

Sun Blade X6270 M2 Server Module

Service Manual



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Using This Documentation

This Service Manual contains information and procedures for maintaining and upgrading Oracle's Sun Blade X6270 M2 Server Module.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Blade X6270 M2 Server Module Safety and Compliance Guide* (821-0500) and in the *Important Information for Sun Hardware Systems* (821-1590).

Product Information

For information about the Sun Blade X6270 M2 Server Module, go to the following web site: <http://www.oracle.com/goto/x6270m2>.

At that site, you can find links and navigate to the following information and downloads:

- Product information and specifications
- Supported operating systems
- Software and firmware downloads
- Supported option cards
- Supported Network Express Modules
- External storage options
- Systems Handbook

To download the Tools and Drivers DVD image, go the following web site and navigate to the Tools and Drivers download page:

<http://www.oracle.com/goto/x6270m2>.

Related Documentation

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

<http://docs.sun.com/app/docs/prod/blade.x6270m2#hic>

Title	Content	Part Number	Format
<i>Sun Blade X6270 M2 Server Module Product Notes</i>	Late-breaking information about the server module	821-0496	PDF HTML
<i>Sun Blade X6270 M2 Server Module Getting Started Guide</i>	Basic installation information for setting up the server module	821-0494	PDF Print
<i>Sun Blade X6270 M2 Server Module Installation Guide</i>	Detailed installation information for setting up the server module	821-0495	PDF HTML Print option
<i>Sun Blade X6270 M2 Server Module Installation Guide for Linux, Virtual Machine Software, and Oracle Solaris Operating Systems</i>	Installation instructions for the Linux, Oracle VM, VMware, and Oracle Solaris operating systems	821-0497	PDF HTML
<i>Sun Blade X6270 M2 Server Module Installation Guide for Windows Operating Systems</i>	Installation instructions for the Windows Server operating systems	821-0498	PDF HTML
<i>Sun Installation Assistant 2.3 Through 2.4 User's Guide for x64 Systems</i>	Instructions for using the Sun Installation Assistant (SIA) when installing a Windows or Linux operating system	821-0694	PDF HTML
<i>Sun Blade X6270 M2 Server Module Service Manual</i>	Information and procedures for maintaining and upgrading the server module	821-0499	PDF HTML
<i>Sun Server CLI Tools and IPMItool 2.0 User's Guide</i>	Information about how to install, configure, and work with CLI tools and IPMItool	821-1600	PDF HTML

Title	Content	Part Number	Format
<i>Oracle x86 Servers Diagnostics Guide</i>	Information about how to use the diagnostic software tools provided with x64 servers	820-6750	PDF HTML
<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection (formerly called Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection)</i>	Documents covering 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
<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Blade X6270 M2 Server Module</i>	ILOM information that is specific to the Sun Blade X6270 M2 Server Module	821-0501	PDF HTML
<i>Safety and Compliance Manual</i>	Hardware safety and compliance information for the server module	821-0500	Print
<i>Important Safety Information for Sun Hardware Systems</i>	Multilingual hardware safety and compliance information for all Sun hardware systems	821-1590	Print

Translated versions of some of these documents are available at the web site listed above this table. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

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

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Sun Blade X6270 M2 Hardware and Software Features

This chapter summarizes the features available on the Sun Blade X6270 M2 Server Module and contains the following topics:

- Section 1.1, “Server Hardware and Software Features” on page 1-2
- Section 1.2, “Server Module Front Panel Indicators, Buttons, and Port” on page 1-4
- Section 1.3, “Attaching Devices to the Server” on page 1-5
- Section 1.4, “Replaceable Server Components” on page 1-7

1.1 Server Hardware and Software Features

TABLE 1-1 summarizes the standard configurations and optional components available for the Sun Blade X6270 M2 Server Module.

TABLE 1-1 Server Hardware and Software Features

X6270 M2 Server Module	Description
Standard Server Components	<p>The following standard components are shipped on the Sun Blade X6270 M2 Server Module:</p> <ul style="list-style-type: none">• Service Processor (SP) – One SP per server. SP provides remote keyboard, mouse, and video 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 M2 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 M2 Server Module front panel provides a universal connection port for attaching devices directly to the server using a dongle cable.
Preinstalled CPU and Memory Configurations	<p>Servers are typically ordered and shipped with preinstalled memory and CPU configurations. The preinstalled memory and CPU assemblies offered (and shipped) for the Sun Blade X6270 M2 Server Module include:</p> <ul style="list-style-type: none">• 1 Intel Xeon Six-Core X5680, 3.33GHz, 12MB Cache, 6.40 GT/s QPI, HT, Turbo Boost, 130W with Heatsink• 1 Intel Xeon Six-Core X5670, 2.93GHz, 12MB Cache, 6.40 GT/s QPI, HT, Turbo Boost, 95W with Heatsink• 1 Intel Xeon Four-Core E5620, 2.40GHz, 12MB Cache, 5.86 GT/s QPI, HT, Turbo Boost, 80W with Heatsink

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

Optional Components	<p>The following optional server module components can be ordered and shipped separately:</p> <ul style="list-style-type: none">• CPU assembly options• DDR3 memory kits• SATA and SAS storage drives• Dongle cable option• Fabric Expansion Module (FEM) options• RAID Expansion Module (REM) options• Operating system software• Printed documentation – <i>Sun Blade X6270 M2 Server Module Installation Guide</i> (821-0495)
Supported Operating Systems	<p>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://oracle.com/goto/blades</p> <p>The following operating systems are supported on the Sun Blade X6270 M2 Server Module.</p> <ul style="list-style-type: none">• Oracle Enterprise Linux 5.4 (64-bit)• Oracle VM 2.2.1• Solaris 10 10/09 and later• Microsoft Windows Server 2008 SP2 Datacenter (64-bit) with Hyper-V• Microsoft Windows Server 2008 SP2 Enterprise (64-bit) with Hyper-V• Microsoft Windows Server 2008 SP2 Standard (64-bit) with Hyper-V• Microsoft Windows Server 2008 R2 Datacenter (64-bit) with Hyper-V• Microsoft Windows Server 2008 R2 Enterprise (64-bit) with Hyper-V• Microsoft Windows Server 2008 R2 Standard (64-bit) with Hyper-V• Red Hat Enterprise Linux (RHEL) 5.4 (64-bit)• SUSE Linux Enterprise Server (SLES) 10 SP3 (64-bit)• SUSE Linux Enterprise Server (SLES) 11 (64-bit)• VMware ESX and ESXi 4.0 Update 1

1.2 Server Module Front Panel Indicators, Buttons, and Port

FIGURE 1-1 identifies the front panel buttons, indicators, and ports on the server.

FIGURE 1-1 Sun Blade X6270 M2 Server Module Front Panel

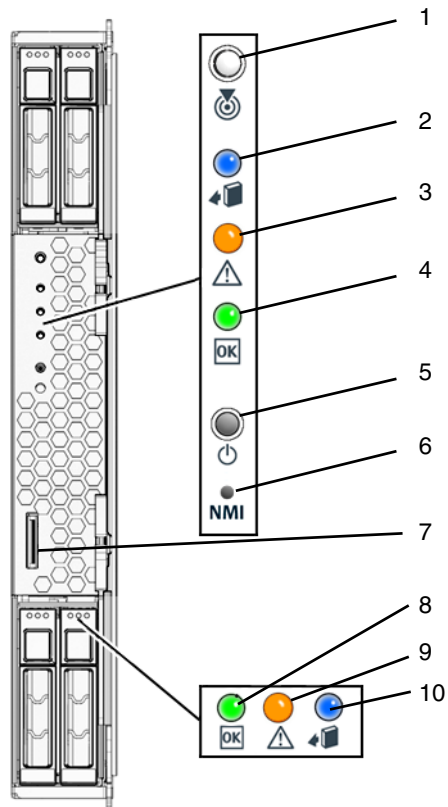


Figure Legend Sun Blade X6270 M2 Server Module Front Panel LEDs, Buttons, and Port

-
- 1 Server Module Locate LED and button – White
 - 2 Server Module Ready to Remove LED – Blue
 - 3 Server Module Service Action Required LED – Amber
 - 4 Server Module OK/Power LED – Green (blinking or solid state)
 - 5 Server Module Power button/reset
-

Figure Legend Sun Blade X6270 M2 Server Module Front Panel LEDs, Buttons, and Port (Continued)

-
- | | |
|----|---|
| 6 | Non-Maskable Interrupt (NMI) button (Service only) |
| 7 | Universal Connector Port (UCP), used for dongle cable |
| 8 | HDD OK/Power LED – Green |
| 9 | HDD Service Action Required LED – Amber |
| 10 | HDD Ready to Remove LED – Blue |
-



Caution – Do not use the NMI button unless you are instructed to do so by authorized Service personnel. The NMI button sends an NMI dump request to the CPUs, which is used by Field Service for debugging activities at the request of 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 M2 Server Module:

- 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. See [Appendix C](#) for additional connector pinout information.

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

You can use the VGA or USB connectors on the dongle cable to communicate with the server module BIOS and operating system. Or, you can use the serial connector to communicate with the server module SP.



Caution – You should use the dongle cable only for configuration and service purposes. Disconnect the dongle cable from the server module after the configuration or service operation is complete to avoid damaging the cable.

[FIGURE 1-2](#) illustrates how to attach the 3-Cable Dongle to the Sun Blade X6270 M2 Server Module universal connector port (UCP).

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

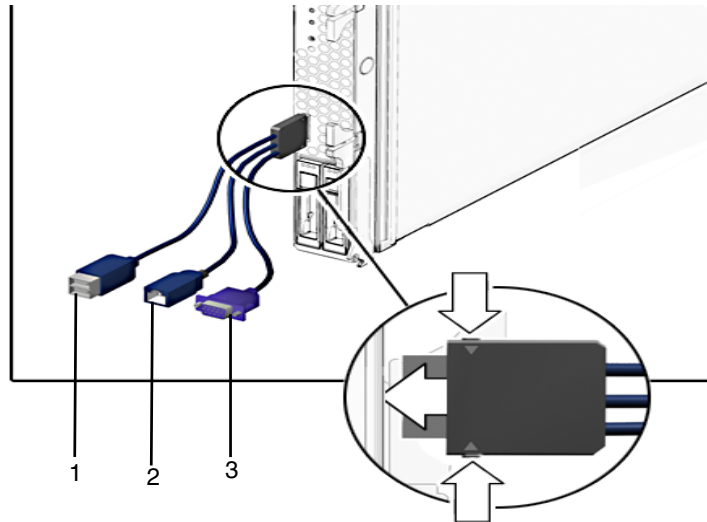


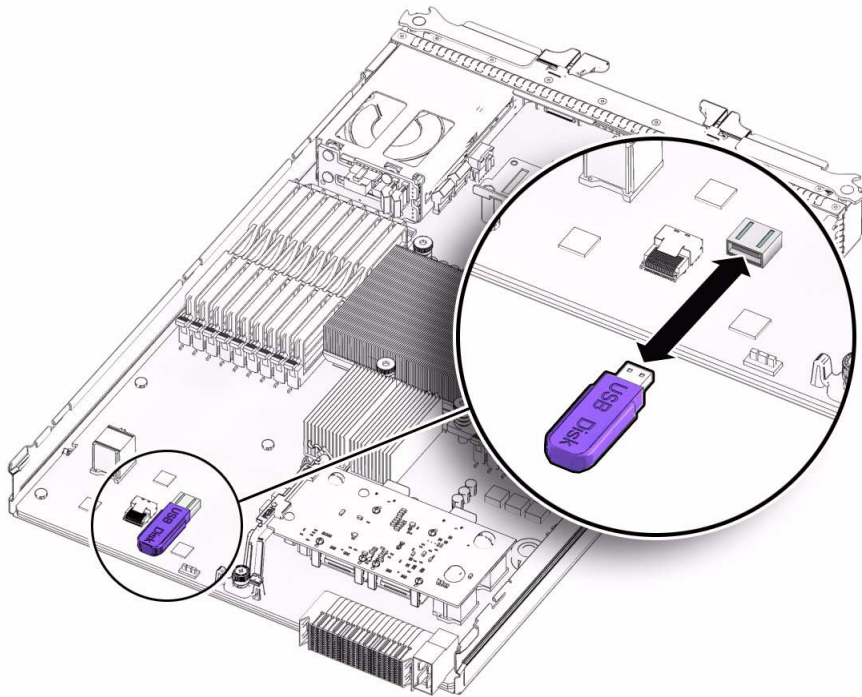
Figure Legend 3-Cable Dongle Connectors

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

1.3.1 Attaching a USB Drive

You can use a USB drive to communicate with the server module BIOS and operating system. [FIGURE 1-3](#) illustrates how to attach the USB drive on the Sun Blade X6270 M2 Server Module motherboard.

FIGURE 1-3 Attaching a USB Drive



1.4 Replaceable Server Components

FIGURE 1-4 identifies the replaceable component locations on the Sun Blade X6270 M2 Server Module, with the top cover removed.

FIGURE 1-4 Sun Blade X6270 M2 Server Module Replaceable Component Locations

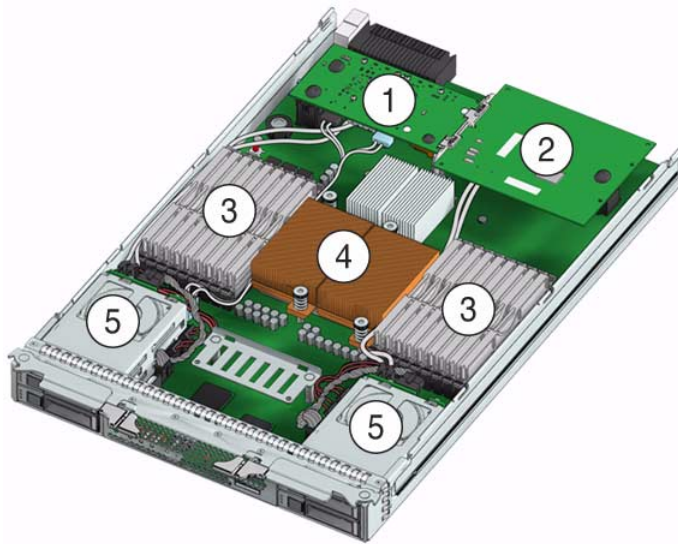


Figure Legend Replaceable Server Components

-
- 1 Fabric Expansion Module (FEM) (optional component) See [“Installing or Servicing a Fabric Expansion Module \(FEM\)”](#) on page 21.
 - 2 Raid Expansion Module (REM) (optional component)
See [“Installing or Replacing a RAID Expansion Module \(REM\) and Battery”](#) on page 22.
 - 3 DIMMs (optional components)
The DIMMs in [FIGURE 1-4](#) are shown populated with filler panels. See [“Installing or Replacing Memory Modules \(DIMMs\)”](#) on page 19.
Note - Processor chip contains memory controller. Do not attempt to populate DIMMs sockets next to unpopulated (empty) CPU sockets.
 - 4 CPUs and heatsinks (up to two CPUs may be installed)
See [“Installing or Replacing a CPU and Heatsink”](#) on page 26.
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 1-4](#)). Additional CPUs may be ordered.
Note - In the example shown in [FIGURE 1-4](#), the CPUs are installed under the two heatsinks.
 - 5 Storage devices (hard disk drives or solid state drives)
Up to four optional storage devices may be installed.
See [“Installing or Servicing a Hard Disk Drive or Solid State Drive”](#) on page 10.
-

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.

