host console, consider the following:

- If a network connection is available, you should use the ILOM web interface or CLI to restore ILOM's access to the serial console.

  For instructions, see the procedure for "Switching Serial Port Output Between SP and Host Console" in the *Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement Guide for Sun Blade™ X6270 Server Module*.

- If a network connection is unavailable, you should use the procedure in "Restore Access to the Serial Console Using the Preboot Menu" on page on page 4-13 to restore ILOM access to the serial console.

▼ Restore Access to the Serial Console Using the Preboot Menu

1. **Access the Preboot Menu as described in** "Accessing the Preboot Menu" on page on page 4-6**.**

2. **At the** Preboot> **prompt, type** edit**.**

   The Preboot Menu enters edit mode.

   In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

   - To change a setting, type the new value, then press Enter.
   - To skip to the next setting, press Enter.

3. **Press Enter to move through the settings until the** serial_is_host **setting appears.**

   To change the serial_is_host setting, type **0**, and then press Enter.

   The Preboot Menu appears with the new value for the serial_is_host setting.

4. **Press Enter to display the Preboot Menu selections.**

   The Preboot Menu settings appear.

5. **Press Enter to scroll through the settings until the Preboot Menu asks you to confirm your changes.**

   ```
   Enter 'y[es]' to commit changes: [no]
   ```

6. **Type y to confirm your change and exit the edit session.**

   The preboot menu displays this message

   ```
   Summary: Changed 1 settings
   Preboot>
   ```

7. **To exit the Preboot Menu, type:** boot.

4.2.4 Restoring the SP Firmware Image

If ILOM is available, you should always use the ILOM web interface or CLI to restore the firmware image. For instructions about how to restore the firmware image using either the ILOM web interface or CLI, see the *Sun Integrated Lights Out Manager 2.0 User Guide* (820-1188). If ILOM is unavailable, you can use the Preboot Menu or IPMIflash to restore the SP firmware image.

To restore the SP firmware image using IPMIflash, see the *Addendum to the Sun Integrated Lights Out Manager 2.0 User's Guide* (820-4198) for more details.

Note – If you are unable to access ILOM to update the SP firmware image using either the ILOM interfaces or IPMIflash, you should contact a Sun service representative for assistance.

To restore the SP firmware image using the Preboot Menu, you must be a Sun qualified service technician to perform the procedure.

To use the Preboot Menu to restore the SP firmware image on the server, see the following sections:

- "Prerequisites for Restoring SP Firmware Using the Preboot Menu" on page on page 4-16
- "Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.x or Later" on page 16
- "Restore the SP Firmware Image Using the Preboot Menu" on page on page 4-19

4.2.4.1 Prerequisites for Restoring SP Firmware Using the Preboot Menu

The following requirements must be met prior to restoring the SP firmware on your server using the Preboot Menu.

- If your system is running ILOM firmware 2.0.2.x or later, you must enable the Preboot Menu to support the ability to restore the SP firmware. For more information on how to enable support in the Preboot Menu to recover the SP firmware, see "Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.x or Later" on page on page 4-16.

- You must be a Sun qualified service technician to perform this procedure.

- You must have a valid .flash firmware image file on a TFTP server.

Note – Restoring the SP firmware using the Preboot Menu requires a .flash file instead of a .pkg file that is typically used to update the SP using the ILOM interfaces.

4.2.4.2 Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.x or Later

As of ILOM 2.0.2.x, you must enable support in the Preboot Menu to recover the SP firmware image prior to performing the steps in "Restore the SP Firmware Image Using the Preboot Menu" on page on page 4-19.

To enable support in the Preboot Menu to recover SP firmware 2.0.2x or later, follow these steps.

1. **Prepare the server for service by powering down the server, removing the server module from the system chassis, then removing the server cover.**

   For instructions, see the following sections:

   - "Powering On and Off the Server" on page on page 2-2
   - "Remove Server Module From Chassis" on page on page 3-5
   - "Remove or Install Server Cover" on page on page 3-7

2. **Locate the J602 pins on the server module then place a jumper on pins 2 and 3. See** FIGURE 4-1**.**

FIGURE 4-1 Placing Jumper on Pins
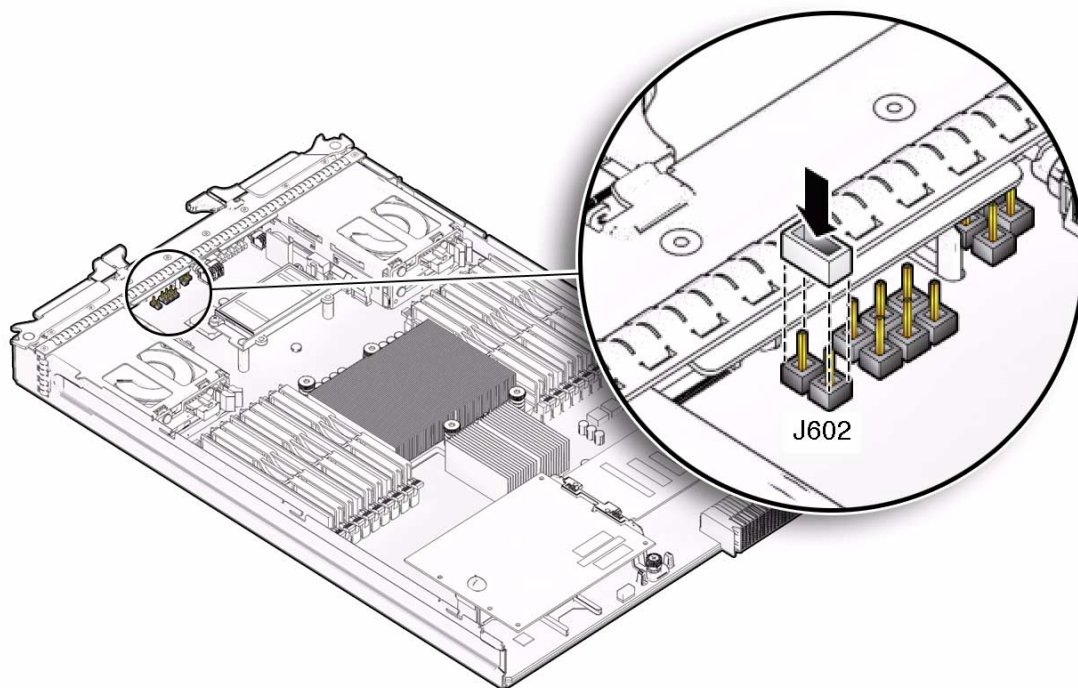
3. **Replace the top cover, return the server module to the system chassis and power-on the server.**

   For instructions, see the following sections:

   - "Remove or Install Server Cover" on page on page 3-7

   - Installing the Server Module Into System Chassis in the *Sun Blade X6270 Server Module Installation Guide* (820-6175).

