Sun Server X4-2

Service Manual

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Contents

Using This Documentation

This service manual explains how to remove and replace parts in the Sun Server X4-2, and how to troubleshoot and maintain the system.

This document is intended for system administrators, network administrators, and service technicians who have an understanding of server systems.

This section describes how to get the latest software and firmware, documentation and feedback, and support and accessibility information.

- "Getting the Latest Software and Firmware" on page xi
- "About This Documentation" on page xii
- "Related Documentation" on page xii
- "Feedback" on page xii
- "Access to Oracle Support" on page xiii

Getting the Latest Software and Firmware

Firmware, drivers and other hardware-related software for each Oracle x86 server, server module (blade), and blade chassis are updated periodically.

You can obtain the latest software in one of three ways:

- Oracle System Assistant – This is a factory-installed option for Oracle x86 servers. It has all the tools and drivers you need and is built into the server.
- My Oracle Support: http://support.oracle.com
- Physical media request

For more information, see the *Sun Server X4-2 Installation Guide,* "Getting Server Firmware and Software Updates" on page 31.

About This Documentation

This documentation set is available in both PDF and HTML formats. The information is presented in topic-based organization (similar to online help) and therefore does not include chapters, appendices, or section numbering.

A PDF document that includes all information on a particular topic (such as hardware installation or product notes) can be generated by clicking the PDF button in the upper left corner of an HTML page.

Related Documentation

Documentation	Link
All Oracle documentation	http://www.oracle.com/documentation
Sun Server X4-2	http://www.oracle.com/goto/X4-2/docs
Oracle X4 Series Servers Administration Guide	http://www.oracle.com/goto/x86AdminDiag/docs
Oracle Integrated Lights Out Manager (ILOM) 3.1	http://www.oracle.com/goto/ILOM/docs
Oracle Hardware Management Pack 2.2	http://www.oracle.com/goto/OHMP/docs

Feedback

You can provide feedback on this documentation at:

http://www.oracle.com/goto/docfeedback

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

About the Sun Server X4-2

These sections describe the controls, connectors, status indicators, system components, and replaceable components of the server.

Description	Links
Review the product description.	"Product Description" on page 1
Learn about server controls and connectors.	"About Controls and Connectors" on page 2
Learn about server and component status indicators.	"About Server and Component Status Indicators" on page 6
Learn about system components.	"About System Components" on page 15

Product Description

The Sun Server X4-2 is an enterprise-class, one rack unit (1U) server. It supports the following components:

- Up to two Intel processors. Processors with the following capabilities are supported:
  - 2.7 GHz, 12-core, 130W
  - 3.0 GHz, 10-core, 130W
  - 2.6 GHz, 8-core, 95W
  - 2.6 GHz, 6-core, 80W
  - 2.5 GHz, 4-core, 80W
- Up to 8 DIMMs per processor for a maximum of 16 DDR3 DIMMs and a maximum of 512 GB of memory on dual-processor systems. DIMM sizes of 8 GB, 16 GB, and 32 GB are supported.

> **Note –** A maximum of eight DIMMs for a maximum of 256 GB are supported in single-processor systems.

- Four PCIe Gen3 slots in dual-processor systems: three external slots and one internal. PCIe slot 1, which is an external slot, is nonfunctional in single-processor systems.
- Storage drive configurations can include both hard disk drives (HDDs) or solid state drives (SSDs). Supported storage drive configurations include:
  - Eight 2.5-inch hot-pluggable SAS HDDs/SATA SSDs
  - Four 2.5-inch hot-pluggable SAS HDDs/SATA SSDs with DVD
- Two hot-pluggable, redundant power supplies.
- An on-board Oracle Integrated Lights Out Manager (Oracle ILOM) service processor (SP) based on the AST2300 chip.
- The Oracle System Assistant server setup tool, which is embedded on a preinstalled USB flash drive.

About Controls and Connectors

The following sections describe the controls, indicators, connectors, and drives located on the front and rear panels.

Related Information

Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives

The following figure shows the controls, status indicators (LEDs), connectors, and drives on the front panel of a Sun Server X4-2 configured with eight 2.5-inch storage drives.

FIGURE: Front Panel View of a Server With Eight 2.5-inch Drives
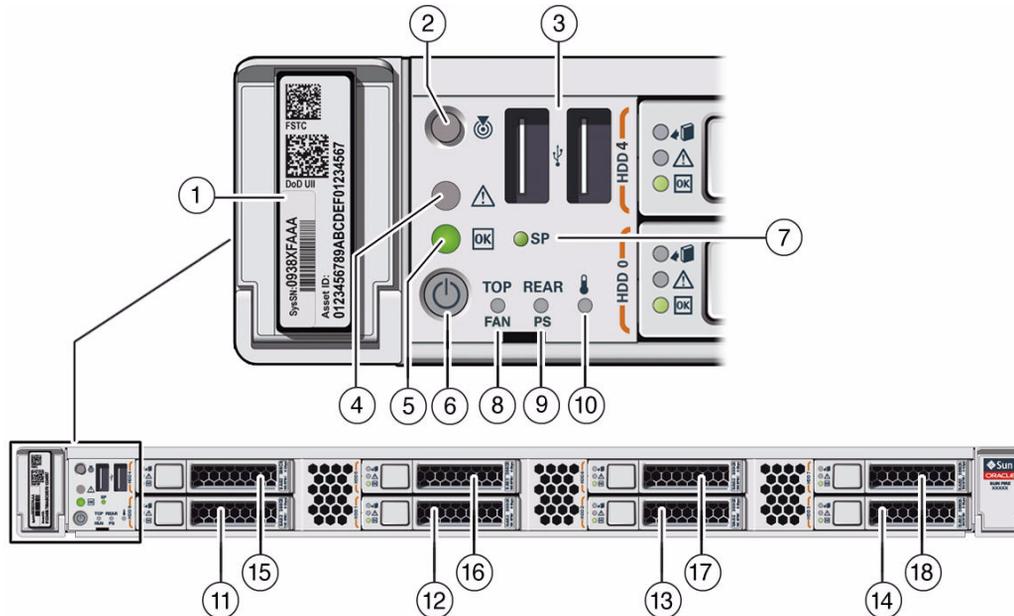
Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	**10**	System Over Temperature Warning LED: amber
2	Locator LED/Locator button: white	**11**	Storage drive 0
3	USB 2.0 connectors (2)	**12**	Storage drive 1
4	Service Required LED: amber	**13**	Storage drive 2
5	Power/OK LED: green	**14**	Storage drive 3
6	Power button	**15**	Storage drive 4
7	SP OK LED: green	**16**	Storage drive 5
8	Top Fan Fault LED: amber	**17**	Storage drive 6
9	Rear Power Supply (PS) Fault LED: amber	**18**	Storage drive 7 (In Oracle Engineered Systems, storage drive 7 might be populated with a remote battery module for the host bus adapter (HBA) card.)

Related Information

Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive

The following figure shows the controls, status indicators (LEDs), connectors, and drives on the front panel of a Sun Server X4-2 configured with four 2.5-inch storage drives and a SATA DVD drive.

FIGURE: Front Panel View of a Server With Four 2.5-inch Drives and SATA DVD Drive
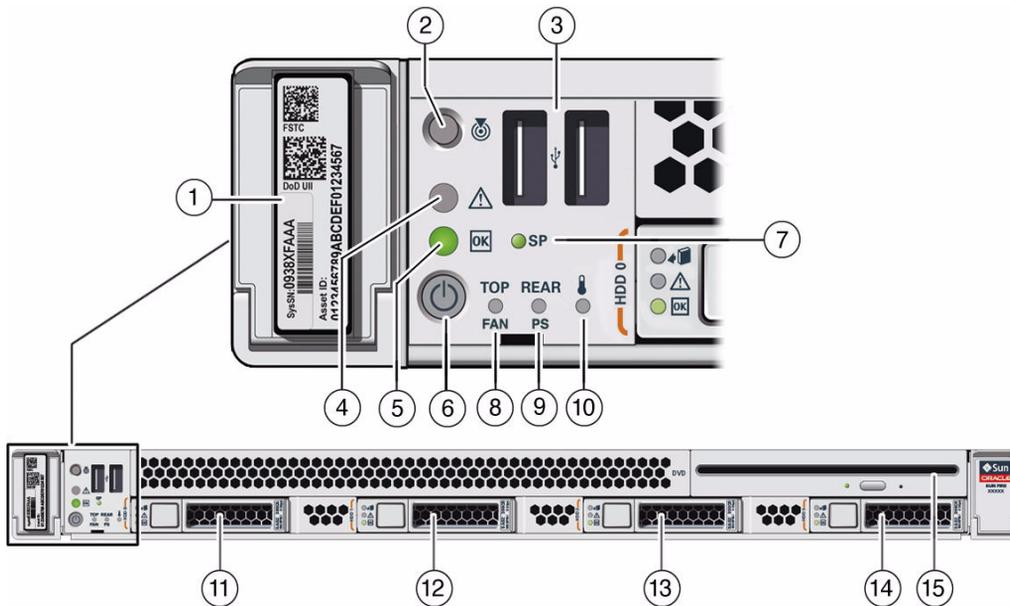
Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	9	Rear Power Supply Fault LED: amber
2	Locator LED/Locator button: white	10	System Over Temperature Warning LED: amber
3	USB 2.0 connectors (2)	11	Storage drive 0 (optional)
4	Service Required LED: amber	12	Storage drive 1
5	Power/OK LED: green	13	Storage drive 2