- Section 2.1, “Powering On and Off the Server Module” on page 2-2
 - “Power On the Server Module” on page 2-2
 - “Troubleshoot Server Power States” on page 2-4
 - “Power Off and Verify Server Is Ready for Removal From Chassis” on page 2-3
- Section 2.2, “About the BIOS” on page 2-5
 - “BIOS Booting and Set Up Considerations” on page 2-5
 - “BIOS Setup Utility Menus” on page 2-12
 - “Enabling Support for Common BIOS Settings” on page 2-15
 - “Updating the BIOS Firmware” on page 2-21

2.1 Powering On and Off the Server Module

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

- [“Power On the Server Module” on page 2-2](#)
- [“Power Off and Verify Server Is Ready for Removal From Chassis” on page 2-3](#)
- [“Troubleshoot Server Power States” on page 2-4](#)

2.1.1 Power On the Server Module

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

1. Verify that the server module 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 2-4](#).

2. Apply main power to the server SP and host.

For example:

- **Local server power-on.** Press and release the recessed Power button on the server module front panel.

For Power button location, see [FIGURE 1-1](#).

- **ILOM SP web interface power-on.** Log in to the ILOM web interface for the server SP and select: Remote Control --> Remote Power Control tab, then select Reset from the Select Action list box.

- **ILOM SP CLI power-on.** Log in to the SP ILOM command-line interface (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 [Section 2.1.3, “Troubleshoot Server Power States” on page 2-4](#).

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.** 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:
 - Select Remote Control --> Remote Power Control.
 - 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection* 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 OK/Power LED on the front panel of the server is in standby or off state.
- b. Ensure that the system was prepared for removal using 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*.

For information about removing the server from the chassis and removing the cover from the server, see [“Removing the Server From the Chassis”](#) on page 3-4.

2.1.3 Troubleshoot Server Power States

Each time a server module powers on in the Sun Blade 6000 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 whether the server has permission to power on. An event message is recorded in the log any time there is an inadequate 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*.

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 *Oracle Integrated Lights Out Manager (ILOM 3.0) Supplement for Sun Blade X6270 M2 Server Module (821-0501)* and the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*.

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:

- [“BIOS Booting and Set Up Considerations” on page 2-5](#)
- [“BIOS Setup Utility Menus” on page 2-12](#)
- [“Enabling Support for Common BIOS Settings” on page 2-15](#)
- [“Updating the BIOS Firmware” on page 2-21](#)

2.2.1 BIOS Booting and Set Up Considerations

Refer to the following sections for information when booting the BIOS:

- [“Default BIOS Power-On Self-Test \(POST\) Events” on page 2-6](#)
- [“BIOS POST F1 and F2 Errors” on page 2-7](#)
- [“How BIOS POST Memory Testing Works” on page 2-10](#)
- [“PCI Express ExpressModule Slot Booting Priority” on page 2-11](#)
- [“Ethernet Port Device and Driver Naming” on page 2-11](#)
- [“Ethernet Port Booting Priority” on page 2-12](#)

2.2.1.1 Hardware Prefetchers

Hardware prefetchers work well in workloads that traverse array and other regular data structures. The hardware prefetcher option is disabled by default and should be disabled when running applications that perform aggressive software prefetching or

for workloads with limited cache. For example, memory-intensive applications with high bus utilization could see a performance degradation if hardware prefetching is enabled.

2.2.1.2 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

TABLE 2-1 BIOS POST Events (Continued)

Event	Cause	Boot continues on host?
Embedded controller management	Management controller initialization	Does not apply
Secondary processor(s) initialization	Secondary CPU initialization asserted System firmware progress	Does not apply
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	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

2.2.1.3 BIOS POST F1 and F2 Errors

Each power-on self-test (POST) diagnostic is a low-level test designed to isolate 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. <p>Note - Where QPI [x] equals 0 for QPI Link 0 or 1 for QPI Link 1.</p>
Uncorrectable Error Detected on Last Boot:IOH(0) PCI-E [x] Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. <p>Note - Where PCI-E [x] port number can range from 1 to 10 depending on the PCI root port on IOH.</p>
Uncorrectable Error Detected on Last Boot:IOH(0) ESI Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Miscellaneous Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details.
BMC Not Responding	ILOM error	<ul style="list-style-type: none"> • Press F1 to continue. <p>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.</p>

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

BIOS POST Error Message	Error Type	Resolution
<ul style="list-style-type: none"> • Primary Master Hard Disk Error • Primary Slave Hard Disk Error • Secondary Master Hard Disk Error • Secondary Slave Hard Disk Error 	IDE/ATAPI error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>Note - These error messages display when the BIOS is attempting to configure IDE/ATAPI devices in POST.</p>
Timer Error	8254 timer error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>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.</p>
RAM R/W test failed	Memory test failure	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>Note - This type of error typically indicates that the RAM read/write test failed.</p>
KBC BAT Test failed	Keyboard controller basic assurance test error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>Note - Keyboard controller BAT test failed. This error might indicate a problem with keyboard controller initialization.</p>
Display memory test failed	Video display error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details.
CMOS Battery Low	CMOS battery error	<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • CMOS Checksum Bad • CMOS Date/Time Not Set 	CMOS error	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>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 Administrator and User password verification.</p>
Keyboard/Interface Error	Keyboard controller error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>Note - This type of error indicates that the Keyboard Controller failure. This error might indicate a problem with system hardware.</p>
S.M.A.R.T error on the drive	S.M.A.R.T device error	<ul style="list-style-type: none"> • Press F1 to continue. • Check the SP event log in ILOM for more details. <p>Note - S.M.A.R.T. failure messages might indicate the need to replace the storage device.</p>

2.2.1.4 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 exiting 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.

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.

2.2.1.5 PCI Express ExpressModule Slot Booting Priority

The Sun Blade X6270 M2 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.

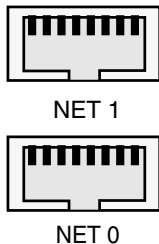
See the chassis documentation for further information on PCIe EMs.

2.2.1.6 Ethernet Port Device and Driver Naming

The Sun Blade X6270 M2 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



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.

See [TABLE 2-3](#) for the logical (operating system) and physical (BIOS) naming conventions used for each interface.

TABLE 2-3 Logical Port Naming

Interface	NET0	NET1
BIOS	slot 1F00	slot 1F01
Solaris 10 10/09	igb0	igb1
RHEL 5.4 (64-bit)	eth0*	eth1
Oracle Enterprise Linux (OEL) 5.4 (64-bit)	eth0†	eth1
SLES 10 SP3 (64-bit) and SLES 11 (64-bit)	eth0‡	eth1
Windows 2008	net1	net2
Oracle VM 2.2.1	xenbr0	xenbr1
VMware ESX 4.0 and ESXi 4.0	vmnic#**	vmnic#

* If you are using the XEN kernel in RHEL 5, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named *xenbrn*, where *n* is 0-3.

† If you are using the XEN kernel in OEL 5, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named *xenbrn*, where *n* is 0-3.

‡ If you are using the XEN kernel in SLES 10 or SLES 11, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named *xenbrn*, where *n* is 0-3.

** For VMware, the Ethernet port that the user assigns to the service console will be *vmnic0*. Other ports are mapped by ascending order of the PCI bus enumerations.

2.2.1.7 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

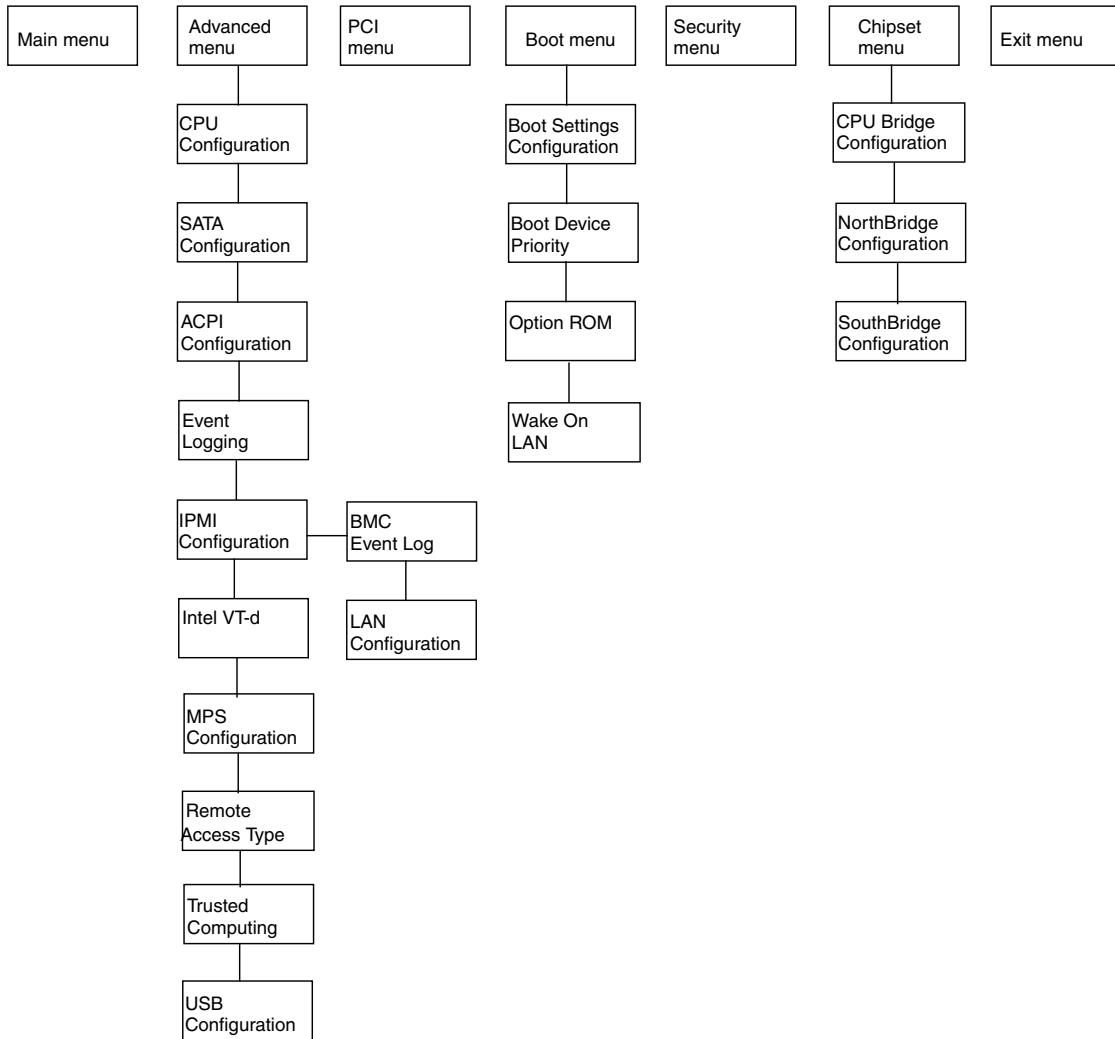
[TABLE 2-4](#) provides descriptions for the seven top-level BIOS setup menus.

TABLE 2-4 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 Administrator 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 2-2](#) identifies the sub-menus that you can access from each of the seven top-level BIOS menus.

FIGURE 2-2 Sun Blade X6270 M2 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:

- “Accessing the BIOS Setup Utility Menus” on page 2-15
- “Configuring Support for TPM” on page 2-16
- “Configuring SP LAN Settings” on page 2-18
- “Configuring Option ROM Settings in BIOS” on page 2-20

2.2.3.1 Accessing the BIOS Setup Utility Menus

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

▼ Access BIOS Setup Utility Menus

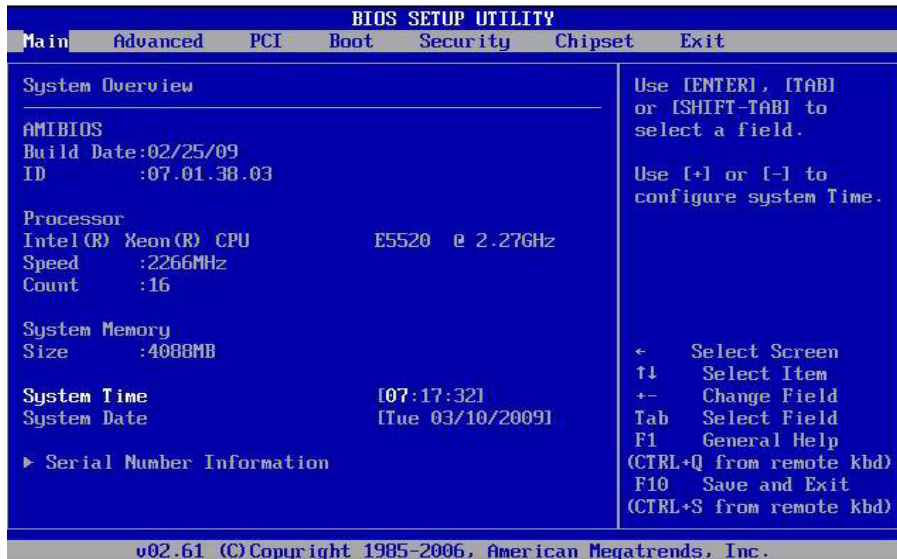
1. **Power-on or power-cycle the server.**
2. **To enter the BIOS Setup Utility, press the F2 key while the system is performing the power-on self-test (POST).**

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 Main menu appears.



2.2.3.2 Configuring Support for TPM

If you intend to use the Trusted Platform Module (TPM) feature set that is provided in Windows 2008, OEL 5, and SLES 11, you must configure the Sun Blade X6270 M2 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.