   - "Powering On and Off the Server" on page on page 2-2

4. **Follow the instructions for restoring the SP firmware using the Preboot Menu in** Section 4.2.4.3, "Restore the SP Firmware Image Using the Preboot Menu" on page 4-19.

Note – The Preboot Menu firmware recovery process must be performed by a Sun qualified service technician and you must have a valid `.flash` file to perform the procedure.

---

5. **After you restore the SP image using the Preboot menu, perform the following steps to remove the J602 jumper from the server and to return the server to normal operation.**

   a. **Power off the server module.**

      See Section 2.1, "Powering On and Off the Server" on page 2-2.

   b. **Remove the server module from the chassis.**

      See "Remove Server Module From Chassis" on page on page 3-5

   c. **Remove the top cover from the server.**

      See Section 3.4.2, "Remove or Install Server Cover" on page 3-7.

   d. **Remove the jumper from J602.**

   e. **Replace the top cover.**

   f. **Return the server module into the chassis.**

   g. **Power on the server.**

      See Section 2.1.1, "Power On the Server Module" on page 2-2.

4.2.4.3   Restore the SP Firmware Image Using the Preboot Menu

To restore the SP firmware image using the Preboot Menu, follow these steps:

1. **Access the Preboot Menu as described in** "Accessing the Preboot Menu" on page on page 4-6**.**

2. **At the** `Preboot>` **prompt, type:**

Caution – The use of the `net flash` command is reserved for use by Sun service personnel only.

> **net flash** *IPaddress path/name***.flash**
>
> where:
>
> - *IPaddress* is the IP address of a TFTP server
> - *path* is the path to the file relative to `/tftpboot`
> - *name* is the first part of the `.flash` file filename
>
> For example:
>
> `Preboot>` **net flash 10.8.173.25 images/system-rom.flash**
>
> After a series of messages, the Preboot Menu prompt appears.
>
> `Preboot>`

3. **At the** `Preboot>` **prompt**, **type the** `reset` **command to restart the SP.**

   For example:

   `Preboot>` **reset**

   The Preboot Menu exits and ILOM restarts.

4.2.5 Preboot Menu Command Summary

TABLE 4-4 identifies the Preboot Menu commands.

TABLE 4-4 Preboot Menu Commands

Command	Description
boot	Boots ILOM. The Preboot Menu exits and ILOM restarts. **Note -** This command executes a modified boot sequence that does not offer the choice to select the diagnostic level, or to interrupt the boot sequence and return to the Preboot Menu. To execute the normal boot sequence, use the reset warm command instead.
vers	Displays version information including the hardware type, board revision, ILOM revision, revisions of PBSW and recovery U-Boot. Shows the checksum integrity of the images, and the preference between redundant images.
help	Displays a list of commands and parameters.
show	Displays a list of SP settings.
edit	Starts an interactive dialog that prompts and changes settings one-by-one. See "Edit Preboot Menu for Remote Serial Access" on page on page 4-9 for details.
diag	Runs the U-Boot diagnostic tests in manual mode. See the *Sun X64 Servers Diagnostics Guide* for more on U-Boot diagnostic tests.
host	Initiates various activities related to the host. • clearcmos – Clears CMOS and BIOS passwords. • console – Connects SP console to host serial console. **Note -** Type Ctrl \ q to quit. • show – Shows information about the host state. • enable-on – Enables the front-panel Power button, which is usually disabled unless ILOM is running. **Caution -** If you start the host when ILOM is off, the BIOS does not send error events, or power messages to the SP. This can cause all server modules to lose power. • hard-off – Turns the host off.

TABLE 4-4   Preboot Menu Commands *(Continued)*

Command	Description
net	`{ config	dhcp	ping	flash }`  • `config` – Starts a dialog that enables you to change the ILOM network settings. • `dhcp` – Changes the network addressing from static to DHCP.  **Note -** You must set `ipdiscovery = dhcp` using the `net config` command first.  • `ping` – Sends a ping. • `flash` – Downloads an ILOM firmware image. See "Restoring the SP Firmware Image" on page on page 4-15 for details. Type **help net** *command* for more details on these commands.
reset	`{ warm	cold }`. Resets the SP and the host.  • `warm` – Resets the SP without affecting a running host. • `cold` – Resets the SP and the host. It has the effect of powering off the server module.
unconfig	`{ users	ilom_conf	most	all }`  Causes ILOM to erase any configuration information and returns the values to defaults the next time ILOM boots.  • `users` – Resets all configured user information. • `password` –Resets the ILOM root password to the default. See "Restoring the Factory Default ILOM Root Password" on page on page 4-12 for more details. • `ilom_conf` – Resets configuration settings but preserves SP network and `baudrate`, `preferred`, and `check_physical_presence`. • `most` – Resets the SP data storage, but preserves network and baud rate, preferred, and `check_physical_presence` settings. • `all` – Resets all SP data storage and settings. Booting ILOM restores other defaults. **Note -** None of these options erases the dynamic FRU PROMs.

Server Module Specifications

This appendix contains physical specifications for the Sun Blade X6270 Server Module. Refer to the chassis documentation for additional server module specifications.

A.1 Physical Specifications

The Sun Blade X6270 Server Module is designed to be installed in a Sun Blade 6000 or 6048 Modular System chassis. For additional specifications regarding the Sun Blade 6000 or 6048 Modular System, refer to the chassis documentation.

TABLE A-1 gives the physical specifications for the Sun Blade X6270 Server Module.

TABLE A-1   Sun Blade X6270 Server Module Physical Specifications

	English	Metric
Height	12.87 inches	327 mm
Width	1.7 inches	44 mm
Depth	20.16 inches	512 mm
Weight	17 pounds	7.71 kg

A.2 Electrical Specifications

The Sun Blade X6270 Server Module is 12.9 x 20.1 x 1.7 inches in a 1U form factor. The server module connects to a Sun Blade Modular System, or *chassis*, which provides 12V main power to each module, as well as cooling through fans. In addition to the 12V main power, the chassis provides 3.3V AUX power to each server module to power the local FRU ID EEPROM. This 3.3V AUX power enables the chassis monitoring module (CMM) to query each server module slot prior to 12V main power and 12V fan power application to validate that there is sufficient power and cooling to support the server modules installed in the chassis.

A.3 Environmental Requirements

TABLE A-2 gives the environmental requirements for the Sun Blade X6270 Server Module.

TABLE A-2   Sun Blade X6270 Server Module Environmental Requirements

Condition	Requirement
Operating temperature	5 ºC to 35 ºC noncondensing
Nonoperating temperature	-40 ºC to 65 ºC
Operating humidity	10% to 90% noncondensing (27 ºC max. wet bulb)
Nonoperating humidity	93% noncondensing (38 ºC max. wet bulb)
Operating altitude	3048 meters at 35 ºC
Nonoperating altitude	12,000 meters

BIOS Setup Utility Menus

When necessary, refer to the following menu selections available in the BIOS Setup Utility.