6	Power button	14	Storage drive 3
7	SP OK LED: green	15	SATA DVD drive
8	Top Fan Fault LED: amber	16	Not applicable

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Server Back Panel View" on page 5

Server Back Panel View

The following figure shows the Sun Server X4-2 back panel and the location of power supplies, status indicators (LEDs), connectors, and PCIe slots.

FIGURE: Server Back Panel View
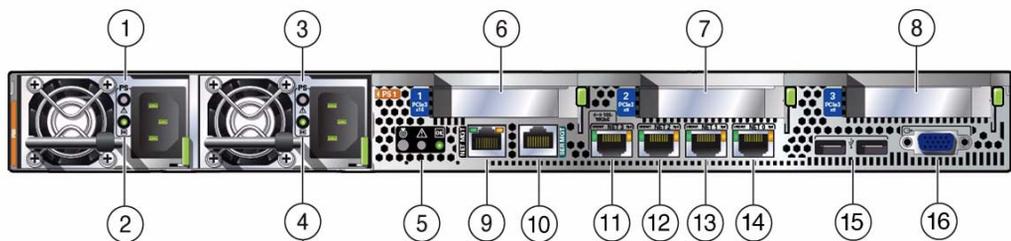
Figure Legend

1	Power Supply (PS) 0	9	Oracle Integrated Lights Out Manager (ILOM) service processor (SP) network management 10/100BASE-T port (NET MGT)
2	Power Supply (PS) 0 status indicators: Service Required LED: amber AC OK LED: green	10	Serial management (SER MGT)/RJ-45 serial port
3	Power Supply (PS) 1	11	Network (NET) 100/1000/10000 port: NET 3 (Nonfunctional in single-processor systems.)

4	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	12	Network (NET) 100/1000/10000 port: NET 2 (Nonfunctional in single-processor systems.)
5	System status indicators: Locator LED: white, Service Required LED: amber, Power/OK LED: green	13	Network (NET) 100/1000/10000 port: NET 1
6	PCIe card slot 1 (Nonfunctional in single-processor systems.)	14	Network (NET) 100/1000/10000 port: NET 0
7	PCIe card slot 2	15	USB 2.0 connectors (2)
8	PCIe card slots 3 and 4 (Slot 4 is the primary host bus adapter (HBA) card slot. This slot is internal and is not visible from the rear of the server. The server supports a maximum of one HBA card for controlling and managing the server storage drives.)	16	DB-15 video connector

Note – All of the PCIe slots comply with the PCI Express 3.0 specification and can accommodate 25 watt PCIe3 cards.

Related Information

About Server and Component Status Indicators

These sections describe the status indicators (LEDs) located on the front and rear of the server, including those found on components and ports.

Related Information

Server General Status Indicators

There are seven, system-level status indicators (LEDs), some of which are located on both the server front panel and the server back panel.

TABLE: Server General Status Indicators

Status Indicator Name	Icon/Label	Colors	State Meaning
Locator LED and button		White	• OFF – Server is operating normally. • FAST BLINK – Use Oracle ILOM to activate this LED to enable you to locate a particular system quickly and easily. • Pressing the Locate button will toggle the LED fast blink on or off.
Service Required		Amber	• OFF – The server is operating normally. • STEADY ON – A fault is present on server. This LED lights whenever a fault indicator lights for a replaceable component on the server. **Note -** The lighting of this indicator is always accompanied by a system console message that includes a recommended service action.
Power/OK	OK	Green	Indicates the operational state of the chassis. This indicator can be in the following states: • OFF – AC power is not present or the Oracle ILOM boot is not complete. • STEADY BLINK – Standby power is on, but the chassis power is off and the Oracle ILOM SP is running. • SLOW BLINK – Startup sequence has been initiated on the host. This pattern should begin soon after you power on the server. This status indicates either: (1) POST code checkpoint tests are running on the server host system, or (2) the host is transitioning from the powered-on state to the standby state on shutdown. • STEADY ON – The server is powered on, and all host POST code checkpoint tests are complete. The server is in one of the following states: 1) the server host is booting the operating system (OS), 2) the server host is running the OS.
SP OK	**SP**	Green	• OFF – Service processor (SP) is not running. • SLOW BLINK – SP is booting. • STEADY ON – SP is fully operational.

TABLE: Server General Status Indicators *(Continued)*

Status Indicator Name	Icon/Label	Colors	State Meaning
Top Fan	TOP FAN	Amber	Indicates that one (or more) of the internal fan modules has failed. • OFF – Indicates steady state; no service is required. • STEADY ON – Indicates service required; service the fan modules,
Rear Power Supply Fault	REAR PS	Amber	Indicates that one of the server power supplies has failed. • OFF – Indicates steady state; no service is required. • STEADY ON – Indicates service required; service the power supply.
System Over Temperature Warning		Amber	• OFF – Normal operation; no service is required. • STEADY ON – The system is experiencing an overtemperature warning condition. **Note -** This is a warning indication, not a fatal overtemperature. Failure to correct this might result in the system overheating and shutting down unexpectedly.

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5

Server Fan Status Indicators

Each fan module has one bicolored status indicator (LED). The LEDs are located on the chassis mid-wall adjacent to and aligned with the fan modules and are visible when the top cover fan door is open.

TABLE: Server Fan Status Indicators

Status Indicator Name	Icon	Color	State Meaning
Fan Status	None	Bicolored: Amber/Green	• Amber – The fan module is faulty. The front TOP FAN LED and the front and rear panel Service Required LEDs are also lit if the system detects a fan module fault. • Green – The fan module is correctly installed and operating within specification.

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Servicing Fan Modules (CRU)" on page 50

Storage Drive Status Indicators

There are three status indicators (LEDs) on each drive.

TABLE: Server Front Storage Drive Indicators

Status Indicator Name	Icon	Color	State Meaning
OK to Remove		Blue	• STEADY ON – The storage drive can be removed safely during a hot-plug operation. • OFF – The storage drive has not been prepared for removal.
Service Required		Amber	• OFF – The storage drive is operating normally. • STEADY ON – The system has detected a fault with the storage drive.
OK/Activity	OK	Green	• OFF – Power is off or the installed drive is not recognized by the system. • STEADY ON – The drive is engaged and is receiving power. • STEADY BLINK – There is disk activity. The LED blinks on and off to show activity.

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Servicing Storage Drives (CRU)" on page 45

Power Supply Status Indicators

There are two status indicators (LEDs) on each power supply. These indicators are visible from the rear of the server.

TABLE: Server Power Supply Indicators

Status Indicator Name	Icon	Color	State Meaning
AC OK/DC OK	OK	Green	• OFF – No AC power is present. • SLOW BLINK – Normal operation. Input power is within specification. DC output voltage is not enabled. • STEADY ON – Normal operation. Input AC power and DC output voltage are within specification.
Service Required	⚠	Amber	• OFF – Normal operation. No service action is required. • STEADY ON – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over or under voltage.

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Servicing Power Supplies (CRU)" on page 55

Network Management Port Status Indicators

The server has one 10/100BASE-T Ethernet management domain interface, labeled NET MGT. There are two status indicators (LEDs) on this port. These indicators are visible from the rear of the server.