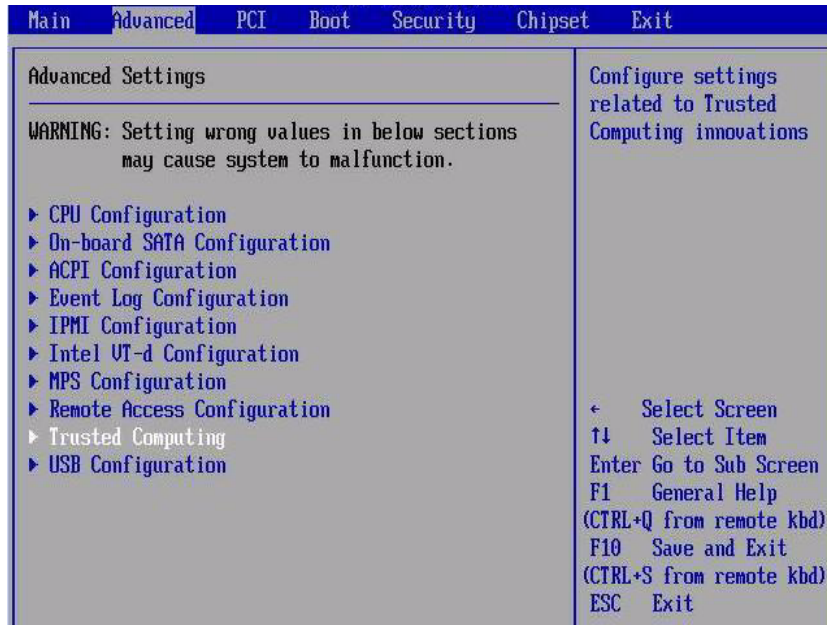
▼ Configure TPM Support

1. Access the BIOS Setup Utility menus.

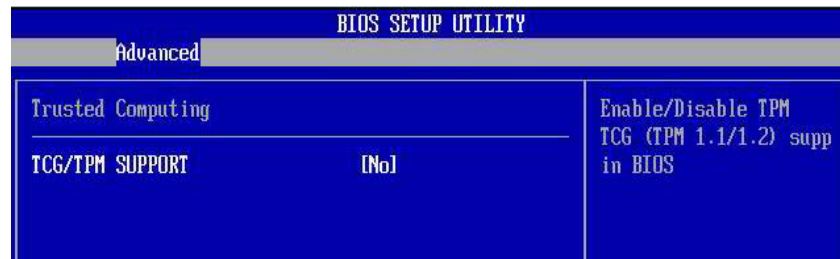
For instructions, see “Access BIOS Setup Utility Menus” on page 2-15.

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

The Advanced Settings screen appears.



3. In the Advanced Settings screen, select **Trusted Computing**, then press **Enter**.
The Trusted Computing screen appears.



4. In the Trusted Computing screen, select **TCG/TPM Support**.
A tab appears listing the available TCG/TPM options.
5. Set the **TCG/TPM Support** option to **Yes**, then 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, indicating that the TCG/TPM Support setting has changed to Yes.

- 6. In the Trusted Computing screen, select the Execute TPM Command, then press Enter.**

A tab appears listing the available Execute TPM Command options.

- 7. Set the Execute TPM Command option to Enabled, then click OK.**

The updated Trusted Computing screen appears, 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 Main menu appears.

- b. In the BIOS Setup Utility, select Advanced --> Trusted Computing, then press Enter.**

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

- 10. Press F10 to exit BIOS.**

2.2.3.3 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*.

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 2-2](#) for menu navigation tree.

▼ Configure LAN Settings for SP

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

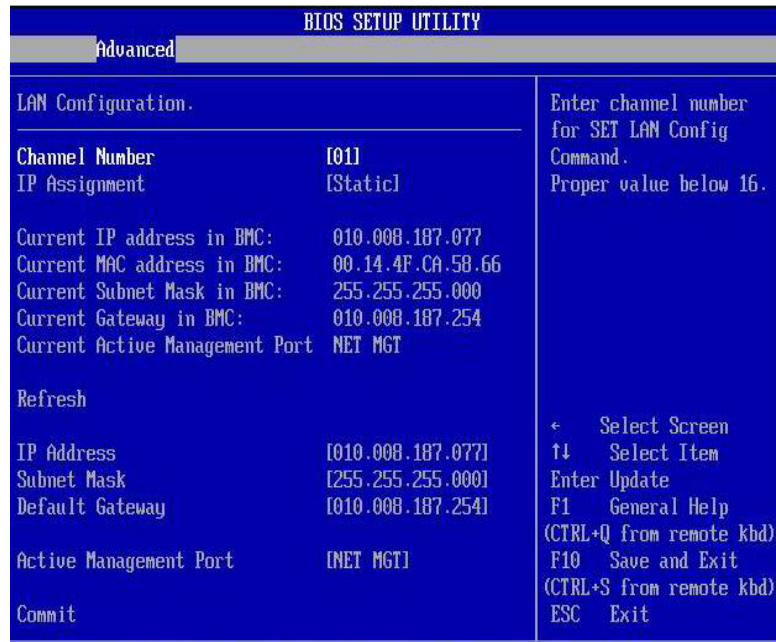
For instructions, see [“Access BIOS Setup Utility Menus”](#) on page 2-15.

- 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 2.0 Configuration.**

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

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



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

▼ View or Set the ILOM SP IP Address Using the BIOS Setup Utility

1. Power on the server (or restart the server if it is running).
2. When the BIOS splash screen or text prompt appears during the power-on self-test (POST) operation, press F2 to access the BIOS Setup Utility.
3. Using the left and right arrow keys on the keyboard, navigate to the Advanced tab.

The Advanced Settings screen appears.

4. Using the up and down arrow keys, select the IPMI Configuration option and press Enter to go to the subscreen.

The IPMI Configuration subscreen appears.

5. **Using the up and down arrow keys, select the Set LAN Configuration option and press Enter.**
The LAN Configuration subscreen appears and shows the current ILOM SP IP address.
6. **To set the IP address:**
 - a. **Select Set LAN Configuration, then use the arrow keys to select settings.**
 - b. **Specify the appropriate settings, then proceed to Step 7.**
7. **Select Commit and press Enter.**
8. **Allow about five seconds for the Commit to complete, then select Refresh and press Enter.**
9. **Select Refresh a second time and press Enter to confirm that the IP address information has been set.**
10. **Press F10 to save any changes you made and to exit the BIOS Setup Utility.**

2.2.3.4 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, then press Enter.**

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

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 the changes and exit BIOS.

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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*.

Maintaining the Sun Blade X6270 M2 Server Module

This chapter contains information and procedures for servicing the Sun Blade X6270 M2 Server Module hardware.

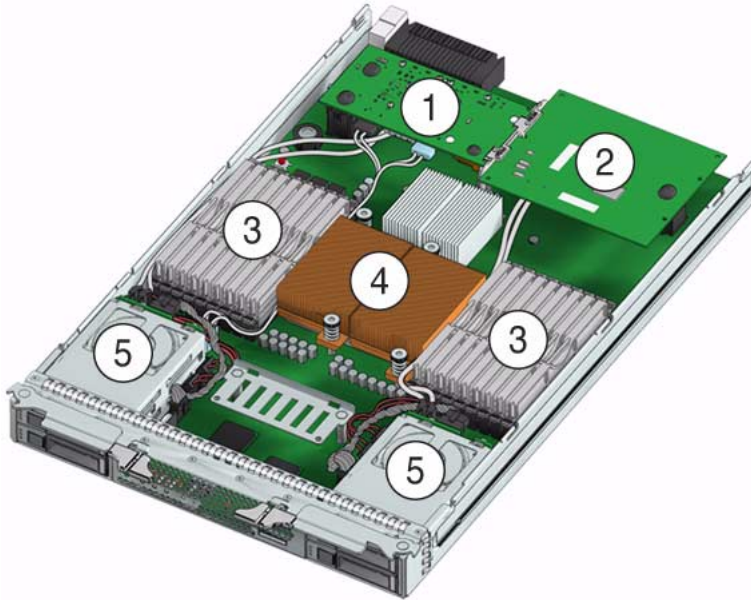
This chapter contains the following topics:

- Section 3.1, “Locations of Replaceable Components” on page 3-2
- Section 3.2, “Tools and Supplies Needed” on page 3-3
- Section 3.3, “Avoid Electrostatic Discharge” on page 3-3
- Section 3.4, “Removing the Server From the Chassis” on page 3-4
- Section 3.5, “Removing or Replacing Filler Panels” on page 3-6
- Section 3.6, “Removing or Installing Server Module Cover” on page 3-9
- Section 3.7, “Procedures for Replaceable Components” on page 3-10
 - Section 3.7.1, “Installing or Servicing a Hard Disk Drive or Solid State Drive” on page 3-10
 - Section 3.7.2, “Replacing the System Battery” on page 3-17
 - Section 3.7.3, “Installing or Replacing Memory Modules (DIMMs)” on page 3-19
 - Section 3.7.4, “Installing or Servicing a Fabric Expansion Module (FEM)” on page 3-21
 - Section 3.7.5, “Installing or Replacing a RAID Expansion Module (REM) and Battery” on page 3-22
 - Section 3.7.6, “Installing or Replacing a CPU and Heatsink” on page 3-26
 - Section 3.7.7, “Cabling the REM and Disk Drives” on page 3-32

3.1 Locations of Replaceable Components

FIGURE 3-1 shows the locations of the replaceable Sun Blade X6270 M2 Server Module components that are documented in this chapter.

FIGURE 3-1 Sun Blade X6270 M2 Server Module Replaceable Component Locations



3.2 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)

3.3 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
 - Electronic Discharge (ESD) mat, 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.

3.4 Removing the Server From the Chassis

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.

▼ Remove Server Module From Chassis

To replace components for the Sun Blade X6270 M2 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 [“Installing or Servicing a Hard Disk Drive or Solid State Drive”](#) on page 3-10.



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.

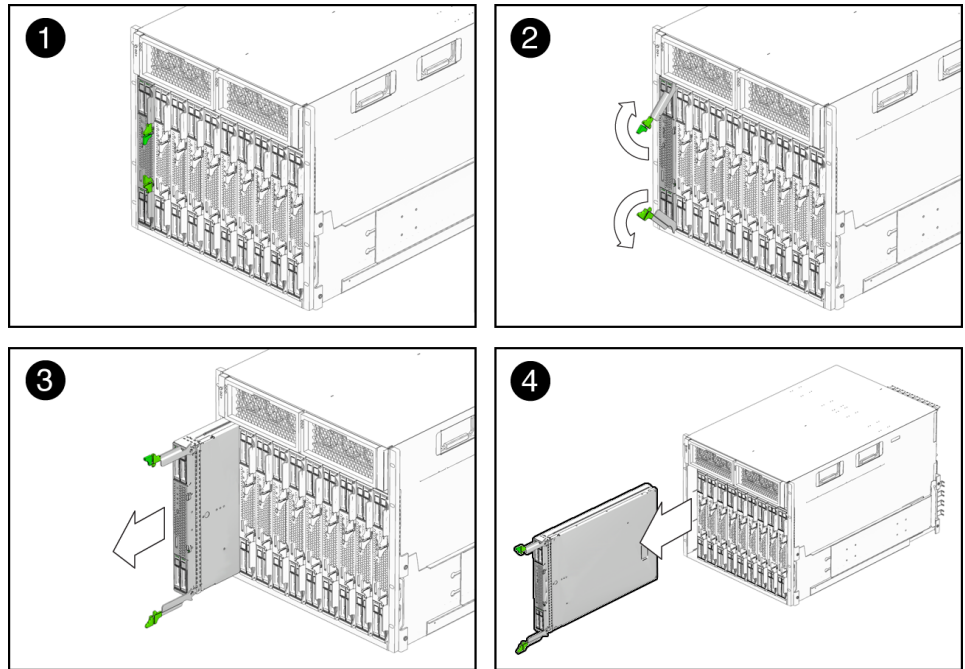
For instructions, see [“Power Off and Verify Server Is Ready for Removal From Chassis”](#) on page 2-3.

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

See [FIGURE 3-2](#).

- 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 3-2 Removing the Server From the Chassis



3. Place the server on a flat antistatic surface.

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.

3.5 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 module 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, and CPUs) to ensure proper air flow 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.

▼ Remove or Insert Filler Panels

To remove or insert server module filler panels follow the procedures in [TABLE 3-1](#).

TABLE 3-1 Filler Panel Replacement Procedures

Filler Panel Module	Remove Procedure	Install Procedure
Server Module	<ol style="list-style-type: none">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.	<ol style="list-style-type: none">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 close.4. Close the release lever until it locks the filler panel in place.

TABLE 3-1 Filler Panel Replacement Procedures (Continued)

Filler Panel Module	Remove Procedure	Install Procedure
Memory Module	<ol style="list-style-type: none">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.	<ol style="list-style-type: none">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 the empty slot, then gently press the filler panel into slot until both ejector levers close, locking the filler panel in place.
Storage Drive Module (hard disk drive or solid state drive)	<ol style="list-style-type: none">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.	<ol style="list-style-type: none">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 start to close 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)	<ol style="list-style-type: none">1. Use an Allen wrench (4mm) to loosen the two mounting screws.2. Gently pull up the air baffle to expose the empty CPU socket.	<ol style="list-style-type: none">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 (4mm) 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.

3.6 Removing or Installing Server Module Cover

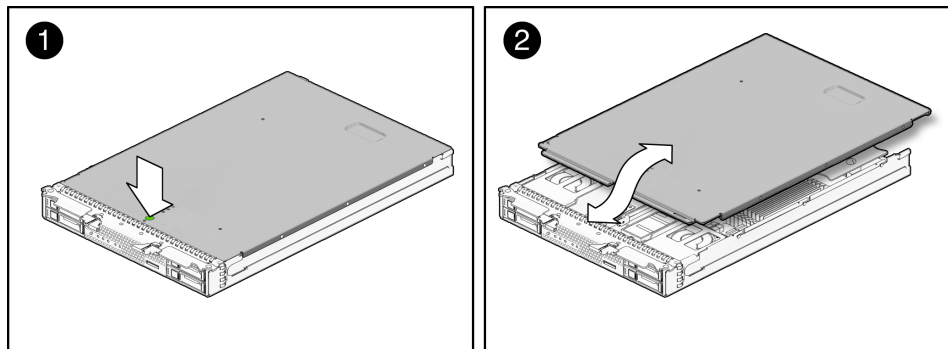
Refer to the following instructions for removing or installing the cover on the server.