Note – The BIOS menus shown in this appendix are examples. The BIOS version numbers, menu information, and menu selections are subject to change over the life of the product.

- Section B.1, "BIOS Main Menu Selections" on page B-2
- Section B.2, "BIOS Advanced Menu Selections" on page B-2
- Section B.3, "BIOS PCI Menu Selections" on page B-10
- Section B.4, "BIOS Boot Menu" on page B-10
- Section B.5, "BIOS Security Menu" on page B-14
- Section B.6, "BIOS Chipset Menu Settings" on page B-14
- Section B.7, "BIOS Exit Menu" on page B-17

B.1 BIOS Main Menu Selections

```
                          BIOS SETUP UTILITY
 Main     Advanced    PCI     Boot     Security     Chipset     Exit

 System Overview                                    Use [ENTER], [TAB]
 ─────────────────────────────────────────────     or [SHIFT-TAB] to
 AMIBIOS                                            select a field.
 Build Date:02/25/09
 ID         :07.01.38.03                            Use [+] or [-] to
                                                    configure system Time.
 Processor
 Intel(R) Xeon(R) CPU        E5520  @ 2.27GHz
 Speed      :2266MHz
 Count      :16

 System Memory
 Size       :4088MB                                 ←     Select Screen
                                                    ↑↓     Select Item
 System Time             [07:17:32]                 +-     Change Field
 System Date             [Tue 03/10/2009]           Tab    Select Field
                                                    F1     General Help
 ► Serial Number Information                        (CTRL+Q from remote kbd)
                                                    F10    Save and Exit
                                                    (CTRL+S from remote kbd)

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```

B.2 BIOS Advanced Menu Selections

Refer to the following sections to view the BIOS Advanced menu selections.

- Section B.2.0.1, "BIOS Advanced Menu Main" on page B-3
- Section B.2.0.2, "BIOS Advanced Menu CPU Configuration" on page B-3
- Section B.2.0.3, "BIOS Advanced Menu On-board SATA Configuration" on page B-4
- Section B.2.0.4, "BIOS Advanced Menu ACPI Configuration" on page B-4
- Section B.2.0.5, "BIOS Advanced Menu Event Logging Details" on page B-5
- Section B.2.0.6, "BIOS Advanced Menu IPMI Configuration" on page B-6
- Section B.2.0.8, "BIOS Advanced Menu LAN Configuration" on page B-7
- Section B.2.0.9, "BIOS Advanced Menu MPS Configuration" on page B-8
- Section B.2.0.10, "BIOS Advanced Menu Remote Access Configuration" on page B-8
- Section B.2.0.11, "BIOS Advanced Menu Trusted Computing" on page B-9
- Section B.2.0.12, "BIOS Advanced Menu USB Configuration" on page B-9

B.2.0.1 BIOS Advanced Menu Main

```
                        BIOS SETUP UTILITY
 Main    Advanced   PCI    Boot    Security    Chipset    Exit

 Advanced Settings                                  Configure CPU.

 WARNING: Setting wrong values in below sections
          may cause system to malfunction.

 ▶ CPU Configuration
 ▶ On-board SATA Configuration
 ▶ ACPI Configuration
 ▶ Event Log Configuration
 ▶ IPMI Configuration
 ▶ Intel VT-d Configuration
 ▶ MPS Configuration
 ▶ Remote Access Configuration              ←    Select Screen
 ▶ Trusted Computing                        ↑↓   Select Item
 ▶ USB Configuration                        Enter Go to Sub Screen
                                            F1    General Help
                                            (CTRL+Q from remote kbd)
                                            F10   Save and Exit
                                            (CTRL+S from remote kbd)
                                            ESC   Exit

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```

B.2.0.2 BIOS Advanced Menu CPU Configuration

```
                        BIOS SETUP UTILITY
         Advanced

 Configure advanced CPU settings                    For UP platforms,
                                                    leave it enabled.
 Manufacturer:Intel                                 For DP/MP servers,
 Intel(R) Xeon(R) CPU          E5520  @ 2.27GHz     it may use to tune
 Frequency   :2.26GHz                               performance to the
 BCLK Speed  :133MHz                                specific application.
 Cache L1    :128 KB
 Cache L2    :1024 KB
 Cache L3    :8192 KB
 Ratio Status:Unlocked (Min:12, Max:17)
 Ratio Actual Value:17
 CPU Power (TDP Limit):80 Watts
                                            ←    Select Screen
 Hardware Prefetcher        [Enabled]       ↑↓   Select Item
 Adjacent Cache Line Prefetch [Enabled]     +-   Change Option
 Intel(R) Virtualization Tech  [Enabled]    F1    General Help
 Execute-Disable Bit Capability [Enabled]   (CTRL+Q from remote kbd)
 Intel(R) HT Technology     [Enabled]       F10   Save and Exit
 Active Processor Cores     [All]           (CTRL+S from remote kbd)
 Intel(R) SpeedStep(tm) tech [Enabled]      ESC   Exit

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```

B.2.0.3 BIOS Advanced Menu On-board SATA Configuration

```
                          BIOS SETUP UTILITY
        Advanced

 On-board SATA Configuration                              Options

    Configure SATA#1 as           [AHCI]              IDE
                                                      AHCI

  ▶ AHCI Port0 [Not Detected]
  ▶ AHCI Port1 [Not Detected]
  ▶ AHCI Port2 [Hard Disk]
  ▶ AHCI Port3 [Hard Disk]
  ▶ AHCI Port4 [Not Detected]
  ▶ AHCI Port5 [Not Detected]


                                            ←      Select Screen
                                            ↑↓     Select Item
                                            +-     Change Option
                                            F1     General Help
                                            (CTRL+Q from remote kbd)
                                            F10    Save and Exit
                                            (CTRL+S from remote kbd)
                                            ESC    Exit

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```

B.2.0.4 BIOS Advanced Menu ACPI Configuration

```
                          BIOS SETUP UTILITY
        Advanced

 ACPI Settings                                       Advanced ACPI
                                                     Configuration settings
  ▶ Advanced ACPI Configuration
                                                     Use this section to
                                                     configure additional
                                                     ACPI options.




                                            ←      Select Screen
                                            ↑↓     Select Item
                                            Enter Go to Sub Screen
                                            F1     General Help
                                            (CTRL+Q from remote kbd)
                                            F10    Save and Exit
                                            (CTRL+S from remote kbd)
                                            ESC    Exit

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```

Advanced ACPI Configuration Sub Menu