TABLE: Network Management Port Status Indicators

Status Indicator Name	Location	Color	State and Meaning
Link speed	Top left	Bicolored: Amber/Green	• Amber ON – 10BASE-T link. • Green ON – 100BASE-T link. • OFF – No link or link down. • FLASHING – No function.
Activity	Top right	Green	• ON – No function. • OFF – No activity. • FLASHING – Packet activity.

Related Information

- "Network Management Port" on page 154
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Servicing Power Supplies (CRU)" on page 55

Ethernet Ports Status Indicators

The server has four Ethernet ports (NET 3, NET 2, NET 1, and NET 0). There are two status indicators on each port. These indicators are visible from the rear of the server.

Note – Ethernet ports NET 2 and NET 3 are nonfunctional in single-processor systems.

TABLE: Gigabit Ethernet Port Status Indicators

Status Indicator Name	Location	Color	State and Meaning
Activity	Top left	Green	• ON – No function. • OFF– No activity. • FLASHING – Packet activity.
Link speed	Top right	Bicolored: Amber/Green	• Amber ON— 100BASE-T link. • Green ON– 1000/10GBBASE-T link. • OFF – No link or link down. • FLASHING – No function.

Related Information

- "Gigabit Ethernet Ports" on page 153
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Servicing Power Supplies (CRU)" on page 55

Motherboard Status Indicators

The motherboard and modules that are installed on the motherboard contain several status indicators (LEDs), which are described in the following sections:

- "DDR3 DIMM Fault Status Indicators" on page 13
- "Processor Fault Status Indicators" on page 14
- "Fault Remind Status Indicator" on page 14
- "STBY PWRGD Status Indicator" on page 14

DDR3 DIMM Fault Status Indicators

Each of the 16 DDR3 DIMM sockets on the motherboard has an amber fault status indicator (LED) associated with it. If Oracle ILOM determines that a DIMM is faulty, pressing the Fault Remind button on the motherboard signals the service processor to light the fault LEDs associated with the faulted DIMMs.

Processor Fault Status Indicators

The motherboard includes a fault status indicator (LED) adjacent to each of the two processor sockets. These LEDs indicate when a processor is faulty. For example, if on reboot the BIOS detects that there are uncorrectable processor errors recorded in the machine check architecture (MCA) registers left over from the previous boot, then the BIOS and Oracle ILOM work together to record and diagnose these errors. If it is determined that a processor is faulty, pressing the Fault Remind button on the motherboard signals the service processor to light the fault LED associated with the faulted processor.

Fault Remind Status Indicator

This status indicator (LED) is located next to the Fault Remind button and is powered from the super capacitor that powers the fault LEDs on the motherboard. This LED lights to indicate that the fault remind circuitry is working properly in cases where no components have failed and, as a result, none of the component fault LEDs illuminate.

STBY PWRGD Status Indicator

The service instructions for all server internal components require that all AC power be removed from the power supplies prior to removing the server top cover. This green status indicator (LED) is labeled STBY PWRGD and is located on the rear of the server near PCIe slot 2.

Note – If a PCIe card is installed in PCIe slot 2, this LED might not be visible.

The STBY PWRGD LED lights to inform the service technician that the motherboard is receiving standby power from at least one of the power supplies. This LED is provided to help prevent service actions on the server internal components while the AC power cords are installed and power is being supplied to the server.

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 4
- "Server Back Panel View" on page 5
- "Illustrated Parts Breakdown" on page 15

About System Components

These sections describe the components of the server:

- "Illustrated Parts Breakdown" on page 15
- "Customer-Replaceable Units" on page 17
- "Field-Replaceable Units" on page 18
- "Battery Module" on page 19

Related Information

- "Servicing CRUs That Do Not Require Server Power-Off" on page 45
- "Servicing CRUs That Require Server Power-Off" on page 61
- "Servicing FRUs" on page 99

Illustrated Parts Breakdown

The following figure identifies the major components of the server.

FIGURE: Server Illustrated Parts Breakdown

Figure Legend

1	Server chassis for eight 2.5-inch storage drives	10	DIMMs **Note:** A maximum of eight DIMMs are supported in single-processor systems and the DIMMs must be installed in sockets associated with processor 0 (P0). No DIMM filler panels are required in vacant DIMM sockets associated with processors 0 (P0) or 1 (P1).
2	Server chassis for four 2.5-inch storage drives and DVD drive	11	Battery
3	SATA DVD drive	12	PCIe cards and the internal HBA card **Note:** PCIe slot 1 is nonfunctional in single-processor systems.

4	Four and eight 2.5-inch storage drive configurations (In Oracle Engineered Systems, storage drive 7 in eight-drive systems might be populated with a remote battery module for the HBA card.)	13	Top cover
5	Front indicator module for server with four or eight 2.5-inch storage drives	14	PCIe riser
6	Disk backplanes	15	USB flash drives
7	Fan modules	16	Processor heatsinks **Note:** In single-processor systems, neither a heatsink nor a processor socket filler are installed in the processor socket 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.
8	Chassis mid-wall	17	Motherboard
9	Processors **Note:** There is only one processor in single-processor systems and that processor is located in processor socket 0 (P0).	18	Power supplies

Customer-Replaceable Units

The following table lists the customer-replaceable units (CRUs) in the server and directs you to the replacement instructions.

CRU	Description	Replacement Instructions
Battery	Lithium coin-cell battery that powers the CMOS BIOS and real-time clock.	"Servicing the Battery (CRU)" on page 96
DIMMs	Add or replace memory in the system.	"Servicing the DIMMs (CRU)" on page 62
Storage drives	Supports SAS hard-disk drives (HDDs) or SATA solid-state drives (SSDs) and a DVD drive. • Four-drive configuration contains four 2.5-inch storage drives and a DVD drive • Eight-drive configuration contains eight 2.5-inch storage drives **Note -** In Oracle Engineered Systems, storage drive 7 in eight-drive systems might be populated with a remote battery module for the HBA card. The battery module is not a customer-replaceable unit.	"Servicing Storage Drives (CRU)" on page 45

CRU	Description	Replacement Instructions
DVD drive	DVD drive on configurations with four 2.5-inch storage drives.	"Servicing the DVD Drive (CRU)" on page 91
Fan modules	Contains four fan modules for cooling the motherboard assembly and installed components.	"Servicing Fan Modules (CRU)" on page 50
PCIe cards	Optional add-on cards that can expand the functionality of the server.	"Servicing PCIe Cards (CRU)" on page 84
PCIe risers	Houses and connects the PCIe cards.	"Servicing PCIe Risers (CRU)" on page 74
Power supplies	Two fully redundant AC power supplies.	"Servicing Power Supplies (CRU)" on page 55

Related Information

- "Field-Replaceable Units" on page 18
- "Illustrated Parts Breakdown" on page 15
- "Servicing CRUs That Do Not Require Server Power-Off" on page 45
- "Servicing CRUs That Require Server Power-Off" on page 61

Field-Replaceable Units

The following table lists the field-replaceable units (FRUs) in the server and directs you to the replacement instructions.

FRU	Description	Replacement Instructions
Processor	Carries out the instructions of the system.	"Servicing Processors (FRU)" on page 100
Disk backplane	Serves as the interface between storage drives and the host bus adapter (HBA) card.	"Servicing the Disk Backplane (FRU)" on page 117
Front indicator module (FIM)	Contains the front panel controls, indicators, and USB ports.	"Servicing the Front Indicator Module (FRU)" on page 125
Motherboard assembly	Provides connectors for the fans, DIMMs, processor(s), PCIe risers, and internal USB ports, and power supplies.	"Servicing the Motherboard (FRU)" on page 127
Internal HBA SAS controller cables	Serve to connect the disk backplane to the the internal host bus adapter (HBA) card.	"Servicing the SAS Cables (FRUs)" on page 138

Related Information

- "Customer-Replaceable Units" on page 17
- "Illustrated Parts Breakdown" on page 15
- "Servicing FRUs" on page 99

Battery Module

In Oracle Engineered Systems, storage drive 7 might be populated with a remote battery module for the host bus adapter (HBA) card.

⚠️ **Caution –** The battery module is not a customer-replaceable unit (CRU) and should not be removed or replaced by customers. The battery module should be removed or replaced only by Oracle field service personnel.

The battery module is hot-pluggable and provides the backup power subsystem for the Sun Storage 6 Gb SAS PCIe RAID Internal Host Bus Adapter (HBA): SG-SAS6-R-INT-Z. It enables Oracle field service personnel to replace the battery at the end of its service life without requiring the server to be powered off.