▼ 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 3-3](#).

FIGURE 3-3 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 M2 Server Module Installation Guide*.

3.7 Procedures for Replaceable Components

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 service technicians. Contact your 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 M2 Server Module, click on the X6270 M2 Server Module product page at: <http://oracle.com/goto/blades>

This section contains procedures for replacing the following components:

- “Installing or Servicing a Hard Disk Drive or Solid State Drive” on page 3-10
- “Replacing the System Battery” on page 3-17
- “Installing or Replacing Memory Modules (DIMMs)” on page 3-19
- “Installing or Servicing a Fabric Expansion Module (FEM)” on page 3-21
- “Installing or Replacing a RAID Expansion Module (REM) and Battery” on page 3-22
- “Installing or Replacing a CPU and Heatsink” on page 3-26
- “Cabling the REM and Disk Drives” on page 3-32



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.

3.7.1 Installing or Servicing a Hard Disk Drive or Solid State Drive

When replacing or adding a hard disk or solid state drive on the Sun Blade X6270 M2 Server Module refer to following sections:

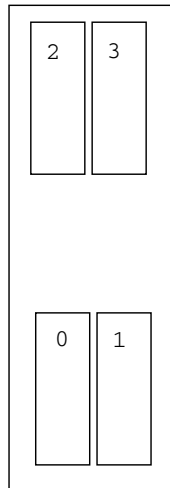
- “Internal System Software Designation for Storage Devices” on page 3-11
- “Replace an Existing HDD or SSD” on page 3-14

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

3.7.1.1 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



3.7.1.2 Add a New HDD or SSD

- 1. Locate and remove the drive filler panels from the server module bays.**

For drive locations on the server, see [FIGURE 3-4](#).

For instructions to remove drive filler panels, see [“Remove or Insert Filler Panels” on page 3-7](#).

- 2. Ensure that the release lever on the drive is in a fully opened position.**
- 3. Slide the drive into the vacant slot by pressing the middle of the drive faceplate with your thumb or finger.**

The release lever will start to close as it makes contact with the chassis.

Do not slide the drive in all the way. Leave the drive out approximately 0.25 to 0.50 inch (6 to 12 mm) from the opening.

For example:

- If adding a drive to a server module and the server module has not been installed in the system chassis, see [FIGURE 3-5](#).

or

- If adding a drive to a server module and the server module is installed in the system chassis, see [FIGURE 3-6](#).

FIGURE 3-5 Adding a Drive—Server Not Installed in Chassis

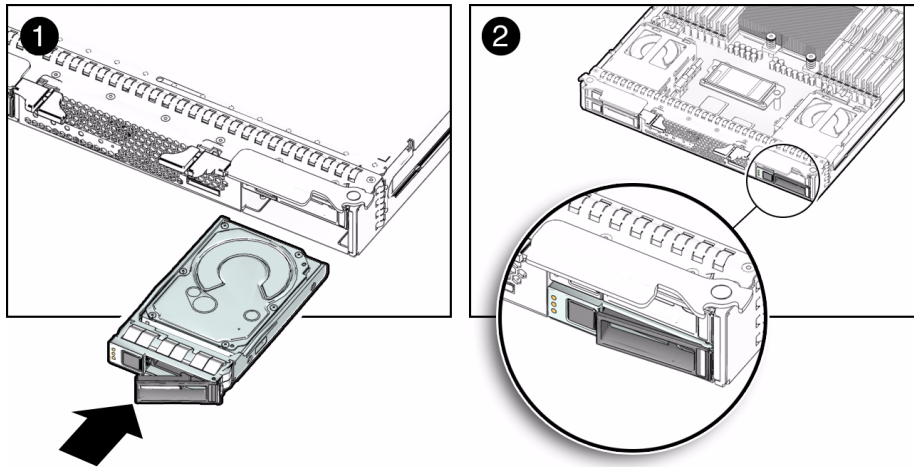
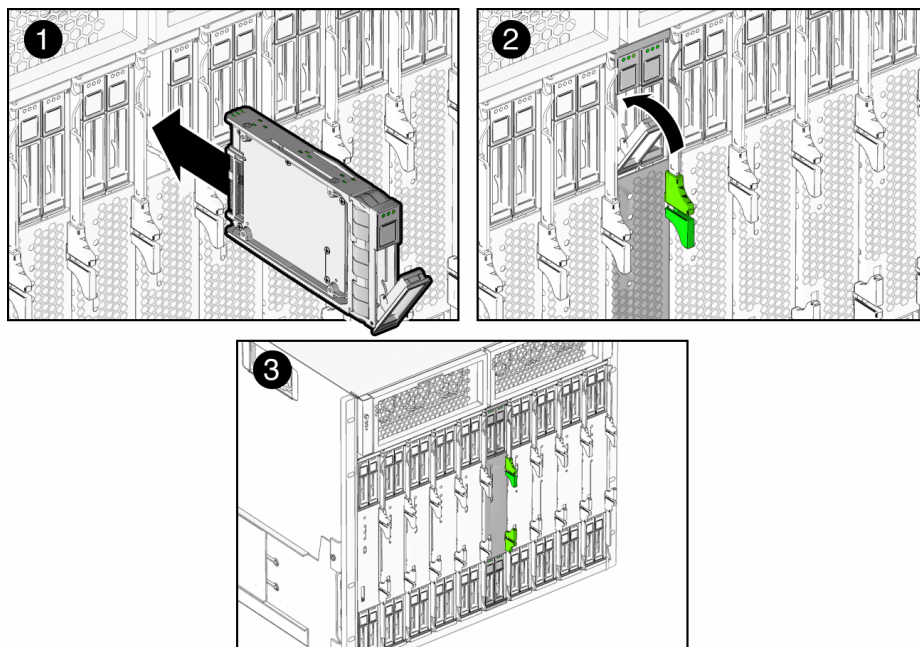


FIGURE 3-6 Adding a Drive-Server Installed in Chassis



4. Using your thumb or finger, press on the middle of the drive's faceplate until the release lever engages with the chassis.
5. Close the release lever until it clicks into place and is flush with the front of the server.

3.7.1.3 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 a 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).

3.7.1.4 Replace an Existing HDD or SSD

Note – This component is a customer replaceable unit (CRU).

Follow this procedure to replace a HDD or SSD.

1. **Observe the LEDs on the front panel of the drive to verify which drive in the server is faulty.**

FIGURE 3-7 Drive Status LEDs

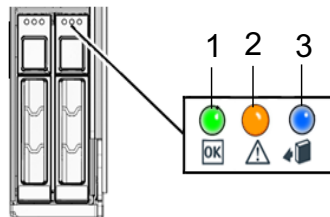


Figure Legend Drive Status LEDs

-
- | | |
|---|--|
| 1 | HDD or SSD Operational/Activity 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 drive from the server, perform the following steps:**

Note – The Sun Blade X6270 M2 Server Module drives 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 drives.

- a. Press the release lever button on the drive front panel then tilt the lever into a fully opened position.

For example:

- If removing the HDD or SSD when server is out of chassis, see [FIGURE 3-8](#).
- or
- If removing HDD or SSD when server is in chassis, see [FIGURE 3-9](#).

FIGURE 3-8 Removing Storage Device—Server Not Installed in Chassis

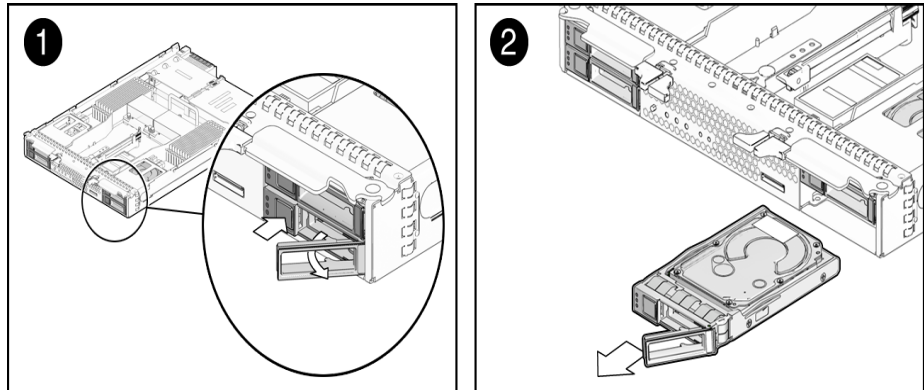
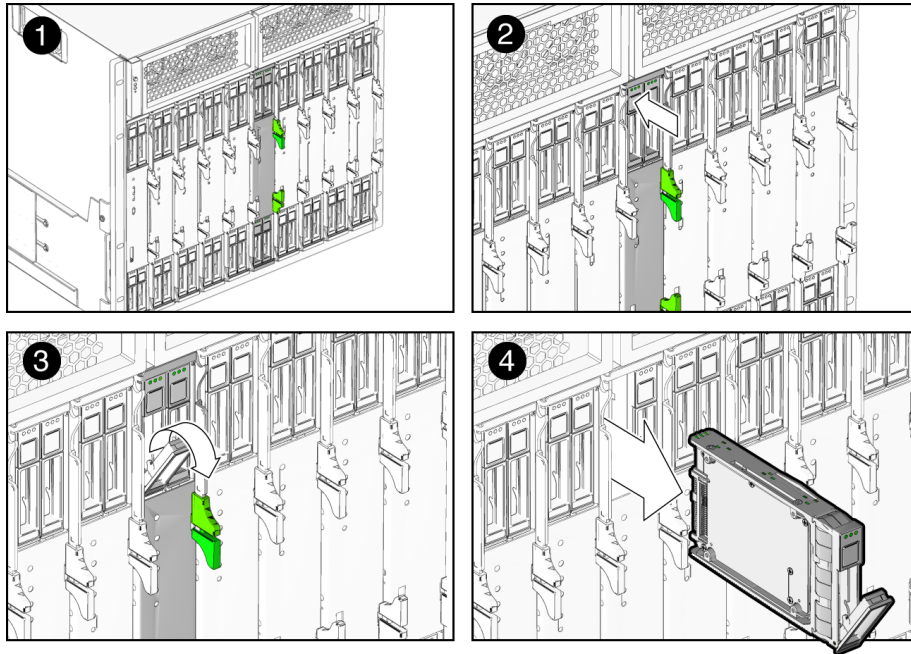


FIGURE 3-9 Removing Storage Device–Server Module Installed in Chassis



- b. Hold the opened release lever and gently slide the drive toward you.
- c. If you are not immediately replacing the drive, insert a filler panel into the empty drive slot on the server.

For details, see [“Remove or Insert Filler Panels”](#) on page 3-7.



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 [“Remove or Insert Filler Panels”](#) on page 3-7.

3. To install (or replace) the drive, perform the following steps:

- a. Ensure that the drive release lever is in a fully opened position.
- b. Slide the drive into the vacant slot by pressing the middle of the drive faceplate with your thumb or finger.

The release lever will start to close 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 (6 to 12 mm) from the opening.

- c. Using your thumb or finger, press on the middle of the drive 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.

3.7.2 Replacing the System Battery

Follow this procedure when replacing the system battery.

▼ Replace the System Battery

Note – This component is a customer-replaceable unit (CRU).

Follow this procedure 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 3-4



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 Cover From Server”](#) on page 3-9.

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

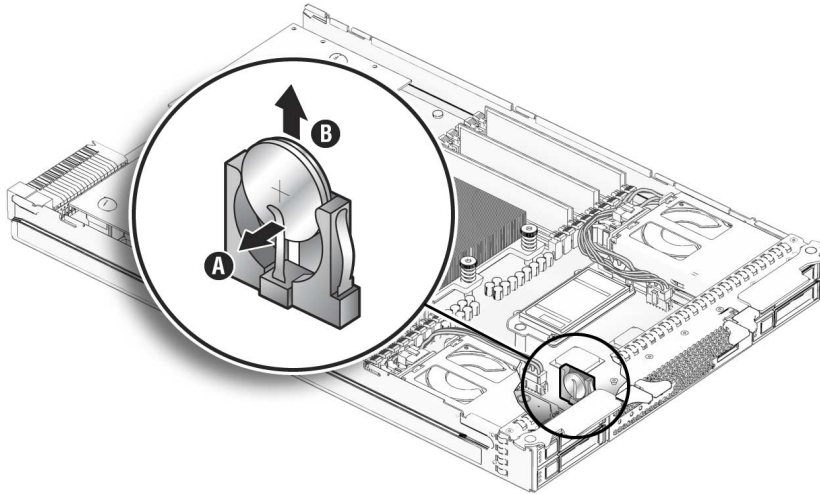


Caution – Removing the system battery will clear the CMOS and return the BIOS settings to their factory defaults. The BIOS will automatically notify you of this change the next time you boot the system.

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

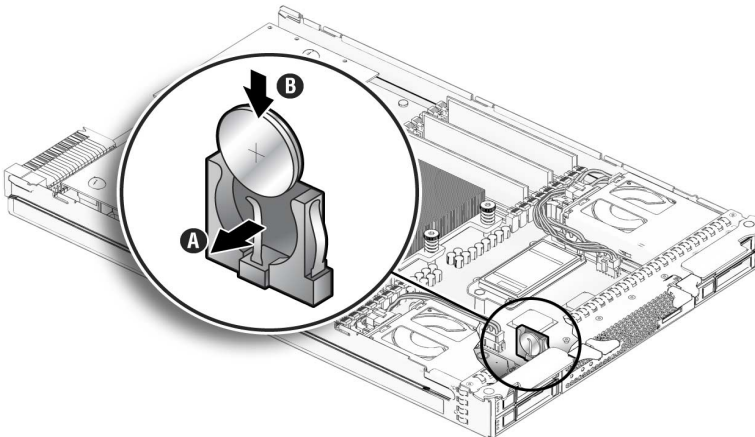
- b. Lift the battery up and out of the socket, see [FIGURE 3-10](#).

FIGURE 3-10 Removing 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 3-11](#).

FIGURE 3-11 Inserting System Battery



5. Install the cover on the server.

For instructions, see [“Install Cover on Server”](#) on page 3-9.

3.7.3 Installing or Replacing Memory Modules (DIMMs)

The Sun Blade X6270 M2 Server Module is shipped with standard memory configurations. If you ordered additional memory, a kit for the additional memory is shipped separately.

For details on DIMM considerations, such as DIMM and CPU physical layout, DIMM population rules, DIMM rank classification labels, and error correction and parity, see Appendix D, “Memory Module (DIMM) Reference” on page D-1.

▼ Replace or Add 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 3-4.



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 Cover From Server” on page 3-9.

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.