```
                            BIOS SETUP UTILITY
      Advanced

   Advanced ACPI Configuration                          Selects ACPI version
                                                        supported by BIOS.
   ACPI Version Features           [ACPI v3.0]
   ACPI APIC support               [Enabled]
   AMI OEMB table                  [Enabled]
   Headless mode                   [Enabled]
   ACPI SRAT Table                 [Enabled]
   EMS support(SPCR)               [Disabled]




                                                     ←    Select Screen
                                                     ↑↓   Select Item
                                                     +-   Change Option
                                                     F1   General Help
                                                     (CTRL+Q from remote kbd)
                                                     F10  Save and Exit
                                                     (CTRL+S from remote kbd)
                                                     ESC  Exit

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```

B.2.0.5   BIOS Advanced Menu Event Logging Details


```
                            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
                                                     (CTRL+Q from remote kbd)
                                                     F10  Save and Exit
                                                     (CTRL+S from remote kbd)
                                                     ESC  Exit

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```

B.2.0.6   BIOS Advanced Menu IPMI Configuration

```
                        BIOS SETUP UTILITY
       Advanced

 IPMI Configuration                                  View all events in the
 ────────────────────────────────────────────       BMC Event Log.
 Status Of BMC              Working                  It will take a max. of
 ▶ View BMC System Event Log                         15 seconds to read all
 Clear BMC System Event Log                          BMC SEL records.
 ▶ Set LAN Configuration




                                                     ←    Select Screen
                                                     ↑↓    Select Item
                                                     Enter Go to Sub Screen
                                                     F1    General Help
                                                     (CTRL+Q from remote kbd)
                                                     F10   Save and Exit
                                                     (CTRL+S from remote kbd)
                                                     ESC   Exit

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```

View BMC Event Log Sub Menu

```
                        BIOS SETUP UTILITY
       Advanced

 Total Number Of Entries:       909                  Use +/- to traverse
 ────────────────────────────────────────────       the event log.
 SEL Entry Number:             [  1]
 SEL Record ID:                1C56
 SEL Record Type:              02 (System Event)
 Event Timestamp:              Feb 26, 2009 22:23:39
 Generator ID:                 0020
 Event Message Format Ver:     04 (IPMI ver 1.5)
 Event Sensor Type:            08 (Power Supply)
 Event Sensor Number:          8D
 Event Dir Type:               03
 Event Data:                   00 FF FF
                                                     ←    Select Screen
                                                     ↑↓    Select Item
                                                     +-    Change Option
                                                     F1    General Help
                                                     (CTRL+Q from remote kbd)
                                                     F10   Save and Exit
                                                     (CTRL+S from remote kbd)
                                                     ESC   Exit

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```

B.2.0.7 BIOS Advanced Intel VT-d Configuration

```
                          BIOS SETUP UTILITY
      Advanced
 _____    _____
                                                      |      Options      |
 Intel VT-d                    [Enabled]
                                                      Disabled
                                                      Enabled




                                                      ←     Select Screen
                                                      ↑↓    Select Item
                                                      +-    Change Option
                                                      F1    General Help
                                                      (CTRL+Q from remote kbd)
                                                      F10   Save and Exit
                                                      (CTRL+S from remote kbd)
                                                      ESC   Exit

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```

B.2.0.8 BIOS Advanced Menu LAN Configuration

```
                          BIOS SETUP UTILITY
           Advanced
 _____   _____
 LAN Configuration.                                      Enter channel number
 _____     for SET LAN Config
 Channel Number                [01]                      Command.
 IP Assignment                 [Static]                  Proper value below 16.

 Current IP address in BMC:    010.008.187.077
 Current MAC address in BMC:   00.14.4F.CA.58.66
 Current Subnet Mask in BMC:   255.255.255.000
 Current Gateway in BMC:       010.008.187.254
 Current Active Management Port  NET MGT

 Refresh
                                                         ←     Select Screen
 IP Address                    [010.008.187.077]        ↑↓    Select Item
 Subnet Mask                   [255.255.255.000]        Enter Update
 Default Gateway               [010.008.187.254]        F1    General Help
                                                        (CTRL+Q from remote kbd)
 Active Management Port        [NET MGT]                F10   Save and Exit
                                                        (CTRL+S from remote kbd)
 Commit                                                 ESC   Exit

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```

B.2.0.9 BIOS Advanced Menu MPS Configuration

```
                        BIOS SETUP UTILITY
      Advanced

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




                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               (CTRL+Q from remote kbd)
                                               F10   Save and Exit
                                               (CTRL+S from remote kbd)
                                               ESC   Exit

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```

B.2.0.10 BIOS Advanced Menu Remote Access Configuration

```
                        BIOS SETUP UTILITY
      Advanced

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

 Serial port number            [COM1]
     Base Address, IRQ         [3F8h, 4]
 Serial Port Mode              [09600,8,n,1]
 Flow Control                  [None]
 Redirection After BIOS POST   [Always]
 Terminal Type                 [ANSI]
 VT-UTF8 Combo Key Support     [Enabled]
 Sredir Memory Display Delay   [No Delay]
                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               (CTRL+Q from remote kbd)
                                               F10   Save and Exit
                                               (CTRL+S from remote kbd)
                                               ESC   Exit

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```

B.2.0.11 BIOS Advanced Menu Trusted Computing

```
                        BIOS SETUP UTILITY
        Advanced

 Trusted Computing                                  Enable/Disable TPM
 ─────────────────────────────────────────────     TCG (TPM 1.1/1.2) supp
 TCG/TPM SUPPORT                    [No]            in BIOS








                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    +-   Change Option
                                                    F1   General Help
                                                    (CTRL+Q from remote kbd)
                                                    F10  Save and Exit
                                                    (CTRL+S from remote kbd)
                                                    ESC  Exit

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```

B.2.0.12 BIOS Advanced Menu USB Configuration

```
                        BIOS SETUP UTILITY
        Advanced

 USB Configuration
 ─────────────────────────────────────────────

 USB Devices Enabled :
   2 Keyboards, 2 Mice, 4 Hubs








                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    F1   General Help
                                                    (CTRL+Q from remote kbd)
                                                    F10  Save and Exit
                                                    (CTRL+S from remote kbd)
                                                    ESC  Exit

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```

B.3 BIOS PCI Menu Selections

```
                         BIOS SETUP UTILITY
   Main    Advanced   PCI    Boot    Security   Chipset   Exit

   Advanced PCI Settings                          Clear NVRAM during
                                                  System Boot.
   WARNING: Setting wrong values in below sections
            may cause system to malfunction.

   Clear NVRAM                    [No]



                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  (CTRL+Q from remote kbd)
                                                  F10   Save and Exit
                                                  (CTRL+S from remote kbd)
                                                  ESC   Exit

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```

B.4 BIOS Boot Menu

Refer to the following sections to view the BIOS Boot menu selections.