Related Information

- "Servicing Storage Drives (CRU)" on page 45

Troubleshooting the Server

These sections introduce the diagnostic tools and strategies available to help you diagnose problems with the system.

Description	Links
Review the tasks used to locate a specific problem with the system.	"Service Troubleshooting Task List" on page 21
Understand the diagnostic system indicators, utilities, and commands available.	"Diagnostic Tools" on page 22
Gather information about the system to help a service engineer or technician work on your system.	"Gather Service Information" on page 24
Locate the server serial number.	"Locate the Server Serial Number" on page 25
Inspect the system methodically to locate a faulty component or components.	"Inspecting the System" on page 25

Related Information

- "About the Sun Server X4-2" on page 1
- "Preparing for Service" on page 29
- "Returning the Server to Operation" on page 143

Service Troubleshooting Task List

Use the list in following table as a sequence for troubleshooting the server.

TABLE: Troubleshooting Task List

No.	Description	Section or Document
1	Gather initial service information.	"Gather Service Information" on page 24
2	Investigate power-on problems.	"Troubleshoot Power Problems" on page 26
3	Perform external visual inspection and internal visual inspection.	"Inspect the Server Externally" on page 26 "Inspect Internal Server Components" on page 26
4	View service processor logs and sensor information.	Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: `http://www.oracle.com/goto/ILOM/docs`
5	Run diagnostics.	*Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1* at: `http://www.oracle.com/goto/x86AdminDiag/docs`

Related Information

- "About the Sun Server X4-2" on page 1
- "Diagnostic Tools" on page 22

Diagnostic Tools

There are a variety of diagnostic tools, commands, and indicators you can use to monitor and troubleshoot the server:

- **LEDs** – These indicators provide a quick visual notification of the status of the server and of some of the CRUs and FRUs.
- **Oracle ILOM firmware** – This firmware is located on the service processor and provides a comprehensive service portal using a command-line interface (CLI) and browser user interface (BUI) for
  - lights-out management capabilities (such as remote power-on, power-off, etc.)
  - monitoring the health of the environmental subsystem (such as power, fans, temperature, cover interlock, etc.),
  - and fault management and automated diagnosis capabilities during server initialization (such as QuickPath Interconnect code and Memory Reference code) and server runtime

- **Pc-Check** – Accessed through Oracle ILOM, the DOS-based Pc-Check utility tests motherboard components such as processor, memory, and I/O, as well as ports and slots. If enabled through Oracle ILOM, this utility will run each time the system powers on. For information about Pc-Check, refer to the *Oracle X86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1* at `http://www.oracle.com/goto/x86AdminDiag/docs`.

- **SNMP**– Simple Network Management Protocol (SNMP) traps are generated by the SNMP agents that are installed on the SNMP devices being managed by Oracle ILOM. Oracle ILOM receives the SNMP traps and converts them into SNMP event messages that appear in the event log.

- **POST** – Power-on self-test (POST) performs diagnostics on system components upon system power-on and resets to ensure the integrity of those components. POST messages are displayed and logged in the BIOS event logs. POST works with Oracle ILOM to take faulty components offline, if needed.

- **Oracle Solaris OS Diagnostic Tools**
  - **Oracle Solaris OS Predictive Self-Healing (PSH)** – The PSH technology provides automated diagnosis of error events encountered with the processor, memory subsystem, and integrated I/O subsystem during runtime. The ability of PSH to off-line faulty processors and retire memory pages during runtime enhances system availability and prevents future interruptions. The Oracle Solaris OS PSH technology in conjunction with ILOM and BIOS provide extensive fault management architecture for placing processors offline and disabling DIMMs.

  - **Log files and console messages** – These items provide the standard Oracle Solaris OS log files and investigative commands that can be accessed and displayed on the device of your choice.

  - **Oracle VTS software** – This application exercises the system, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, Oracle ILOM, Oracle Solaris OS PSH, and many of the log files and console messages are integrated. For example, Oracle Solaris software will display a detected fault, log it, pass information to Oracle ILOM where it will be logged, and, depending on the fault, might cause one or more LEDs to light.

Related Information

- "About the Sun Server X4-2" on page 1
- Oracle Solaris OS documentation set at:
  - Oracle Solaris 10 1/13 information library at:
    `http://docs.oracle.com/cd/E26505_01/index.html`
  - Oracle Solaris 11.1 information library at:
    `http://docs.oracle.com/cd/E26502_01/index.html`

- Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
  http://www.oracle.com/goto/ILOM/docs
- *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1* at:

  http://www.oracle.com/goto/x86AdminDiag/docs
- Oracle VTS documentation set at:
  http://docs.oracle.com/cd/E19719-01/index.html

▼ Gather Service Information

The first step in determining the cause of a problem with the server is to gather information for the service call paperwork or the onsite personnel. Follow these general guidelines when you begin troubleshooting.

1. **Collect information about the following items:**
   - Events that occurred prior to the failure
   - Whether any hardware or software was modified or installed
   - Whether the server was recently installed or moved
   - How long the server exhibited symptoms
   - The duration or frequency of the problem

2. **Document the server settings before you make any changes.**

   If possible, make one change at a time in order to isolate potential problems. In this way, you can maintain a controlled environment and reduce the scope of troubleshooting.

3. **Note the results of any change that you make. Include any errors or informational messages.**

4. **Check for potential device conflicts before you add a new device.**

5. **Check for version dependencies, especially with third-party software.**

Related Information

▼ Locate the Server Serial Number

● **To locate the server serial number, do one of the following:**

■ From the front of the server, look at the left side of the front panel to locate the server serial number. The serial number is located on the Radio-frequency identification (RFID) tag on the front panel, next to the general status indicators. For illustrations of the server front panel, see "About Controls and Connectors" on page 2.

■ Refer to the service label that is attached to the top cover of the server. This label includes the serial number.

■ Locate the yellow Customer Information Sheet (CIS) attached to your server packaging. This sheet includes the serial number.

■ From the Oracle ILOM command-line interface (CLI), enter the `show /System` command or go to the System Information Summary page in the Oracle ILOM web browser interface.

Related Information

Inspecting the System

Controls that have been improperly set and cables that are loose or improperly connected are common causes of problems with hardware components. Follow these procedures to locate common problems with the system.

Related Information

▼ Troubleshoot Power Problems

1. **If the server is powered off, power on the server.**

   See "Power On the Server" on page 150.

   - If the server powers on, go to "Inspect the Server Externally" on page 26.
   - If the server does not power on, go to Step 2.

2. **Check that power cords are attached firmly to the server power supplies and to the power source.**

   Related Information
   - "Power On the Server" on page 150
   - "Inspect the Server Externally" on page 26
   - "Servicing Power Supplies (CRU)" on page 55

▼ Inspect the Server Externally

1. **Inspect the external status indicators (LEDs), which can indicate component malfunctions.**

   For the LED locations and descriptions of their behavior, see "About Server and Component Status Indicators" on page 6.

2. **Verify that nothing in the server environment is blocking airflow or making a contact that could short out power.**

3. **If the problem is not evident, continue with the next section,** "Inspect Internal Server Components" on page 26**.**

   Related Information
   - "About the Sun Server X4-2" on page 1
   - "Inspect Internal Server Components" on page 26

▼ Inspect Internal Server Components

1. **Power down the server from main power mode to standby power mode.**
   - Graceful power down – Notify users and gracefully power down the system.
   - Immediate power down – Power down the system quickly.

   See "Powering Down the Server" on page 33 for instructions.

2. **Disconnect the AC power cables from the server, extend the server to the maintenance position, and remove the server top cover.**

   See "Preparing the Server for Component Replacement" on page 33.

3. **Inspect the internal status indicators (LEDs), which can indicate component malfunction.**

   For the LED locations and descriptions of their behavior, see "Motherboard Status Indicators" on page 13.

   To light these LEDs, press and hold down the Fault Remind button, which is located on the motherboard. For more information on the Fault Remind button, see "Using the Fault Remind Button" on page 70.

4. **Verify that there are no loose or improperly seated components.**

5. **Verify that all cables inside the system are firmly and correctly attached to their appropriate connectors.**

6. **Verify that any components that you ordered separately and were not installed at the factory are qualified and supported.**

   Check with your customer representative for information about which PCIe cards and DIMMs are supported.