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

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 [“Remove or Insert Filler Panels”](#) on page 3-7.

FIGURE 3-12 DIMM Socket Release and Alignment

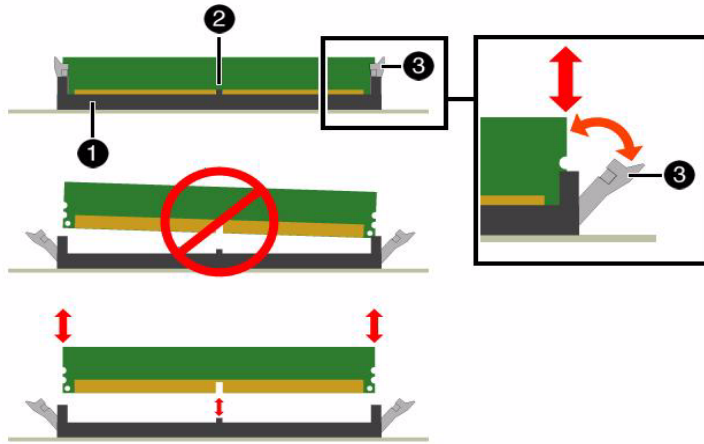


Figure Legend DIMM Socket Release and Alignment

-
- | | |
|---|---------------------|
| 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 Appendix D, [“Memory Module \(DIMM\) Reference”](#) on page D-1.

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 3-7.

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

c. 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 3-9](#).

3.7.4 Installing or Servicing a Fabric Expansion Module (FEM)

Follow these steps to remove and replace a Fabric Expansion Module (FEM) in a Sun Blade X6270 M2 Server Module.

▼ Install the FEM

Note – This component is a customer-replaceable unit (CRU).

Follow this procedure to add a FEM.

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 3-4](#).



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.

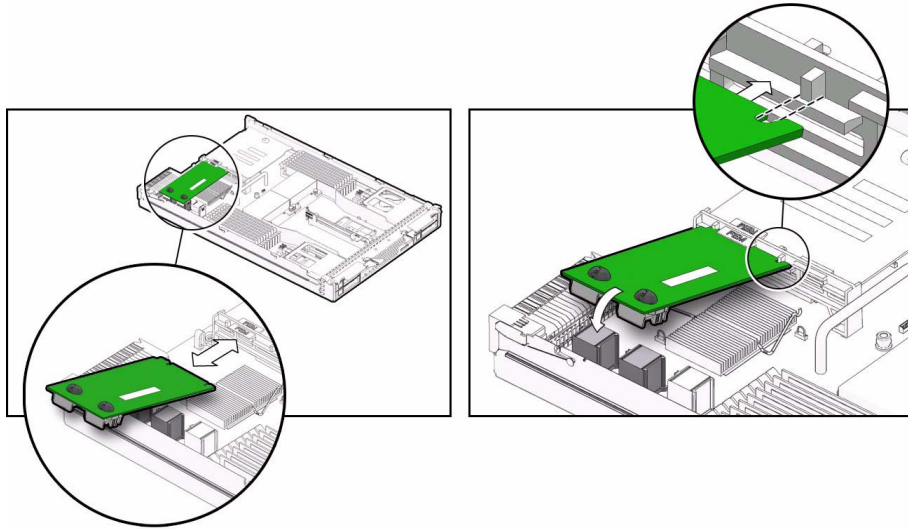
For details, see [“Remove Cover From Server” on page 3-9](#).

3. Remove the existing FEM card. See [FIGURE 3-13](#).

4. Perform the following steps to install the FEM card:

- a. Slide the FEM card at an angle into the support bracket. See [FIGURE 3-13](#).
- b. Press the FEM card carefully into the connector. See [FIGURE 3-13](#).

FIGURE 3-13 Removing and Inserting the FEM Card



5. Connect the FEM to the motherboard.

6. Install the cover on the server.

For details, see [“Install Cover on Server”](#) on page 3-9.

3.7.5 Installing or Replacing a RAID Expansion Module (REM) and Battery

The RAID expansion module (REM), if ordered, might not arrive installed on the Sun Blade X6270 M2 Server Module. In some cases, this option is shipped separately for customer installation.

The REM enables the RAID functionality for SAS drives. The Sun Blade X6270 M2 Server Module supports RAID 0, 1, 5 and 6.

Note that when adding a REM to a server, you must install one or more SAS or SATA storage drives (hard disk or solid state drive) in the server disk slots 0 through 3. For further information about the implementation and configuration of RAID on this server, consult the following disk controller documentation:

- *Sun Disk Management Document Collection* at <http://docs.sun.com/app/docs/coll/dsk-mgmt>
- *Sun StorageTek RAID Manager Software Release Notes* (820-2755)
- *Sun Intel Adaptec BIOS RAID Utility User's Manual* (820-4708)
- *Uniform Command-Line Interface User's Guide* (820-2145)
- *Sun LSI 106x RAID User's Guide* (820-4933)

To install the REM option and its battery on the Sun Blade X6270 M2 Server Module motherboard, refer to the following procedure(s).

▼ Replace the REM Battery

Follow this procedure to replace a REM battery.

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 3-4

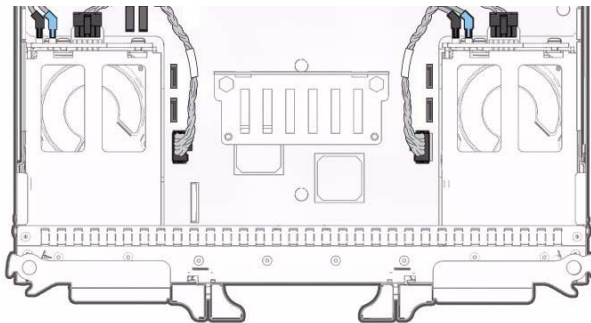


Caution – After removing the server from the chassis, ensure that a filler panel is inserted into the empty server slot to reduce the possibility of a system shut down.

2. Remove the cover from the server.

For details, see [“Remove Cover From Server”](#) on page 3-9. The REM battery is located at the front of the server between the two hard drives. See [FIGURE 3-14](#).

FIGURE 3-14 Location of the REM Battery



3. Loosen the two screws using a Phillips head screwdriver and remove the existing REM battery.
4. Press the new REM battery carefully into the connector and replace the screws.
5. Install the cover on the server.

▼ Install a New REM

Note – The REM SAS cable must be installed when using a REM. For cabling instructions, see [“Cabling the REM and Disk Drives”](#) on page 3-32.

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

See [“Remove Cover From Server”](#) on page 3-9.

2. **Locate the REM support bracket on the motherboard, and slide the REM card at an angle into the support bracket (see [FIGURE 3-15 \[1\]](#)), then press the module carefully into the connector (see [FIGURE 3-15 \[2\]](#)).**

- If you are adding a REM to a system without a REM, continue performing the remaining steps in this procedure.



Caution – The following steps will remove all data from the system. Back up your data to an external site before proceeding.

3. **(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 [“Installing or Servicing a Hard Disk Drive or Solid State Drive”](#) on page 3-10.

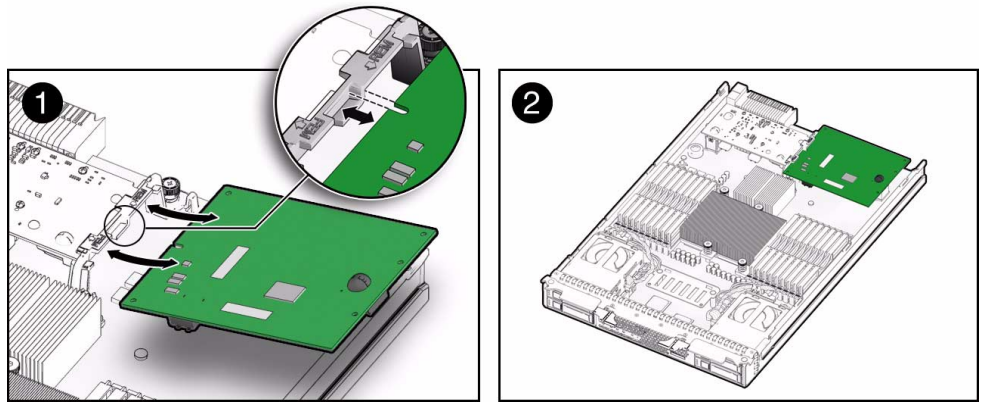
4. **Install the cover on the server.**

For instructions, see [“Install Cover on Server”](#) on page 3-9.

5. **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 M2 Server Module Installation Guide for Linux, Virtual Machine Software, and Oracle Solaris Operating Systems* (821-0497).
- To install the Windows Operating System, see the *Sun Blade X6270 M2 Server Module Installation Guide for Windows Operating Systems* (821-0498).

FIGURE 3-15 Installing REM



6. Install the cover on the server.

See “Install Cover on Server” on page 3-9.

▼ Replace an Existing REM

Note – The REM SAS cable must be installed when using a REM. For cabling instructions, see “Cabling the REM and Disk Drives” on page 3-32.

Follow this procedure to replace or add a REM.

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 3-4



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 Cover From Server” on page 3-9.

3. Remove the existing REM card.

4. Slide the REM card at an angle into the support bracket, then press it carefully into the connector. See [FIGURE 3-15](#).

For information about the implementation and configuration of RAID on this server, see the *Sun Disk Management Document Collection* at <http://docs.sun.com/app/docs/coll/dsk-mgmt>.

5. Connect the REM to the hard disk drives or solids state drives using the REM SAS cable. See “Cabling the REM and Disk Drives” on page 3-32.
6. Install the cover on the server.

3.7.6 Installing or Replacing a CPU and Heatsink

The Sun Blade X6270 M2 Server Module is shipped with a preinstalled CPU configuration. If you ordered an alternative CPU assembly option, the optional CPU assembly is shipped separately.

The CPU assembly option contains a CPU chip and a heatsink with preapplied thermal grease. CPU assembly options should only be installed by a qualified Service technician.

▼ Install CPU and Heatsink

Refer to the following procedure when adding a CPU to the Sun Blade X6270 M2 Server Module.



Caution – The CPU options are field replaceable units (FRUs) and should be installed only by a qualified Service technician.

1. Remove the cover from the server.

See “Remove Server Module From Chassis” on page 3-4.

2. Unpack the CPU kit.

The kit includes a CPU chip and a heatsink with the thermal grease preapplied.

3. Determine the CPU socket location to populate.

4. Remove the air baffle and filler panel from the CPU socket

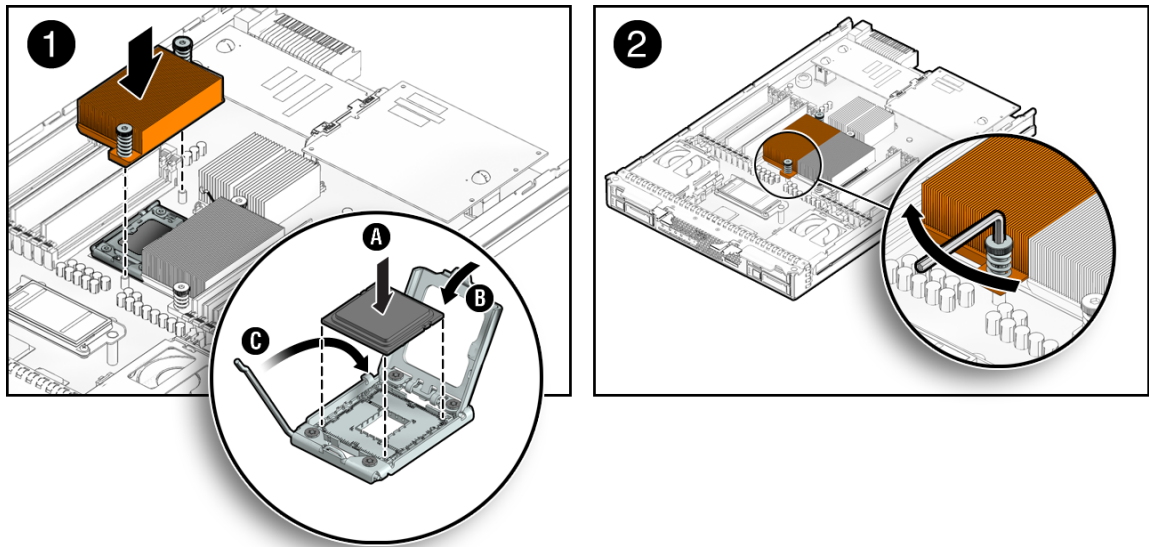
If you are adding a second CPU to the motherboard for the first time and the CPU is covered by an air baffle, you will need to remove the air baffle and filler panel inside the CPU socket prior to adding the CPU. For instructions, see “Remove or Insert Filler Panels” on page 3-7.

5. Install the CPU (see [FIGURE 3-16](#)).

- a. Properly orient the CPU with the socket alignment tabs and carefully place the CPU into the socket.

Ensure that the orientation is correct as damage might result if the CPU pins are not aligned correctly.

FIGURE 3-16 Installing a CPU



- b. Lower the pressure frame.

Ensure that the pressure frame sits flat around the periphery of the CPU.

- c. Engage the release lever by rotating it downward and slipping it under the catch.

- d. Each heatsink has a long-ear tab and a short-ear tab through which the screws attach to mounting studs. See Frame 1 of [FIGURE 3-16](#). To correctly orient the heatsinks, position each long-ear tab closest to the DIMM slots associated with that CPU. The final result will show the heatsinks lined up evenly in the front and rear with silkscreen lines on the motherboard.



Caution – When handling the heatsink, be careful not get the thermal grease on your fingers so as not to transfer the grease to other server components. To do so could cause component contamination and/or damage.

- e. Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.



Caution – If the heatsink assembly is moved too much during its installation, the layer of thermal grease might not be distributed evenly, leading to component damage.

- f. Tighten the screws alternately one-half turn until fully seated.

6. Install the cover on the server.

See [“Install Cover on Server” on page 3-9](#).

▼ Replace or Upgrade CPU and Heatsink

Follow these steps to replace or upgrade the CPU and Heatsink.

Note – This component is a field-replaceable unit (FRU) and should be replaced *only* by qualified Service technicians. Contact your Service representative for assistance.

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 3-4](#)



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.