- Section B.4.0.1, "BIOS Boot Menu Main" on page B-11
- Section B.4.0.2, "BIOS Boot Menu Boot Settings Configuration" on page B-11
- Section B.4.0.3, "BIOS Boot Menu Boot Device Priority" on page B-12
- Section B.4.0.4, "BIOS Boot Menu Option ROM" on page B-12
- Section B.4.0.5, "BIOS Boot Menu Wake On LAN" on page B-13

B.4.0.1 BIOS Boot Menu Main

B.4.0.2 BIOS Boot Menu Boot Settings Configuration

B.4.0.3 BIOS Boot Menu Boot Device Priority

```
                          BIOS SETUP UTILITY
                    Boot

 Boot Device Priority                              Specifies the boot
                                                   sequence from the
 1)   [HDD:P0-FUJITSU MHY2200BSSUN200G 074]        available devices.
 2)   [HDD:P1-FUJITSU MHV5480SBSUN80G 060]
 3)   [PXE:IBA GE Slot 1F01 v1324]                 A device enclosed in
 4)   [PXE:IBA GE Slot 1F00 v1324]                 parenthesis has been
 5)   [PXE:Slot0.F1:IBA GE Slot 0D01 v1230]        disabled in the
 6)   [PXE:Slot0.F0:IBA GE Slot 0D00 v1230]        corresponding type
                                                   menu.



                                                   ←    Select Screen
                                                   ↑↓   Select Item
                                                   +-   Change Option
                                                   F1   General Help
                                                   (CTRL+Q from remote kbd)
                                                   F10  Save and Exit
                                                   (CTRL+S from remote kbd)
                                                   ESC  Exit

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```

B.4.0.4 BIOS Boot Menu Option ROM

```
                          Boot

 NET0 Option ROM:            [Enabled]             This Option enables
 NET1 Option ROM:            [Enabled]             execution of the
 PCI-E Slot 0 Option ROM:    [Enabled]             onboard network
 PCI-E Slot 1 Option ROM:    [Enabled]             controllers' Optional
 RAID Expansion Module:      [Enabled]             ROMs for legacy
 Fabric Expansion Module 0:  [Enabled]             support. The onboard
 Fabric Expansion Module 1:  [Enabled]             network devices are
                                                   not bootable with this
                                                   disabled.



                                                   ←    Select Screen
                                                   ↑↓   Select Item
                                                   +-   Change Option
                                                   F1   General Help
                                                   (CTRL+Q from remote kbd)
                                                   F10  Save and Exit
                                                   (CTRL+S from remote kbd)
                                                   ESC  Exit

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```
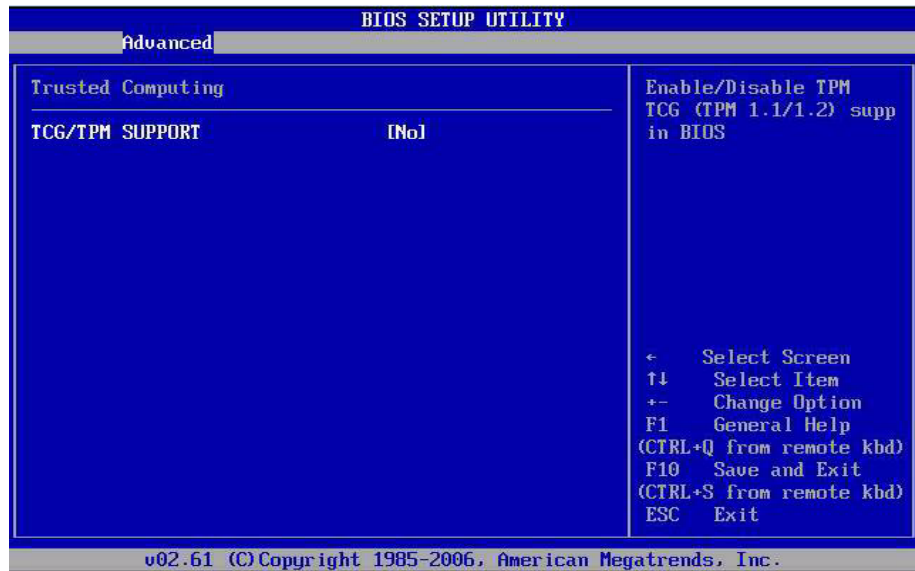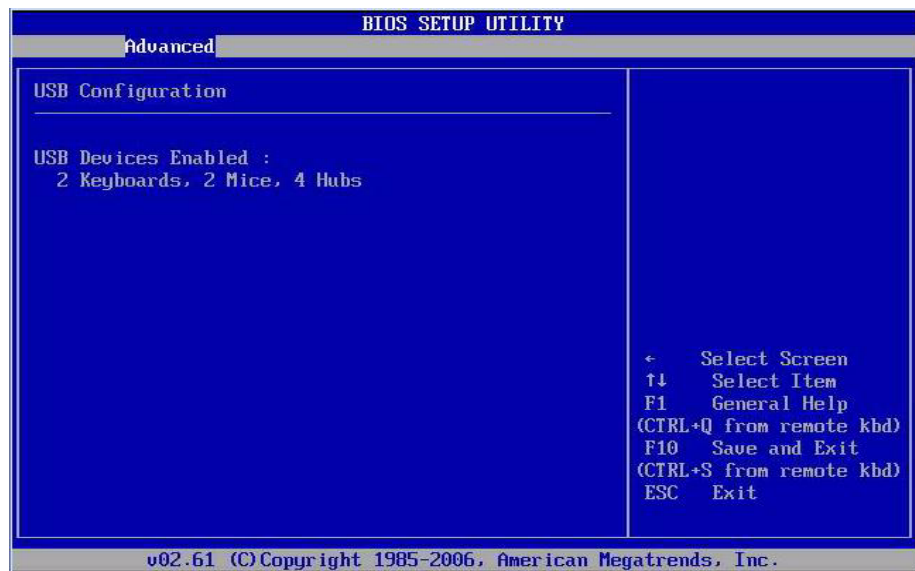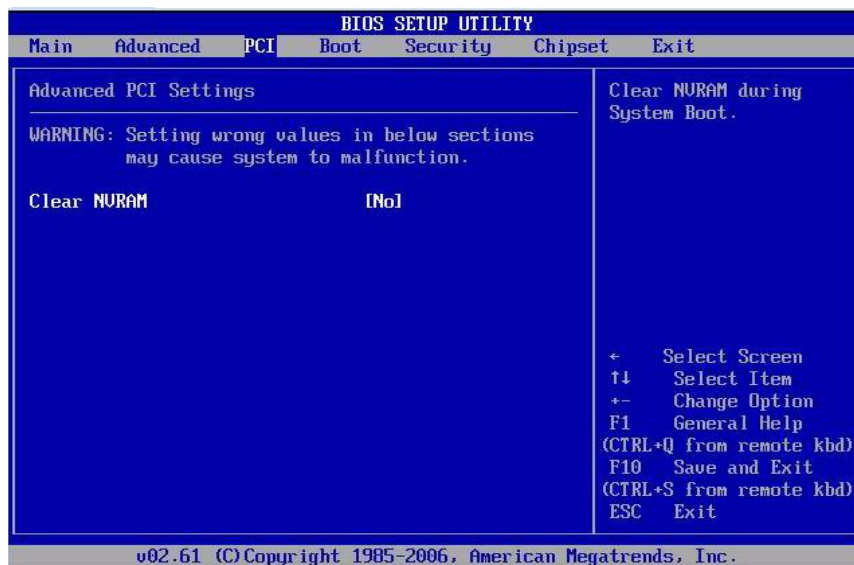
B.4.0.5   BIOS Boot Menu Wake On LAN

```
                              Boot
─────────────────────────────────────────────────────┬──────────────────────
 NET0 Wake On LAN              [Enabled]               │       Options
 NET1 Wake On LAN              [Enabled]               │
                                                       │ Disabled
                                                       │ Enabled
                                                       │
                                                       │
                                                       │
                                                       │
                                                       │
                                                       │
                                                       │ ←     Select Screen
                                                       │ ↑↓    Select Item
                                                       │ +-    Change Option
                                                       │ F1    General Help
                                                       │ (CTRL+Q from remote kbd)
                                                       │ F10   Save and Exit
                                                       │ (CTRL+S from remote kbd)
                                                       │ ESC   Exit
─────────────────────────────────────────────────────┴──────────────────────
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```

B.5   BIOS Security Menu