7. **Check that the installed DIMMs comply with the supported DIMM population rules and configurations.**

   For more information, see "DIMM Population Rules" on page 67.

8. **Return the server to operation.**

   See "Returning the Server to Operation" on page 143.

9. **Press and release the Power button on the server front panel.**

   When the main power is applied to the server, the Power/OK indicator next to the Power button blinks slowly until the OS is ready. When the OS is ready, the Power/OK indicator remains lit. For more information about the indicator, see "Server General Status Indicators" on page 7.

10. **If the problem with the server is not evident, then log in to either the Oracle ILOM Fault Management Shell or Oracle Solaris service portal and use the fault management command** `fmadm faulty` **to list any faults that might be present on the server.**

    For instructions, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at http://www.oracle.com/goto/ILOM/docs.

Related Information

- "Preparing for Service" on page 29
- "About Server and Component Status Indicators" on page 6

■ "Returning the Server to Operation" on page 143

Preparing for Service

These sections describe safety considerations and provide prerequisite procedures and information to replace components within the server.

Description	Links
Understand the safety precautions, understand the server FRU top-level indicator, understand the safety symbols, and take ESD precautions prior to removing or installing parts in the server.	"Safety Precautions" on page 29 "FRU TLI Auto-Update" on page 30 "Safety Symbols" on page 30 "Electrostatic Discharge Safety" on page 31
Assemble the required tools.	"Required Tools" on page 32
Before working with components within the server, power down the server and prepare for servicing.	"Preparing the Server for Component Replacement" on page 33

Related Information

- "Returning the Server to Operation" on page 143

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the online *Sun Server X4-2 Safety and Compliance Guide* and in the printed *Important Safety Information for Oracle's Hardware Systems*.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Follow the electrostatic discharge safety practices as described in "Electrostatic Discharge Safety" on page 31.

- Disconnect both power supply cords before servicing components.

Related Information

- "Safety Symbols" on page 30
- "Electrostatic Discharge Safety" on page 31

FRU TLI Auto-Update

Oracle ILOM includes a top-level indicator (TLI) auto-update feature that ensures that the TLI stored in the server field-replaceable units (FRUs) is always correct. The TLI, which is unique to each server, is used to track the server service entitlement and warranty coverage. When a server requires service, the server TLI is used to verify that the warranty on the server has not expired.

The TLI is stored in the FRUID (field-replaceable unit identifiers) of these components: power supply 0 (PSU 0), motherboard (MB), and disk backplane (DBP).

The TLI components stored in each component FRUID include:

- Product name
- PPN (product part number)
- PSN (product serial number)

When a server FRU that contains the TLI is removed and a replacement module installed, the TLI of the replacement module is programmed by Oracle ILOM to contain the same TLI as the other two modules.

Safety Symbols

The following symbols might appear in this book. Note their meanings.

Caution – There is a risk of personal injury or equipment damage. To avoid personal injury or equipment damage, follow the instructions.

Caution – The surface of the component is hot. Avoid contact. Surfaces are hot and might cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Related Information

- "Safety Precautions" on page 29
- "Electrostatic Discharge Safety" on page 31

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as the motherboard, PCIe cards, drives, processors, and memory cards require special handling.

Caution – The boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy components. Do not touch the components along their connector edges.

Do the following when handling ESD-sensitive components:

- Use an antistatic wrist strap.

  Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, boards, or cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Then disconnect the power cords from the server. Following this practice equalizes the electrical potentials between you and the server.

Note – An antistatic wrist strap is not included in the Ship Kit for the server. However, antistatic wrist straps are included with options and components.

- Use an antistatic mat.

Place ESD-sensitive components such as the motherboard, memory DIMMs, and other printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

- An antistatic bag used to wrap an Oracle replacement part
- An Oracle ESD mat (orderable item)
- A disposable ESD mat (shipped with some replacement parts or optional system components)

Related Information

Required Tools

The server can be serviced with the following tools:

- Antistatic wrist strap
- Antistatic mat
- No. 2 Phillips screwdriver

Related Information

Preparing the Server for Component Replacement

Before you can remove and install components that are inside the server, you must perform the procedures in the following tasks:

Note – When replacing the storage drives or power supplies, not all of these procedures are necessary. See the replacement tasks for those components for more information.

- "Powering Down the Server" on page 33
- "Disconnect Cables From the Server" on page 39
- "Extend the Server to the Maintenance Position" on page 39
- "Remove the Server From the Rack" on page 41
- "Take Antistatic Measures" on page 42
- "Remove the Server Top Cover" on page 43

Related Information

- "Returning the Server to Operation" on page 143

Powering Down the Server

To determine how you want to power off the server, view the options in the following table:

Description	Link
Power down the server gracefully to save all data and to prevent data from being corrupted. Performing a graceful shutdown ensures that the system is ready for restart.	• "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 34 • "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 35 • "Power Down Server Gracefully Using the Power Button" on page 36

Description	Link
If the server is not responding, or you must shut down the server quickly, perform an immediate shutdown.	• "Use the Power Button for Immediate Shutdown" on page 36 • "Use the Oracle ILOM CLI for Immediate Shutdown" on page 37 • "Use the Oracle ILOM Web Interface for Immediate Shutdown" on page 38

Related Information

■ "Power On the Server" on page 150

▼ Power Down Server Gracefully Using the Oracle ILOM CLI

Performing a graceful shut down ensures that all of your data is saved and the system is ready for restart.

1. Log in to the server as superuser or equivalent.

Depending on the nature of the problem, you might want to view the system status or the log files or run diagnostics before you shut down the system. For more information, see the Oracle ILOM 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`

2. Notify affected users that the server will be powered down.

3. Save any open files, and quit all running applications.

Refer to your application documentation for specific information on these processes.

4. Log in to the Oracle ILOM command-line interface (CLI) using an Administrator account.

For instructions, see the *Sun Server X4-2 Installation Guide,* "Log In to Oracle ILOM Remotely Using the CLI" on page 91.

5. At the Oracle ILOM prompt, shut down the operating system:

```
-> stop /System
```

If the system is running the Oracle Solaris OS, refer to the Oracle Solaris system administration documentation for additional information.

6. Disconnect the power cords and data cables from the server.

See "Disconnect Cables From the Server" on page 39.

Related Information

- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 35
- "Power Down Server Gracefully Using the Power Button" on page 36
- "Use the Power Button for Immediate Shutdown" on page 36
- "Power On the Server" on page 150

▼ Power Down Server Gracefully Using the Oracle ILOM Web Interface

1. Log in to the server as superuser or equivalent.

Depending on the nature of the problem, you might want to view the system status or the log files or run diagnostics before you shut down the system. For more information, see the Oracle ILOM 3.1 Documentation Library at http://www.oracle.com/goto/ILOM/docs.

2. Notify affected users that the server will be powered down.

3. Save any open files and quit all running applications.

Refer to your application documentation for specific information about these processes.

4. Log in to the Oracle ILOM web interface using an Administrator account.

For instructions, see the *Sun Server X4-2 Installation Guide,* "Log In to Oracle ILOM Remotely Using the Web Interface" on page 89.

The Oracle ILOM web interface System Information > Summary page appears.

5. In the left pane, click Host Management > Power Control, and select Graceful Shutdown and Power Off from the Action list.

6. Click Save and then click OK.

The host server performs an orderly power shutdown.

7. Disconnect the power cords an data cables from the server.

See "Disconnect Cables From the Server" on page 39.

Related Information

- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 34
- "Power Down Server Gracefully Using the Power Button" on page 36
- "Use the Power Button for Immediate Shutdown" on page 36
- "Power On the Server" on page 150

▼ Power Down Server Gracefully Using the Power Button

Note – You can use the Power button on the front of the server to power down the server gracefully.

1. **Press and quickly release the Power button on the front panel.**

   This action causes ACPI-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to standby power mode immediately.

   When main power is off, the Power/OK LED on the front panel will begin flashing, indicating that the server is in standby power mode. See "Server General Status Indicators" on page 7.

2. **Disconnect the power cords and data cables from the server.**

   See "Disconnect Cables From the Server" on page 39.

Caution – When you press the Power button to enter standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the power supplies.

Related Information

- "About Controls and Connectors" on page 2
- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 34
- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 35
- "Use the Power Button for Immediate Shutdown" on page 36
- "Power On the Server" on page 150

▼ Use the Power Button for Immediate Shutdown

Caution – You might corrupt your system data during an immediate power down, so only use this procedure to power down the server after attempting the graceful power down procedure.