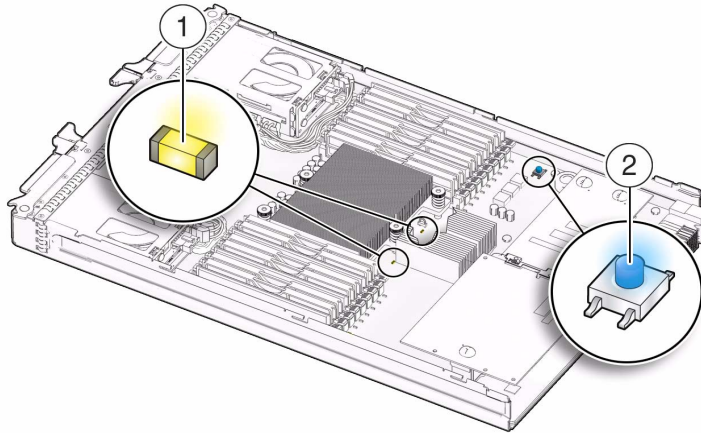
For details, see [“Remove Cover From Server” on page 3-9](#).

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 3-17](#).

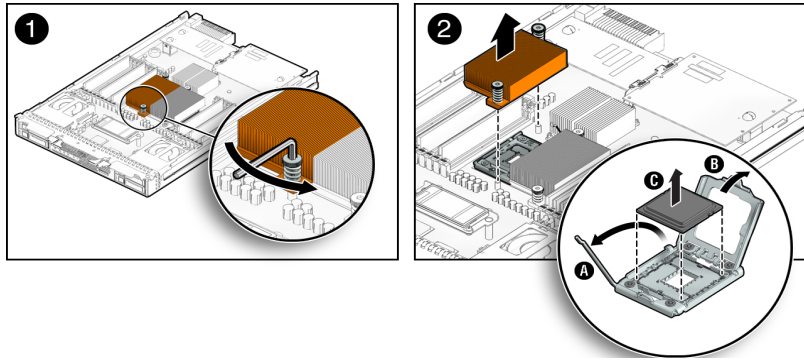
- If CPU LED is off: CPU is operational.
- If CPU LED is lit (amber): CPU has encountered a fault condition and should be replaced.

FIGURE 3-17 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. Using an Allen wrench, turn the screws 180 degrees at a time, and then remove the screws when they are detached. See [FIGURE 3-18](#) [1].
 - iii. Twist the heatsink slightly to lift it off the motherboard. Turn the heatsink upside down and allow the spring in each of the mounting holes to fall out into your hand.
 - iv. Clean old thermal grease from existing CPU as soon as the CPU is removed. If you are reinstalling the existing CPU, use an alcohol pad to clean all the old thermal grease from the component surface. Also clean grease from the old CPU chip before removing so as not to contaminate your fingers during removal, which could then lead to further contamination of the newly installed CPU.

FIGURE 3-18 Removing Heatsink and CPU



Note – Set the heatsink upside down on a clean, flat surface to prevent the thermal grease from contaminating other components.

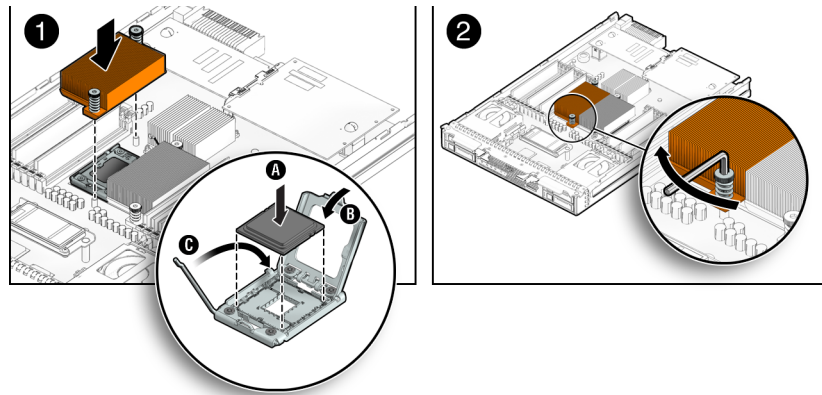
- c. To remove the faulty CPU from the CPU socket, perform the following steps. See [FIGURE 3-18](#) [2].
 - i. Pivot the socket lever up, into the fully open position.
 - ii. Open the hinged plate that covers the CPU until it is in the fully open position.
 - iii. Lift the CPU out of the socket, leaving the lever and plate in the open position.
4. To install (or reinstall) a CPU, perform the following steps.
 - 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 3-7.
 - 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. See [FIGURE 3-19](#).

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

FIGURE 3-19 Installing 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 [FIGURE 3-19](#) [1].
 - 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 heatsink 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.
 - b. Turn the heatsink upright and reinsert the mounting screws. See [FIGURE 3-19](#) [2].



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 with the silkscreen on the PCB before you place it on the CPU.

d. Lower the heatsink onto the CPU, aligning the mounting screws with their holes on the motherboard.

Each heatsink has a long-ear tab and a short-ear tab through which the screws attach to mounting studs. See Frame 1 of [FIGURE 3-16](#). To correctly orient the heatsinks, position each long-ear tab closest to the DIMM slots associated with that CPU. The final result will show the heatsinks lined up evenly in the front and rear with silkscreen lines 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 [“Install Cover on Server”](#) on page 3-9.

3.7.7 Cabling the REM and Disk Drives

The REM, and disk drives on the Sun Blade X6270 M2 Server Module require different cabling depending on the option that is chosen. [FIGURE 3-20](#) shows the REM installed and cabled directly to the disk drives.

▼ Identify the Proper Cabling Paths

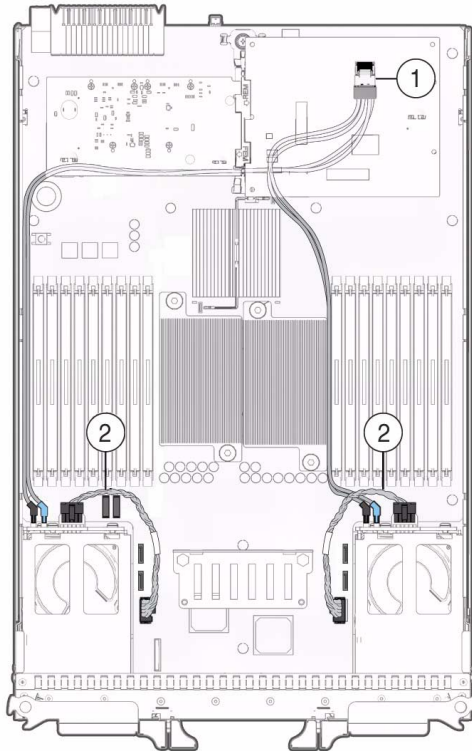
[FIGURE 3-20](#) illustrates cabling paths for the REM (1) and hard drive power (2).

1. Use the REM SAS cable (see cable 1 in [FIGURE 3-20](#)) to connect the REM to the SATA hard disk or solid state drives.

Note – The hard disk drive and solid state drive connect to the REM. The SATA drive connects to the onboard chipset or directly to the REM. For SAS or SSD, you must connect to the REM.

2. Use the power cables (see cable 2 in [FIGURE 3-20](#)) to provide power to the disk drives.

FIGURE 3-20 REM Cabled Directly to Disk Drives



▼ Connect Disk Drives to the Onboard Chipset

[FIGURE 3-21](#) illustrates the cabling scheme used to connect the disk drives directly to the onboard chipset.

1. Use the ICH10 R SATA cable (see cable 2 in [FIGURE 3-21](#)) to connect the SATA HDD to the onboard chipset.



Caution – The ICH10 R SATA cable jacks are sized to fit the blue or black onboard connection. Do not force the jacks when making a connection.

FIGURE 3-21 Disk Drives Cabled Directly to Onboard Chipset

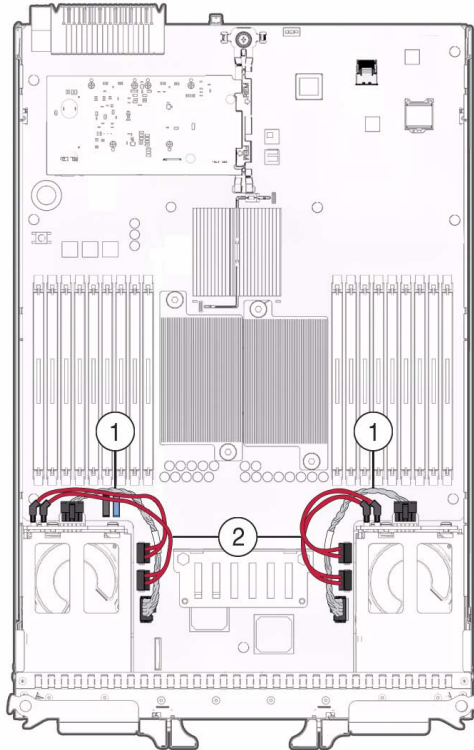


Figure Legend

-
- | | | |
|---|----------------------|--------------------|
| 1 | Part Number 530-4037 | Power Cables |
| 2 | Part Number 530-3993 | ICH10 R SATA Cable |
-

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 service processor (SP) password and serial connection defaults in ILOM, as well as how to restore your ILOM SP firmware.

- Section 4.1, “Troubleshooting the Server” on page 4-2
 - Section 4.1.1, “Diagnostic Tools” on page 4-2
 - Section 4.1.2, “Diagnostic Tool Documentation” on page 4-4
- Section 4.2, “Restoring ILOM Defaults” on page 4-6
 - Section 4.2.1, “Accessing the Preboot Menu” on page 4-6
 - Section 4.2.2, “Restoring the Factory Default ILOM Root Password” on page 4-12
 - Section 4.2.3, “Restoring ILOM Access to the Serial Console” on page 4-13
 - Section 4.2.4, “Restoring the SP Firmware Image” on page 4-14
 - Section 4.2.5, “Preboot Menu Command Summary” on page 4-18

4.1 Troubleshooting the Server

The Sun Blade X6270 M2 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

A suite of diagnostic tools, each of which has its own specific strengths and applications is available for troubleshooting server issues. For more information about which tool might be best to use for your purpose, and where to locate information about these tools, see:

- [“Diagnostic Tools” on page 4-2](#)
- [“Diagnostic Tool Documentation” on page 4-4](#)

4.1.1 Diagnostic Tools

There is 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 Server 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. Note - Fault Remind LEDs are available for a few minutes after the power is removed.	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 tests aspects of the 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 Server 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	<ul style="list-style-type: none"> • <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection</i> • <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Blade X6270 M2 Server Module</i> <p>Locate the latest version of these guides at:</p> <ul style="list-style-type: none"> • http://docs.sun.com/app/docs/prod/blade.x6270m2#hic
Preboot Menu	<ul style="list-style-type: none"> • Section 4.2, “Restoring ILOM Defaults” on page 4-6
LEDs; or System indicators and sensors	<ul style="list-style-type: none"> • <i>Sun Blade X6270 M2 Server Module Service Manual</i> • <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection</i> • <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Blade X6270 M2 Server Module</i> <p>Locate the latest version of these guides at:</p> <ul style="list-style-type: none"> • http://docs.sun.com/app/docs/prod/blade.x6270m2#hic

TABLE 4-2 Summary of Documentation for Sun Diagnostic Tools (Continued)

Diagnostic Tool	Where to Find Information
POST	<ul style="list-style-type: none">• Section 2.2, “About the BIOS” on page 2-5• Section 2.2.1.2, “Default BIOS Power-On Self-Test (POST) Events” on page 2-6• Section 2.2.1.3, “BIOS POST F1 and F2 Errors” on page 2-7• Section 2.2.1.4, “How BIOS POST Memory Testing Works” on page 2-10
U-Boot or Pc-Check	<ul style="list-style-type: none">• <i>Oracle x86 Servers Diagnostics Guide</i> Locate the latest version of this guide at: <ul style="list-style-type: none">• http://docs.sun.com/app/docs/prod/blade.x6270m2#hic
Solaris commands	Locate the latest Solaris command information for Solaris 10 at: <ul style="list-style-type: none">• http://docs.sun.com/app/docs/doc/817-0550/eqxqt?a=view
SunVTS	Locate the latest documentation for SunVTS at: <ul style="list-style-type: none">• 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:

- [Section 4.2.1, "Accessing the Preboot Menu" on page 4-6](#)
- [Section 4.2.2, "Restoring the Factory Default ILOM Root Password" on page 4-12](#)
- [Section 4.2.3, "Restoring ILOM Access to the Serial Console" on page 4-13](#)
- [Section 4.2.4, "Restoring the SP Firmware Image" on page 4-14](#)
- [Section 4.2.5, "Preboot Menu Command Summary" on page 4-18](#)

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 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 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” on page 4-7](#)
- [“Access to the Preboot Menu” on page 4-7](#)
- [“Edit Preboot Menu for Remote Serial Access” on page 4-9](#)

4.2.1.1 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 1-5](#).

For instructions for accessing the Preboot Menu by using the Locate button, see [“Access to the Preboot Menu” on page 4-7](#).

- For remote serial access to the Preboot Menu (typing **xyzyz** 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 4-7](#).
- b. Edit the settings in the Preboot Menu to enable remote access as described in [“Edit Preboot Menu for Remote Serial Access” 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 KVM 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 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 server module.

- 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 **xyzyy** when you see the message:

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

Note – You cannot interrupt the ILOM boot process by typing **xyzyy** until you have configured the settings as described in [“Edit Preboot Menu for Remote Serial Access”](#) 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 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 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 4-13.
- Restore the SP firmware image.
For instructions, see [“Restore the SP Firmware Image Using the Preboot Menu”](#) on page 4-17.
- Review the commands supported in the Preboot Menu.
For command details, see [“Preboot Menu Command Summary”](#) on page 4-18.