```
                     BIOS SETUP UTILITY
 Main    Advanced    PCI    Boot    Security    Chipset    Exit
──────────────────────────────────────────────────┬──────────────────────────
 Security Settings                                 │ Install or Change the
 ─────────────────                                 │ password.
 Supervisor Password :Not Installed                │
 User Password       :Not Installed                │
                                                   │
 Change Supervisor Password                        │
 Change User Password                              │
                                                   │
                                                   │
                                                   │
                                                   │
                                                   │
                                                   │
                                                   │ ←     Select Screen
                                                   │ ↑↓    Select Item
                                                   │ Enter Change
                                                   │ F1    General Help
                                                   │ (CTRL+Q from remote kbd)
                                                   │ F10   Save and Exit
                                                   │ (CTRL+S from remote kbd)
                                                   │ ESC   Exit
──────────────────────────────────────────────────┴──────────────────────────
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```
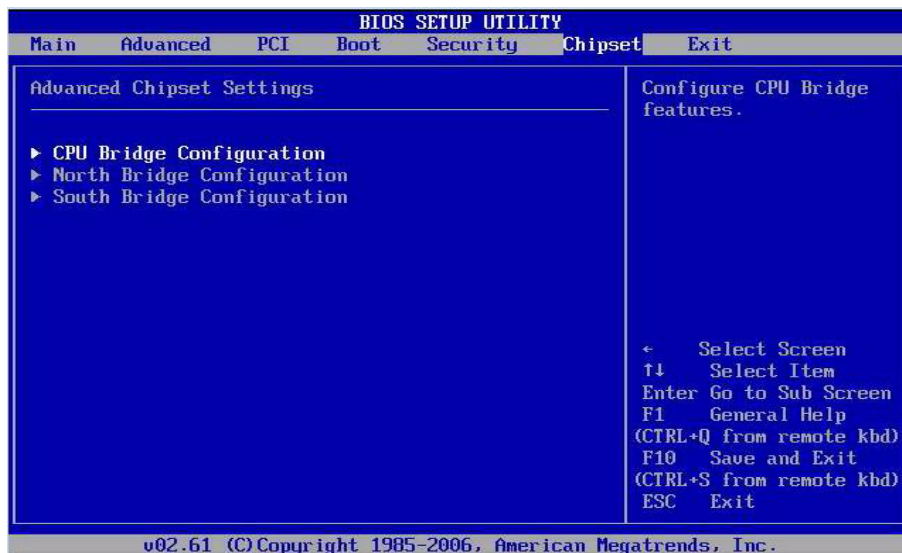
B.6 BIOS Chipset Menu Settings

Refer to the following sections to view the BIOS Chipset menu selections.

B.6.0.1 BIOS Chipset Main Menu

```
                        BIOS SETUP UTILITY
 Main    Advanced    PCI    Boot    Security   Chipset    Exit

 Advanced Chipset Settings                      Configure CPU Bridge
                                                features.

 ▶ CPU Bridge Configuration
 ▶ North Bridge Configuration
 ▶ South Bridge Configuration



                                                ←     Select Screen
                                                ↑↓    Select Item
                                                Enter Go to Sub Screen
                                                F1    General Help
                                                (CTRL+Q from remote kbd)
                                                F10   Save and Exit
                                                (CTRL+S from remote kbd)
                                                ESC   Exit

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```

B.6.0.2 BIOS Chipset Menu CPU Bridge Configuration

```
                        BIOS SETUP UTILITY
                                                Chipset

CPU Bridge Chipset Configuration

CPU Revision              :D0
Current QPI Frequency     :5.8GT/s
Current Memory Frequency  :1066 Mhz


                                        ←     Select Screen
                                        ↑↓    Select Item
                                        F1    General Help
                                        (CTRL+Q from remote kbd)
                                        F10   Save and Exit
                                        (CTRL+S from remote kbd)
                                        ESC   Exit


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```
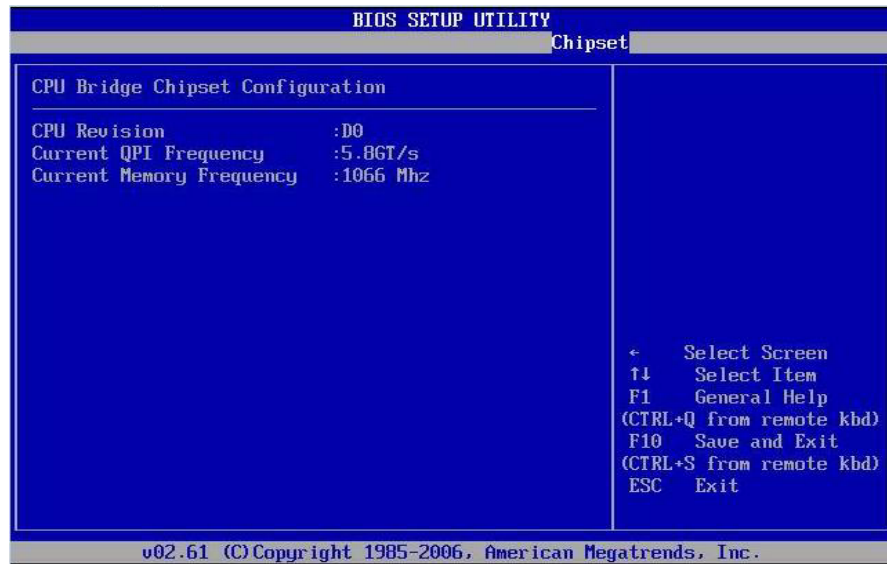
B.6.0.3 BIOS Chipset Menu NorthBridge Configuration

```
                        BIOS SETUP UTILITY
                                        Chipset

NorthBridge Chipset Configuration                 Crystal Beach / DMA
                                                   configuration.
NB Revision               :B3
Current QPI Frequency     :5.8GT/s

Crystal Beach / DMA       [Enabled]
Crystal Beach / DCA       [Enabled]




                                          ←     Select Screen
                                          ↑↓    Select Item
                                          +-    Change Option
                                          F1    General Help
                                          (CTRL+Q from remote kbd)
                                          F10   Save and Exit
                                          (CTRL+S from remote kbd)
                                          ESC   Exit

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```

B.6.0.4 BIOS Chipset Menu SouthBridge Configuration