1. **Press and hold the Power button for four seconds to force the main power off and to enter standby power mode.**

   When main power is off, the Power/OK LED on the front panel will begin flashing, indicating that the server is in standby power mode. See "Server General Status Indicators" on page 7.

2. **Disconnect the power and data cables from the server.**

   See "Disconnect Cables From the Server" on page 39.

Caution – When you press the Power button to enter standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the power supplies.

Related Information

- "About Controls and Connectors" on page 2
- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 34
- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 35
- "Power Down Server Gracefully Using the Power Button" on page 36
- "Power On the Server" on page 150
- "Use the Oracle ILOM CLI for Immediate Shutdown" on page 37
- "Use the Oracle ILOM Web Interface for Immediate Shutdown" on page 38

▼ Use the Oracle ILOM CLI for Immediate Shutdown

Caution – You might corrupt your system data during an immediate power down, so only use this procedure to power down the server after attempting the graceful power down procedure.

1. **Log in to the Oracle ILOM command-line interface (CLI) using an Administrator account.**

   Oracle ILOM displays the default command prompt (->), indicating that you have successfully logged in to Oracle ILOM.

2. **From the CLI prompt, type the following command:**

   `-> stop -f /System`

   The server powers down immediately.

3. Disconnect the power and data cables from the server.

See "Disconnect Cables From the Server" on page 39.

⚠ **Caution –** When the server is powered down, it enters standby power mode. In standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the power supplies.

Related Information

▼ Use the Oracle ILOM Web Interface for Immediate Shutdown

⚠ **Caution –** You might corrupt your system data during an immediate power down, so only use this procedure to power down the server after attempting the graceful power down procedure.

1. Log in to the Oracle ILOM web interface using an Administrator account.

The Oracle ILOM web interface System Information page appears.

2. In the left pane, click Host Management > Power Control, and select Immediate Power Off in the Actions list.

3. Click Save, and then click OK.

The server powers down immediately.

4. Disconnect the power and data cables from the server.

See "Disconnect Cables From the Server" on page 39.

⚠ **Caution –** When the server is powered down, it enters standby power mode. In standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the power supplies.

Related Information

▼ Disconnect Cables From the Server

⚠ **Caution –** The system supplies standby power to the circuit boards when the power cords are connected even when the system is powered off.

1. Label all cables connected to the server.

2. Disconnect the power cords from the rear of the server.

3. Disconnect all data cables from the rear of the server.

Related Information

- "Server Back Panel View" on page 5
- "Powering Down the Server" on page 33
- "Remove the Server From the Rack" on page 41
- "Reconnect Data Cables and Power Cords" on page 149

▼ Extend the Server to the Maintenance Position

The following components can be serviced with the server in the maintenance position:

- Storage drives
- Fan modules
- Power supplies
- DVD drive module
- PCIe risers
- PCIe cards
- DDR3 DIMMs
- Internal USB flash drives
- Motherboard battery
- Processors
- Disk backplane
- FIM (front indicator module)
- Motherboard
- SAS cables

If the server is installed in a rack with extendable slide-rails, use this procedure to extend the server to the maintenance position.

1. **To prevent the rack from tipping forward when the server is extended, extend all rack anti-tilt devices.**

⚠ Caution – To reduce the risk of personal injury, stabilize the expansion rack cabinet and extend all anti-tilt devices before extending the server from the rack.

For instructions for stabilizing the rack, see the *Sun Server X4-2 Installation Guide,* "Stabilize the Rack for Installation" on page 43.

2. **Verify that no cables will be damaged or will interfere when the server is extended.**

Although the cable management arm (CMA) that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.

3. **To release the slide-rails locks, pull down on the flip-down handles, which are located on the sides of the server front panel (see** FIGURE: Slide-Rail Release Latches on page 41 **[callout 1]).**

Note – The slide-rail locks are located behind the flip-down handles on the front of the server. The slide-rail locks are released when the flip-down handles are pulled down.

The server is now in the extended maintenance position.

FIGURE: Slide-Rail Release Latches
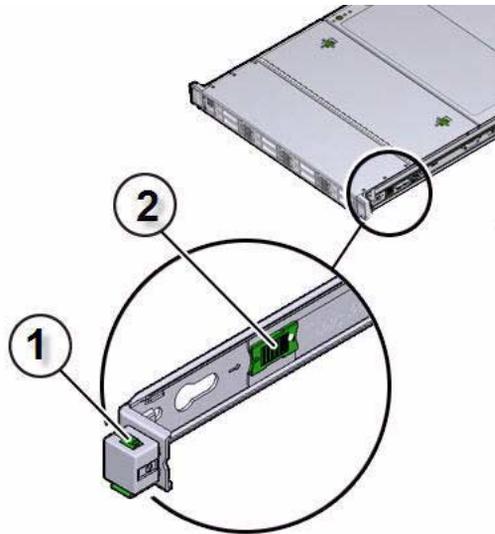
Figure Legend

1	Slide-rail lock
2	Slide-rail release tab

4. Slowly pull the server out of the rack until the slide-rails latch.

Related Information

- "Disconnect Cables From the Server" on page 39
- "Remove the Server From the Rack" on page 41
- "Reinstall the Server Chassis Into the Rack" on page 146

▼ Remove the Server From the Rack

⚠ **Caution –** The server weighs approximately 18.0 kg (40.0 lbs). Two people are required to dismount and carry the chassis.

1. Disconnect all the cables and power cords from the server.

2. Remove the cable management arm (CMA).

- For instructions for removing the second-generation CMA, see the *Sun Server X4-2 Installation Guide,* "Remove the Second-Generation Cable Management Arm" on page 64.

- For instructions for removing the first-generation CMA, see the *Sun Server X4-2 Installation Guide,* "Install the First-Generation Cable Management Arm" on page 69 and perform the installation steps in reverse order.

3. **Extend the server to the maintenance position.**

   For instructions, see "Extend the Server to the Maintenance Position" on page 39.

4. **From the front of the server, pull the green slide-rail release tabs toward the front of the server, and pull the server out of the rack until it is free of the rack rails.**

   A slide-rail release tab is located on each slide-rail (see FIGURE: Slide-Rail Release Latches on page 41 [callout 2]).

Note – To pull the green slide-rail release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.

---

5. **Set the server on a sturdy work surface.**

Related Information

- "Disconnect Cables From the Server" on page 39
- "Take Antistatic Measures" on page 42
- "Extend the Server to the Maintenance Position" on page 39
- "Reinstall the Server Chassis Into the Rack" on page 146

▼ Take Antistatic Measures

1. **Prepare an antistatic surface on which to set parts during removal and installation.**

   Place electrostatic discharge (ESD)-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

   - An antistatic bag used to wrap a replacement part
   - An Oracle ESD mat (orderable item)
   - A disposable ESD mat (shipped with some replacement parts or optional system components)

2. **Attach an antistatic wrist strap.**

   When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Then disconnect the power cords from the server.

Note – An antistatic wrist strap is not included in the Ship Kit for the server. However, antistatic wrist straps are still included with options and components.

Related Information

■ "Remove Antistatic Measures" on page 146

▼ Open the Server Fan Door

Servicing the server fan modules and other components located in the front of the server, such as the front indication module, the DVD drive, and disk backplanes, requires that the fan door be opened. It is also easier to remove the server top cover if you open the fan door first.

● **To open the server fan door, slide the fan door latches to the front of the server and swing the door up to the open position.**

FIGURE: Opening the Server Fan Door
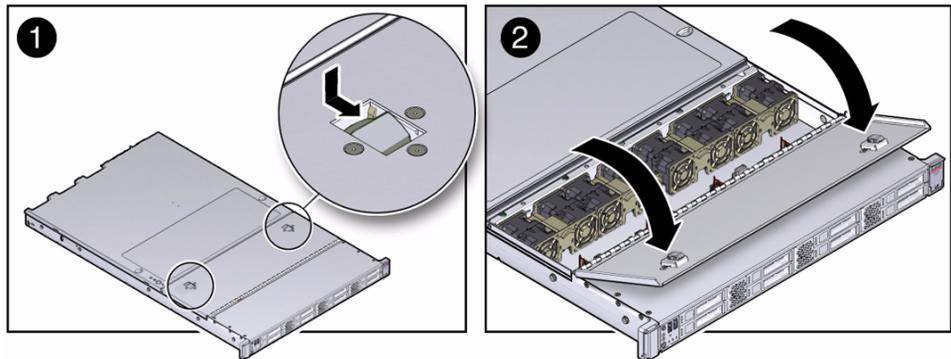
Related Information

■ "Take Antistatic Measures" on page 42
■ "Remove the Server Top Cover" on page 43

▼ Remove the Server Top Cover

Servicing most of the server components requires that the top cover be removed.