▼ Edit Preboot Menu for Remote Serial Access

1. **Access the Preboot Menu as described in [“Access to the Preboot Menu”](#) on page 4-7.**
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 redisplay 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 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>
```

4.2.1.2 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
<code>baudrate</code>	Sets the baud rate of the serial port. Selections include 9600,19200, 38400, 57600, and 115200.
<code>serial_is_host</code>	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 4-13.
<code>bootdelay</code>	The number of seconds the bootstrap process waits for the user to enter xyzzy before booting the SP. Selections include 3, 10, or 30 .
<code>bootretry</code>	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.
<code>preferred</code>	Unused
<code>preserve_conf</code>	Setting this to <code>no</code> duplicates the function of the <code>unconfig ilom_conf</code> command, which resets many ILOM configuration settings, but preserves SP network, <code>baudrate</code> , and <code>check_physical_presence</code> the next time the SP is booted.
<code>preserve_users</code>	Setting this to <code>no</code> duplicates the function of the <code>unconfig users</code> command, which resets user information to the default values the next time the SP is booted.
<code>preserve_password</code>	Setting this to <code>no</code> duplicates the function of the <code>unconfig password</code> command, which resets the root password to the default value the next time the SP is booted.
<code>check_physical_presence</code>	If this is set to <code>Yes</code> , you must press and hold the Locate button to interrupt the SP boot process. If it is set to <code>No</code> , the boot process prompts you to interrupt it. See “Edit Preboot Menu for Remote Serial Access” 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 [“Accessing the Preboot Menu”](#) on page 4-6.

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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement Guide for Sun Blade X6270 M2 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 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 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection*. If ILOM is unavailable, you can use the Preboot Menu to restore the SP firmware image.

Note – To restore the SP firmware image using the Preboot Menu, you must be an authorized 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 4-15
- [“Enable Support in Preboot Menu to Recover the SP”](#) on page 15
- [“Restore the SP Firmware Image Using the Preboot Menu”](#) on page 4-17

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.

- You must be an authorized 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.

▼ Enable Support in Preboot Menu to Recover the SP

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 4-17](#).

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

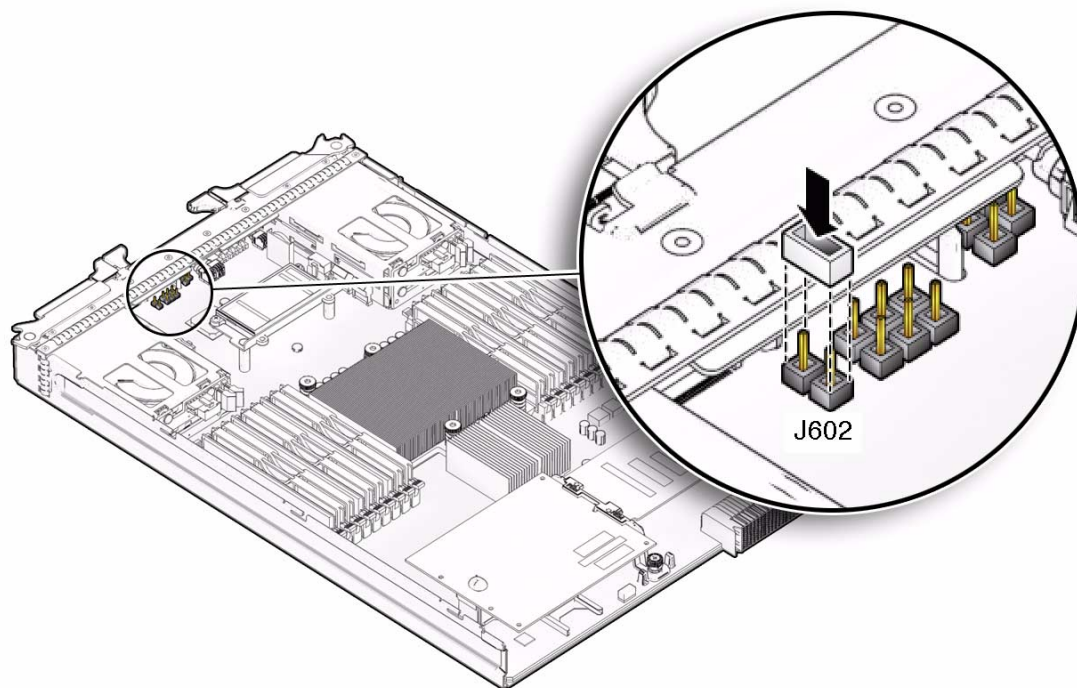
1. **Prepare the server for service by powering down the server, removing the server module from the system chassis, then removing the server cover.**

For instructions, see the following sections:

- [“Powering On and Off the Server Module” on page 2-2](#)
- [“Remove Server Module From Chassis” on page 3-4](#)
- [“Removing or Installing Server Module Cover” on page 3-8](#)

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:

- [“Removing or Installing Server Module Cover”](#) on page 3-8
- [“Installing the Server Module Into System Chassis”](#) in the *Sun Blade X6270 M2 Server Module Installation Guide* (821-0495).
- [“Powering On and Off the Server Module”](#) on page 2-2

4. Follow the instructions for restoring the SP firmware using the Preboot Menu in [“Restore the SP Firmware Image Using the Preboot Menu”](#) on page 4-17.

Note – The Preboot Menu firmware recovery process must be performed by an authorized 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 “Power Off and Verify Server Is Ready for Removal From Chassis” on page 2-3.
- b. **Remove the server module from the chassis.**
See “Remove Server Module From Chassis” on page 3-4.
- c. **Remove the top cover from the server.**
See “Remove Cover From Server” on page 3-8.
- d. **Remove the jumper from J602. See FIGURE 4-1 for the location of the J602 jumper.**
- e. **Replace the top cover.**
See “Install Cover on Server” on page 3-8.
- f. **Return the server module into the chassis.**
See “Installing the Server Module Into System Chassis” in the *Sun Blade X6270 M2 Server Module Installation Guide* (821-0495).
- g. **Power on the server.**
See “Power On the Server Module” on page 2-2.

▼ 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 4-6.**
2. **At the `Preboot>` prompt, type:**



Caution – The use of the `net flash` command is reserved for use by authorized 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 name.

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
<code>boot</code>	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 <code>reset warm</code> command instead.
<code>vers</code>	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.
<code>help</code>	Displays a list of commands and parameters.
<code>show</code>	Displays a list of SP settings.
<code>edit</code>	Starts an interactive dialog that prompts and changes settings one-by-one. See “Edit Mode Settings in Preboot Menu” on page 4-11 for details.
<code>diag</code>	Runs the U-Boot diagnostic tests in manual mode. See the <i>Oracle x86 Servers Diagnostics Guide</i> for more on U-Boot diagnostic tests.

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

Command	Description
host	<p data-bbox="546 239 1011 262">Initiates various activities related to the host.</p> <ul data-bbox="546 305 1129 366" style="list-style-type: none"><li data-bbox="546 305 1082 331">• <code>clearcmos</code> – Clears CMOS and BIOS passwords.<li data-bbox="546 340 1129 366">• <code>console</code> – Connects SP console to host serial console. <p data-bbox="546 401 865 427">Note - Type <code>Ctrl \ q</code> to quit.</p> <ul data-bbox="546 461 1286 548" style="list-style-type: none"><li data-bbox="546 461 1058 487">• <code>show</code> – Shows information about the host state.<li data-bbox="546 496 1286 548">• <code>enable-on</code> – Enables the front-panel Power button, which is usually disabled unless ILOM is running. <p data-bbox="546 591 1300 670">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.</p> <ul data-bbox="546 713 893 739" style="list-style-type: none"><li data-bbox="546 713 893 739">• <code>hard-off</code> – Turns the host off.

TABLE 4-4 Preboot Menu Commands (Continued)

Command	Description
net	<p>{ config dhcp ping flash }</p> <ul style="list-style-type: none">• config – Starts a dialog that enables you to change the ILOM network settings.• dhcp – Changes the network addressing from static to DHCP. <p>Note - You must set <code>ipdiscovery = dhcp</code> using the <code>net config</code> command first.</p> <ul style="list-style-type: none">• ping – Sends a ping.• flash – Downloads an ILOM firmware image. See “Restoring the SP Firmware Image” on page 4-14 for details. <p>Type help net command for more details on these commands.</p>
reset	<p>{ warm cold }. Resets the SP and the host.</p> <ul style="list-style-type: none">• 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	<p>{ users ilom_conf most all }</p> <p>Causes ILOM to erase any configuration information and returns the values to defaults the next time ILOM boots.</p> <ul style="list-style-type: none">• 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 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 SP network and baud rate, preferred, and check_physical_presence settings.• all – Resets all SP data storage and settings. <p>Booting ILOM restores other defaults.</p> <p>Note - None of these options erases the dynamic FRU PROMs.</p>

Server Module Specifications

This appendix contains physical specifications for the Sun Blade X6270 M2 Server Module. Refer to the chassis documentation for additional server module specifications.

- [Section A.1, “Physical Specifications” on page A-2](#)
- [Section A.2, “Electrical Specifications” on page A-2](#)
- [Section A.3, “Environmental Requirements” on page A-3](#)

A.1 Physical Specifications

The Sun Blade X6270 M2 Server Module is designed to be installed in a Sun Blade 6000 Modular System chassis.

TABLE A-1 gives the physical specifications for the Sun Blade X6270 M2 Server Module.

TABLE A-1 Sun Blade X6270 M2 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 M2 Server Module is 12.9 x 20.1 x 1.7 inches. 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 M2 Server Module.

TABLE A-2 Sun Blade X6270 M2 Server Module Environmental Requirements

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

Configuring BIOS Settings

This appendix describes how to view and/or modify the Basic Input/Output System (BIOS) settings on the server. The BIOS Setup Utility reports system information and can be used to configure the server BIOS settings.

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.