```
                        BIOS SETUP UTILITY
                                        Chipset

South Bridge Chipset Configuration              Options

Restore on AC Power Loss      [Power Off]        Power Off
                                                 Power On
                                                 Last State




                                          ←     Select Screen
                                          ↑↓    Select Item
                                          +-    Change Option
                                          F1    General Help
                                          (CTRL+Q from remote kbd)
                                          F10   Save and Exit
                                          (CTRL+S from remote kbd)
                                          ESC   Exit

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```

B.7   BIOS Exit Menu


```
                    BIOS SETUP UTILITY
  Main    Advanced   PCI    Boot    Security    Chipset    Exit

  Exit Options                              Exit system setup
 ─────────────────────────────────────     after saving the
  Save Changes and Exit                     changes.
  Discard Changes and Exit
  Discard Changes                           F10 key can be used
                                            for this operation.
  Load Optimal Defaults




                                            ←    Select Screen
                                            ↑↓    Select Item
                                            Enter Go to Sub Screen
                                            F1    General Help
                                            (CTRL+Q from remote kbd)
                                            F10   Save and Exit
                                            (CTRL+S from remote kbd)
                                            ESC   Exit

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```

Connector Pinouts

This appendix contains information about the following connector pinouts:

C.1   3–Cable Dongle Pinouts

The following figure and table provides pinout information for the 3-cable dongle
connectors.

FIGURE C-1   3-Cable Dongle Connectors (P/N 530-3936 Option # 4622A)
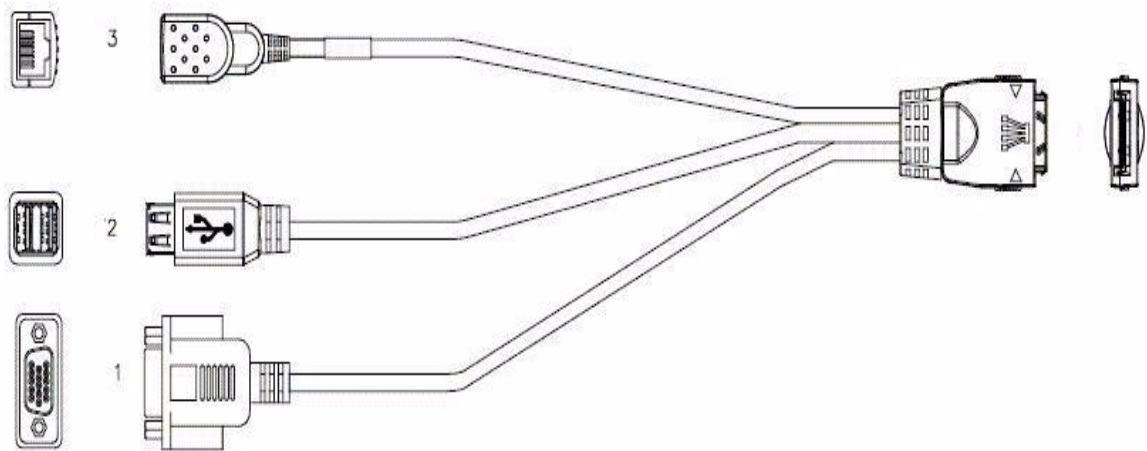
Figure Legend Pinouts for 3-Cable Dongle Connectors (Option# 4622A)

3 RJ-45	RJ-45 Serial Signal	2 USB	USB Signal	1 VGA	VGA Signal
1	RTS	1	USB1 VCC	1	Red
2	DTR	2	USB1 DN	2	Green
3	Trasnmit Data	3	USB1 DP	3	Blue
4	Ground	4	USB1 Ground	4	Not used
5	Ground	5	USB2 Ground	5	Ground
6	Recive Data	6	USB2 DP	6	Ground
7	DSR and DCD	7	USB2 DP	7	Ground
8	CTS	8	USB2 Ground	8	Ground
				9	5V
				10	Ground
				11	Ground
				12	VGA Data
				13	H_Sync
				14	V_Sync

C.2 4–Cable Dongle Pinouts

The following figure and table provides pinout information for the 4-cable dongle connectors.

FIGURE C-2 4-Cable Dongle Connectors (P/N 530-3934 Option # 4621A)
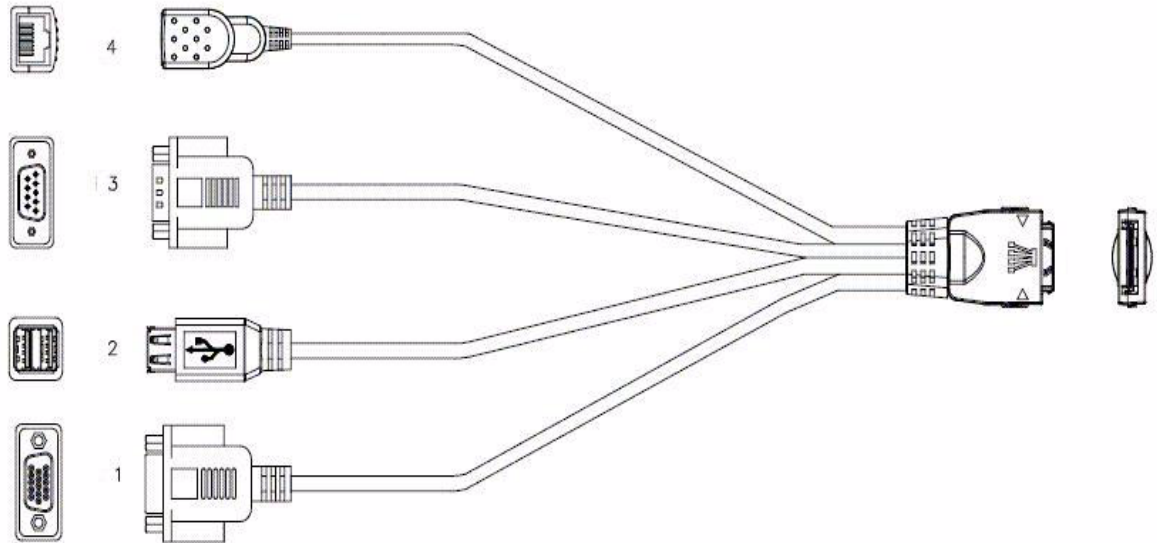
Figure Legend Pinouts for 4-Cable Dongle Connectors (Option# 4622A)

4 RJ-45	RJ-45 Signal	3 Serial	Serial Signal	2 USB	USB Signal	1' VGA	VGA Signal
Note - The RJ-45 serial connector on the 4-Cable Dongle (Option# 4621A) is not functional on the Sun Blade Sun Blade X6270 Server Module.		1	DCD	1	USB1 VCC	1	Red