Caution – If the top cover is removed without first removing the AC power cords, the server host shuts down immediately and an event is logged to indicate that the chassis top cover has been removed.

1. **Ensure that the AC power cords are disconnected from the server power supplies.**

2. **To open the server fan door, slide the fan door latches toward the front of the server and swing the door up to the open position.**

3. **To open the server top cover, press and hold down the top cover release buttons and use the recessed areas to slide the top cover toward the rear of the server about 0.5 inches (12.7 mm) [1].**

FIGURE: Removing the Server Top Cover
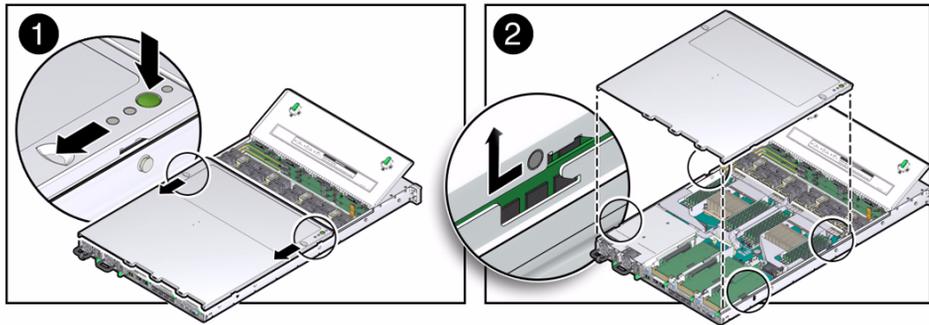
4. **Lift the cover off the chassis and set it aside [2].**

Related Information
- "Take Antistatic Measures" on page 42
- "Install the Server Top Cover" on page 145

Servicing CRUs That Do Not Require Server Power-Off

The following sections describe how to service customer-replaceable units (CRUs) that do not require you to power off the server.

Description	Links
Service the storage drives.	"Servicing Storage Drives (CRU)" on page 45
Service the fan modules.	"Servicing Fan Modules (CRU)" on page 50
Service the power supplies.	"Servicing Power Supplies (CRU)" on page 55

Related Information

- "Servicing CRUs That Require Server Power-Off" on page 61
- "Servicing FRUs" on page 99

Servicing Storage Drives (CRU)

These sections describe how to remove and install storage drives:

In addition to the service procedures included here, you can see animations that show how to remove and install the storage drives.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

See the following procedures:

Related Information

Storage Drives Hot-Plug Conditions

The solid-state drives (SSDs) or hard-disk drives (HDDs) in the server are hot-pluggable, but this capability depends on how the drives are configured. To hot-plug a drive you must be able to take the drive offline before you can remove it. When you take the drive offline, you prevent any application from accessing the drive and remove the logical software links to the drive.

The following situations inhibit the ability to perform hot-plugging of a drive:

- The drive provides the operating system, and the operating system is not mirrored on another drive.
- The drive cannot be logically isolated from the online operations of the server.

If either of the above drive restrictions is true, then you must shut down the system before you replace the drive. See "Powering Down the Server" on page 33.

Note – Replacing a drive does not require removing the server from a rack.

Related Information

HDD or SSD Failure and RAID

A single storage drive failure does not cause a data failure if the storage drives are configured as a mirrored RAID 1 volume (optional). The storage drive can be removed, and when a new storage drive 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 storage drive is automatically configured as a new hot-spare.

For instructions for configuring RAID on the server, refer to the *Sun Server X4-2 Installation Guide,* "Configuring Server Drives for OS Installation" on page 113.

Storage Drive Status Indicators

The following figure and table describe the storage drive status indicators (LEDs).

FIGURE: Storage Drive Status Indicators
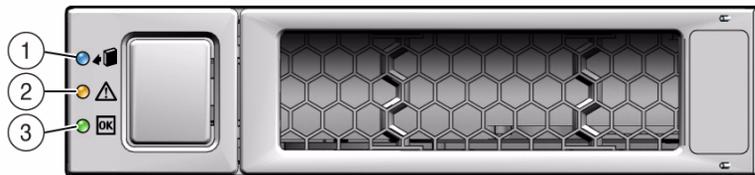
TABLE: Storage Drive Status Indicators

Legend	LED	Color	State Meaning
1	OK to Remove	Blue	• STEADY ON – The storage drive can be removed safely during a hot-plug operation. • OFF – The storage drive has not been prepared for removal.
2	Service Required	Amber	• OFF – The storage drive is operating normally. • STEADY ON – The system has detected a fault with the storage drive.
3	OK/Activity	Green	• OFF – Power is off or the installed drive is not recognized by the system. • STEADY ON – The drive is engaged and is receiving power. • STEADY BLINK – There is disk activity. The LED blinks on and off to show activity.

▼ Remove a Storage Drive

1. **Prepare the system for the drive removal.**

   See "Take Antistatic Measures" on page 42.

2. **Identify the location of the drive that you want to remove.**

   The following illustrations show the location of the drives and the internal system software designations for the drives.

   FIGURE: Drive Location and Numbering on a Server With Four 2.5-inch Drives and a DVD Drive

			DVD
HDD0	HDD1	HDD2	HDD3

   FIGURE: Drive Location and Numbering on a Server With Eight 2.5-inch Drives

HDD4	HDD5	HDD6	HDD7
HDD0	HDD1	HDD2	HDD3

Caution – In Oracle Engineered Systems, storage drive 7 (HDD7) on an eight-drive system might be populated with a remote battery module for the host bus adapter (HBA). The battery module is not a customer-replaceable unit (CRU) and should not be removed or replaced by customers. The battery module should be removed or replaced only by Oracle field service personnel. For more information, refer to "Battery Module" on page 19.

3. **Type the operating system commands required to stop the server from using the drive.**

Note – The blue OK to Remove LED on the storage drive might not light, as support for this varies depending on the operating system in use.

   The exact commands required depend on the configuration of your drives. Unmount file systems or issue RAID commands as needed.

4. **On the drive you plan to remove, push the latch release button to open the drive latch.**

FIGURE: Locating the Hard Disk Drive Release Button and Latch
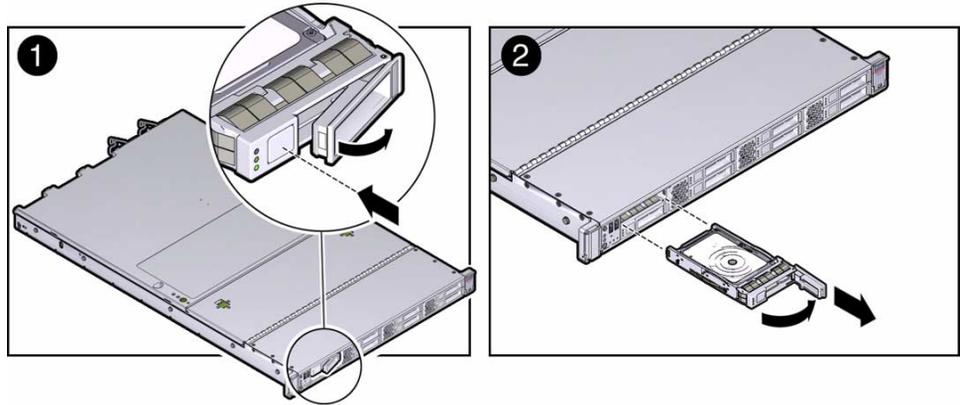
![Caution symbol] **Caution –** The latch is not an ejector. Do not open the latch too far to the right. Doing so can damage the latch.

5. **Grasp the latch and pull the drive out of the drive slot.**

6. **Consider your next steps:**
   - If you are replacing the drive, continue to "Install a Storage Drive" on page 49.
   - If you are not replacing the drive, install a filler panel in the empty drive slot to maintain proper airflow and perform administrative tasks to configure the server to operate without the drive.