BIOS has a Setup Utility stored in the BIOS flash memory. The configured 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 default to the original state specified at the factory.

The following topics are covered:

- [Section B.1, “BIOS Setup Screens Overview”](#) on page B-2
- [Section B.2, “BIOS Setup Utility Menu Screens”](#) on page B-3

For information on accessing BIOS, see [Section 2.2, “About the BIOS”](#) on page 2-5.

B.1 BIOS Setup Screens Overview

TABLE B-1 contains summary descriptions of the top-level BIOS setup screens.

TABLE B-1 BIOS Setup Screens Summary

Screen	Description	See This Section
Main	General product information, including BIOS type, processor, memory, and time/date.	Section B.2.1, "BIOS Main Menu Screens" on page B-4
Advanced	Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other information.	Section B.2.2, "BIOS Advanced Menu Screens" on page B-5
PCI	Configure the server to clear NVRAM during system boot.	Section B.2.3, "BIOS PCI Menu Screen" on page B-6
Boot	Configure the boot device priority (storage drives and the DVD-ROM drive).	Section B.2.4, "BIOS Boot Menu Screens" on page B-7
Security	Set or change the user and supervisor passwords.	Section B.2.5, "BIOS Security Menu Screen" on page B-8
Chipset	View the configuration of server chipsets.	Section B.2.6, "BIOS Chipset Menu Screens" on page B-9
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail-safe defaults.	Section B.2.7, "BIOS Exit Menu Screen" on page B-10

See Section B.2, "BIOS Setup Utility Menu Screens" on page B-3 for examples of each of these screens.

B.2 BIOS Setup Utility Menu Screens

This section shows samples of the BIOS Setup Utility screens. All screens reflect the optimal defaults at startup.

Note – The screens shown are examples. The version numbers and the screen content and selections shown are subject to change over the life of the product.

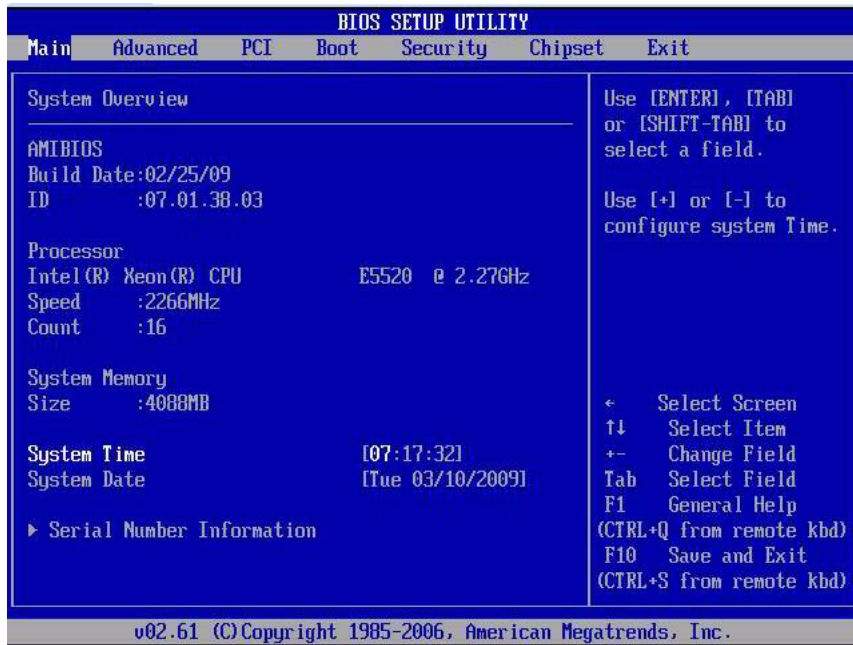
The following topics are covered:

- Section B.2.1, “BIOS Main Menu Screens” on page B-4
- Section B.2.2, “BIOS Advanced Menu Screens” on page B-5
- Section B.2.3, “BIOS PCI Menu Screen” on page B-6
- Section B.2.4, “BIOS Boot Menu Screens” on page B-7
- Section B.2.5, “BIOS Security Menu Screen” on page B-8
- Section B.2.6, “BIOS Chipset Menu Screens” on page B-9
- Section B.2.7, “BIOS Exit Menu Screen” on page B-10

B.2.1 BIOS Main Menu Screens

The BIOS Main screens provide general product information, including BIOS, processor, system memory, and system time/date. FIGURE B-1 shows the BIOS Main top-level screen.

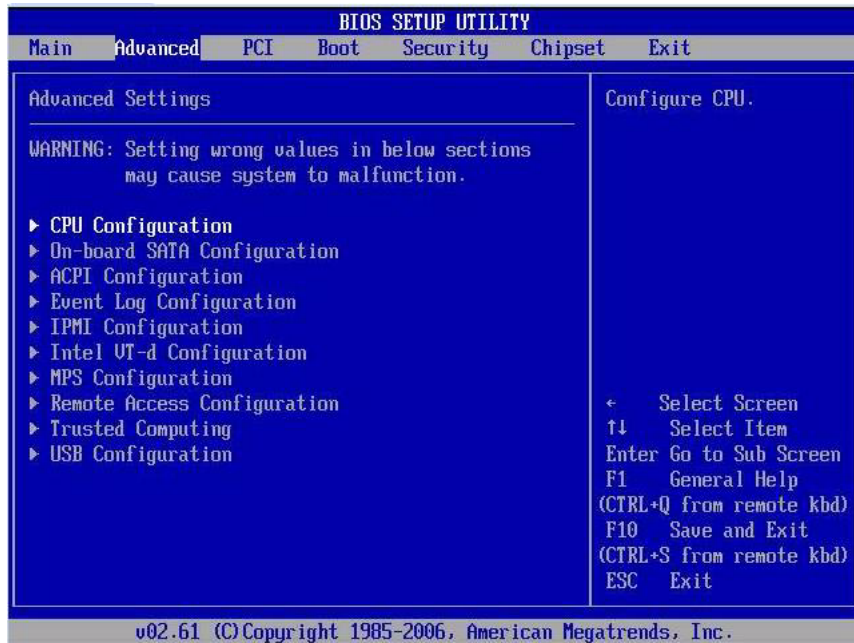
FIGURE B-1 BIOS Setup Utility: Main – System Overview



B.2.2 BIOS Advanced Menu Screens

The BIOS Advanced screens provide detailed configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other system information. FIGURE B-2 shows the BIOS Advanced top-level screen.

FIGURE B-2 BIOS Setup Utility: Advanced – Advanced Settings



B.2.3 BIOS PCI Menu Screen

The BIOS PCI screen enables you to configure the server to clear NVRAM during system boot. [FIGURE B-3](#) shows the BIOS PCI screen.

FIGURE B-3 BIOS Setup Utility: PCI – Advanced PCI Settings



B.2.4 BIOS Boot Menu Screens

The BIOS Boot screens enable you to configure the boot device priority (storage drives and the DVD-ROM drive). [FIGURE B-4](#) shows the BIOS Boot top-level screen.

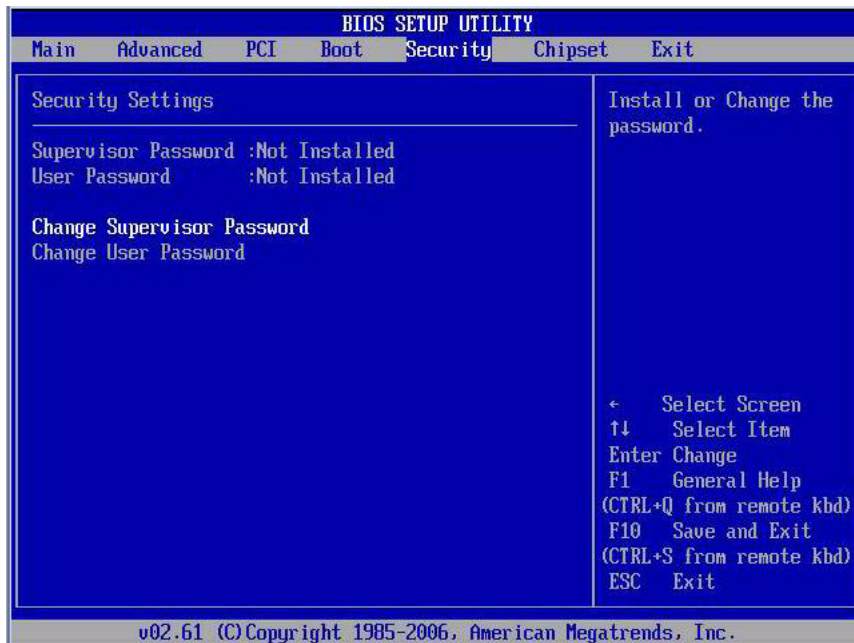
FIGURE B-4 BIOS Setup Utility: Boot – Boot Settings



B.2.5 BIOS Security Menu Screen

The BIOS Security screen enables you to set or change the supervisor and user passwords. [FIGURE B-5](#) shows the BIOS Security screen.

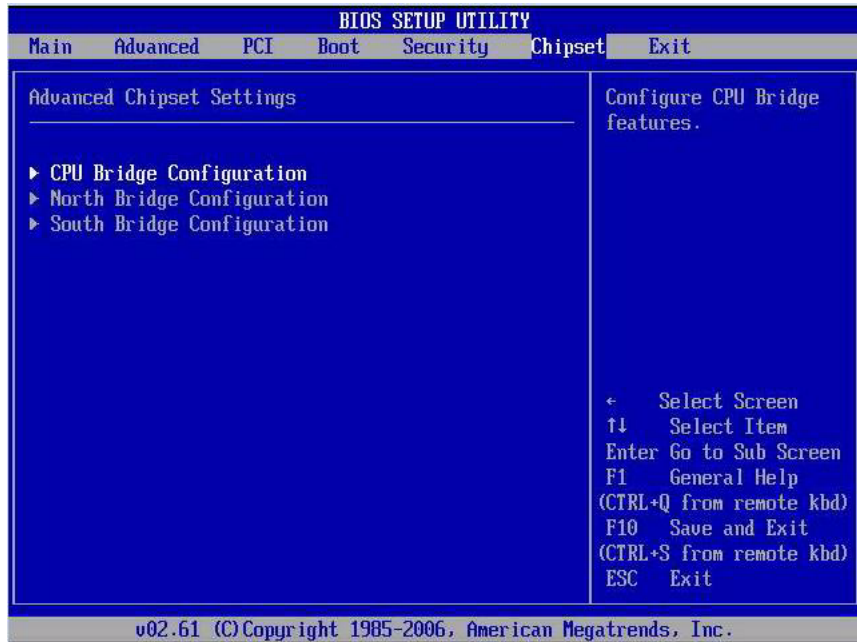
FIGURE B-5 BIOS Setup Utility: Security – Security Settings



B.2.6 BIOS Chipset Menu Screens

The BIOS Chipset screens enable you to set the chipset parameters. [FIGURE B-6](#) shows the BIOS Chipset top-level screen.

FIGURE B-6 BIOS Setup Utility: Chipset – Advanced Chipset Settings



B.2.7 BIOS Exit Menu Screen

The BIOS Exit options enable you to save changes and exit, discard changes and exit, discard changes, or load optimal defaults. FIGURE B-7 shows the BIOS Exit screen.

FIGURE B-7 BIOS Setup Utility: Exit – Exit Options - Save Changes and Exit



▼ Executing a BIOS Exit Option

1. Use the up and down arrow keys to scroll up and down the BIOS Exit options.
2. Press Enter to select the option.

A confirmation dialog box appears that enables you to save the changes and exit the Setup Utility or cancel the exit option.

Note – The confirmation dialog box is only shown below for the Save Changes and Exit option screen.

Connector Pinouts

This appendix contains information about the following connector pinouts:

- Section C.1, “3-Cable Dongle Pinouts” on page C-2
- Section C.2, “SAS/SATA Connectors” on page C-4
- Section C.3, “SAS Diskplane” on page C-6
- Section C.4, “SAS Power/LED Connector” on page C-7

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)

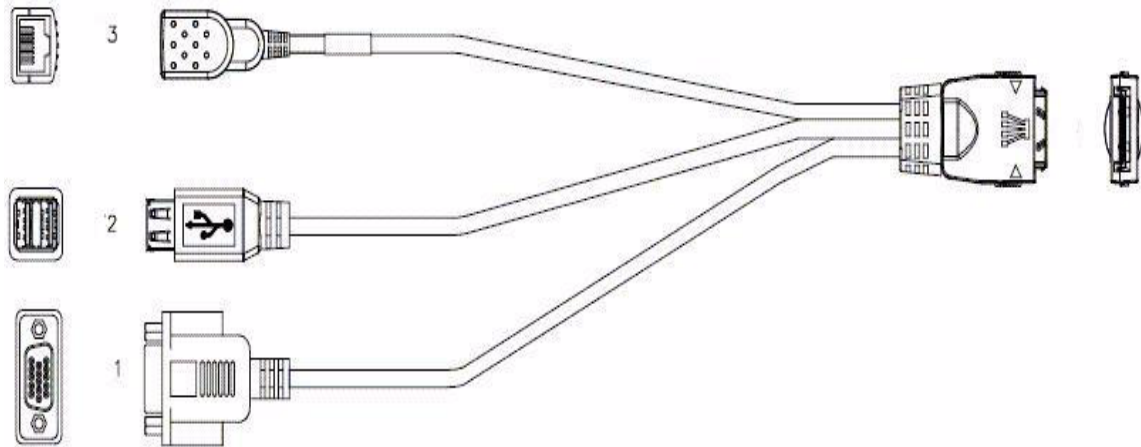


Figure Legend Pinouts for 3-Cable Dongle Connectors (Option# 4622A)

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	Trasmit 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 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-2 SAS/SATA Connector

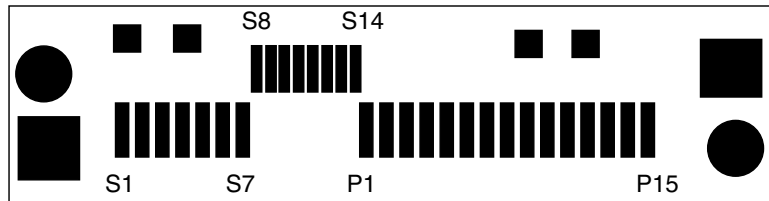


TABLE C-1 SAS/SATA Connector Pins

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	Ready LED	Activity/Ready LED
	P12	Gnd	First mate ground
	P13	12.0 V	Pre-charge, second mate
	P14	12.0 V	
	P15	12.0 V	

C.3 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.4 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-3 SAS Power/LED Connector

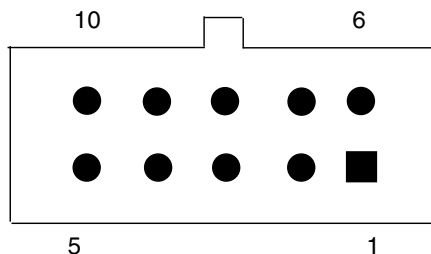


TABLE C-3 SAS Power/LED Connector Pins

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

Memory Module (DIMM) Reference

When replacing or upgrading a DIMM on the Sun Blade X6270 M2 Server Module, see the following sections:

- [Section D.1, “Memory Module Installation Considerations”](#) on page D-1
 - [Section D.1.1, “DIMM and CPU Physical Layout”](#) on page D-2
 - [Section D.1.2, “DIMM Population Rules”](#) on page D-3
 - [Section D.1.3, “DIMM Rank Classification Labels”](#) on page D-4
 - [Section D.1.4, “Error Correction and Parity”](#) on page D-5
 - [Section D.1.5, “Inconsistencies Between DIMM Fault LEDs and the BIOS Mapping of Faulty DIMMs”](#) on page D-5
 - [Section D.1.6, “Locations of Faulty DIMMs Using ILOM Versus BIOS”](#) on page D-5

D.1 Memory Module Installation Considerations

The Sun Blade X6270 M2 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 M2 Server Module, you should consider the following:

- Physical layout of the DIMMs and CPUs
For details, see [“DIMM and CPU Physical Layout”](#) on page D-2.
- DIMM population rules
For details, see [“DIMM Population Rules”](#) on page D-3.
- DIMM classification labels

For details, see “DIMM Rank Classification Labels” on page D-4.

- Error correction and parity

For details, see “Error Correction and Parity” on page D-5

D.1.1 DIMM and CPU Physical Layout

The physical layout of the DIMMs and CPUs on a Sun Blade X6270 M2 Server Module is shown in [FIGURE D-1](#).

FIGURE D-1 CPU and DIMM Physical Layout

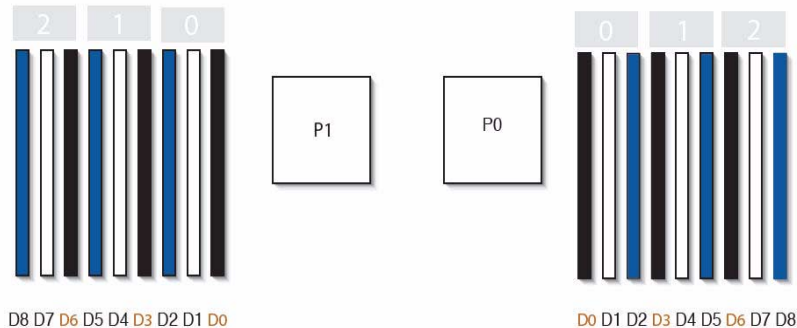


Figure Legend CPU and DIMM Physical Layout

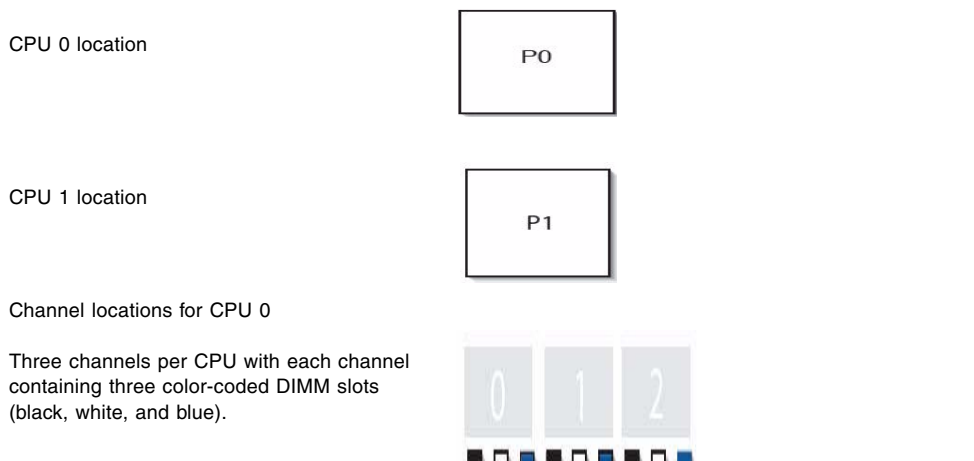


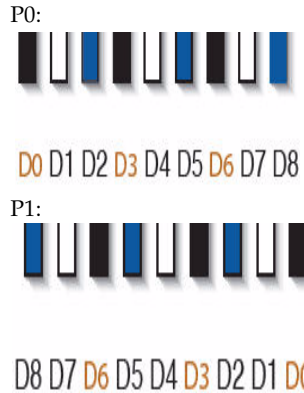
Figure Legend CPU and DIMM Physical Layout (Continued)

Channel locations for CPU 1

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



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



D.1.2 DIMM Population Rules

The DIMM population rules for the Sun Blade X6270 M2 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. Each CPU can support single DIMMs or two DIMMs per channel.
4. Each CPU can support a single DIMM in channel 0, or one DIMM each in channels 0 and 1.
5. A server CPU will support both 1.35v and 1.5v DIMMs, but will default to the higher voltage.
6. 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 D-1](#).

- 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 D-1](#).

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

7. 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 D-1](#) for further details.

TABLE D-1 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 DIMMs¹)
 - 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.

D.1.3 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 D-2](#) identifies the corresponding rank classification label shipped with each DIMM.

TABLE D-2 DIMM Classification Labels

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

D.1.4 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
- 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 *Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection* for information on how to access the error log.

D.1.5 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.dim 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)*.

D.1.6 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 D-3 shows the mapping of faulty DIMM locations as reported by ILOM and BIOS.

TABLE D-3 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

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