		2	Receive Data	2	USB1 DN	2	Green
		3	Trasnmit Data	3	USB1 DP	3	Blue
		4	DTR	4	USB1 Ground	4	Not used
		5	Ground	5	USB2 VCC	5	Ground
		6	DSR	6	USB2 DN	6	Ground
		7	RTS	7	USB2 DP	7	Ground
		8	CTS	8	USB2 Ground	8	Ground
		9	RI			9	5V
						10	Ground
						11	Ground
						12	Data
						13	H_Sync
						14	V_Sync
						15	Clock

C.3   SAS/SATA Connectors

The Serial Attached SCSI (SAS)/Serial Advanced Technology Attachment (SATA)
connector pins and their corresponding descriptions are shown in the figure and
table in this section.

FIGURE C-3   SAS/SATA Connector
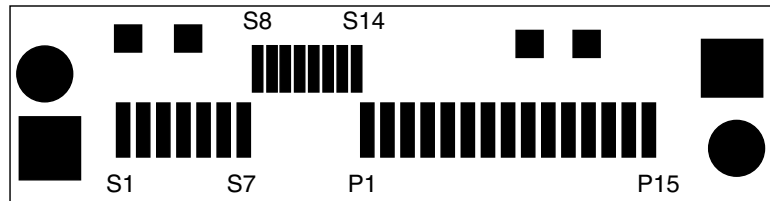
TABLE C-1   SAS/SATA Connector Pins

Segment	Pin Number	Pin Name	Description
Signal Segment	S1	Gnd	Second mate ground
	S2	TX+	Positive side of transmit to hard drive
	S3	TX-	Negative side of transmit to hard drive
	S4	Gnd	Second mate ground
	S5	RX-	Negative side of receive from hard drive
	S6	RX+	Positive side of receive from hard drive
	S7	Gnd	Second mate ground
Backside Signal Segment	S8	Gnd	Second mate ground
	S9		Not used
	S10		Not used
	S11	Gnd	Second mate ground
	S12		Not used
	S13		Not used
	S14	Gnd	Second mate ground

TABLE C-1   SAS/SATA Connector Pins *(Continued)*

Segment	Pin Number	Pin Name	Description
Power Segment	P1	3.3 V	Not used
	P2	3.3 V	Not used
	P3	3.3 V	Not used
	P4	Gnd	First mate ground
	P5	Gnd	Second mate ground
	P6	Gnd	Second mate ground
	P7	5.0 V	Pre-charge, second mate
	P8	5.0 V	
	P9	5.0 V	
	P10	Gnd	Second mate ground
	P11	Reserved	Should be grounded
	P12	Gnd	First mate ground
	P13	12.0 V	Pre-charge, second mate
	P14	12.0 V	
	P15	12.0 V	

C.4 SAS Diskplane

The SAS diskplane connector pins and their corresponding descriptions are shown in the following table.

TABLE C-2   SAS Disk Backplane Signal Connector Pins

Pin Number	Signal Name
1, 4, 7	GND
2, 3	TX+/TX-
5, 6	RX+/RX-

C.5   SAS Power/LED Connector

The SAS power/LED connector pins and their corresponding descriptions are shown in the figure and table in this section.

FIGURE C-4   SAS Power/LED Connector
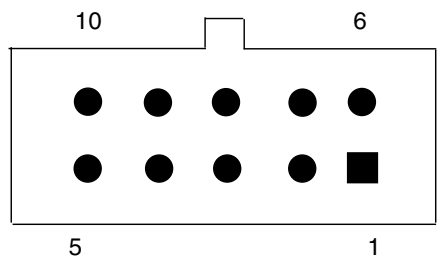
TABLE C-3   SAS Power/LED Connector Pins

Pin Number	Signal Name
1	DISK1_FAULT_LED_L
2	DISK1_RDY2RM_L
3	DISK1_PRSNT_L
4	12V
5	GND
6	DISK0_FAULT_LED_L
7	DISK0_RDY2RM_L
8	DISK0_PRSNT_L
9	GND
10	5V

C.6 Compact Flash

The Compact Flash connector pins and their corresponding descriptions are shown in the figure and table in this section.

FIGURE C-5   Compact Flash Connector
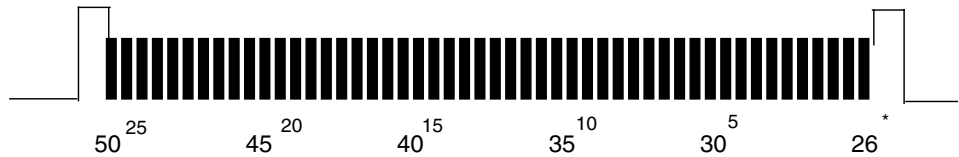
TABLE C-4   Compact Flash Connector Pins

Signal Name	Pin #	Pin #	Signal Name
GND	1	26	PRSNT_N
D03	2	27	D11
D04	3	28	D12
D05	4	29	D13
D06	5	30	D14
D07	6	31	D15
CS1_L	7	32	CS3_L
GND	8	33	No Connect
ATA_SEL	9	34	IOR_L
GND	10	35	IOW_L
GND	11	36	WE
GND	12	37	INT_L
3.3V	13	38	3.3V
GND	14	39	IDE_CSEL
GND	15	40	No Connect
GND	16	41	IDE_RESET_L
GND	17	42	IDE_RDY

TABLE C-4   Compact Flash Connector Pins *(Continued)*

Signal Name	Pin #	Pin #	Signal Name
ADDR2	18	43	DRQ_L
ADDR1	19	44	DACK_L
ADDR0	20	45	No Connect
D00	21	46	No Connect
D01	22	47	D08
D02	23	48	D09
No Connect	24	47	D10
IDE_CD2	15	50	GND

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