Related Information
- "Storage Drive Status Indicators" on page 47
- "Storage Drives Hot-Plug Conditions" on page 46
- "HDD or SSD Failure and RAID" on page 46
- "Install a Storage Drive" on page 49

▼ Install a Storage Drive

1. **Remove the replacement drive from its packaging and place the drive on an antistatic mat.**

2. **If necessary, remove the drive filler panel.**

3. **Align the replacement drive with the drive slot.**

   The drive is physically addressed according to the slot in which it is installed. It is important to install a replacement drive in the same slot as the drive that was removed.

4. **Slide the drive into the slot until the drive is fully seated [1].**
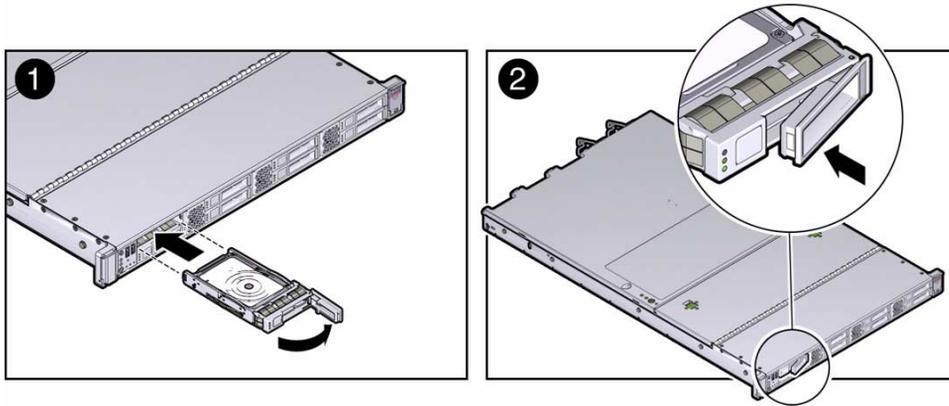
5. **Close the drive latch to lock the drive in place [2].**

6. **Perform administrative tasks to reconfigure the drive.**

   The procedures that you perform at this point depend on how your data is configured. You might need to partition the drive, create file systems, load data from backups, or have the drive updated from a RAID configuration.

Related Information

- "Storage Drive Status Indicators" on page 47
- "Storage Drives Hot-Plug Conditions" on page 46
- "HDD or SSD Failure and RAID" on page 46
- "Remove a Storage Drive" on page 47

Servicing Fan Modules (CRU)

The fan modules are located in the front of the server.

In addition to the service procedures included here, you can see animations that show how to remove and install the fans.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

See the following procedures:

■ "Remove a Fan Module" on page 51
■ "Install a Fan Module" on page 54

Related Information

■ "Open the Server Fan Door" on page 43

▼ Remove a Fan Module

You do not have to power off the server to service the fan modules.

You should not begin this procedure unless you have a replacement fan and you are ready to install it right away.

1. Extend the server to the maintenance position.

See "Extend the Server to the Maintenance Position" on page 39.

2. To access the fan modules, open the server fan door.

See "Open the Server Fan Door" on page 43.

Caution – Close the server fan door within 60 seconds to maintain adequate airflow to properly cool the server. Leaving the door open for more than 60 seconds, while the server is running, might cause the server to overheat and shut down.

3. Identify the faulty fan module.

Each fan module has a status indicator (LED). If the LED is lit amber, the fan has failed. The LEDs are located on the chassis mid-wall adjacent to and aligned with the fan modules, as shown in the following figure:

FIGURE: Server Fan Status Indicator
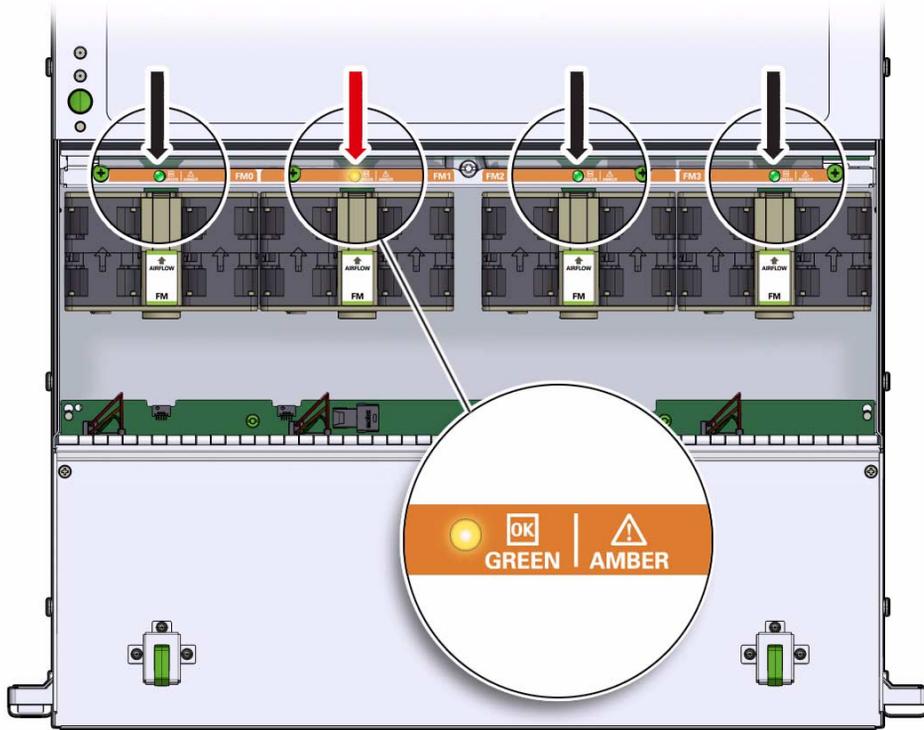
Status Indicator Name	Color	State Meaning
Fan Status	Bicolored: Amber/Green	• Amber – The fan module is faulty. The front TOP FAN LED and the front and rear panel Service Required LEDs are also lit if the system detects a fan module fault. • Green – The fan module is correctly installed and operating within specification.

4. **Remove the faulty fan module.**

   a. **Using your thumb and forefinger, grasp the fan module in the finger recesses located in the plastic between the fans.**

   b. **Lift the fan module straight up and out of the chassis.**

Caution – When removing a fan module, do not rock it back and forth. Rocking the fans module can cause damage to the motherboard connectors.

FIGURE: Removing a Fan Module
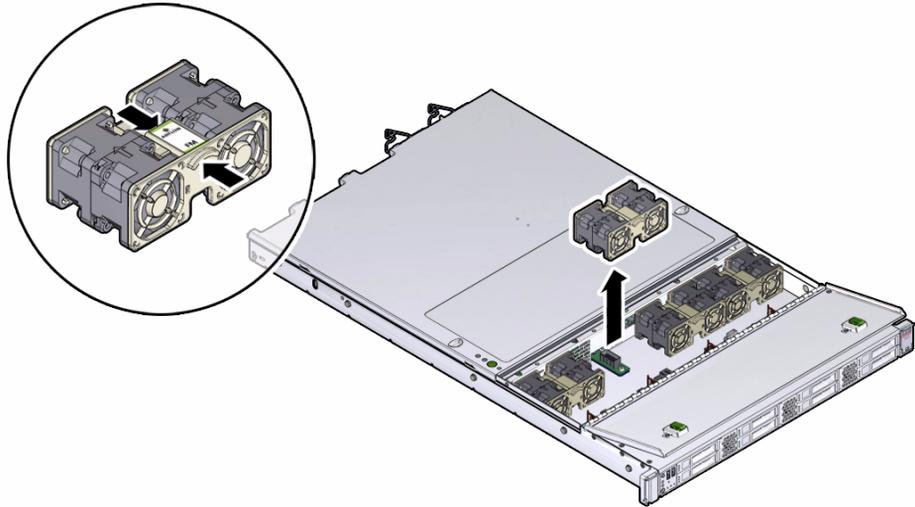
5. **Set the fan module aside.**

Caution – Do not service any other components in the fan compartment unless the system is shut down and the power cords are removed.

6. **Consider your next step:**

   - If you removed the fan assembly as part of another procedure, return to that procedure.
   - Otherwise, continue to "Install a Fan Module" on page 54.

Related Information

- "Install a Fan Module" on page 54

▼ Install a Fan Module

1. **Remove the replacement fan module from its packaging and place it on an antistatic mat.**

2. **With the fan door open, position the replacement fan module into the server.**

   The fan modules are keyed to ensure that they are installed in the correct orientation.

FIGURE: Installing a Fan Module
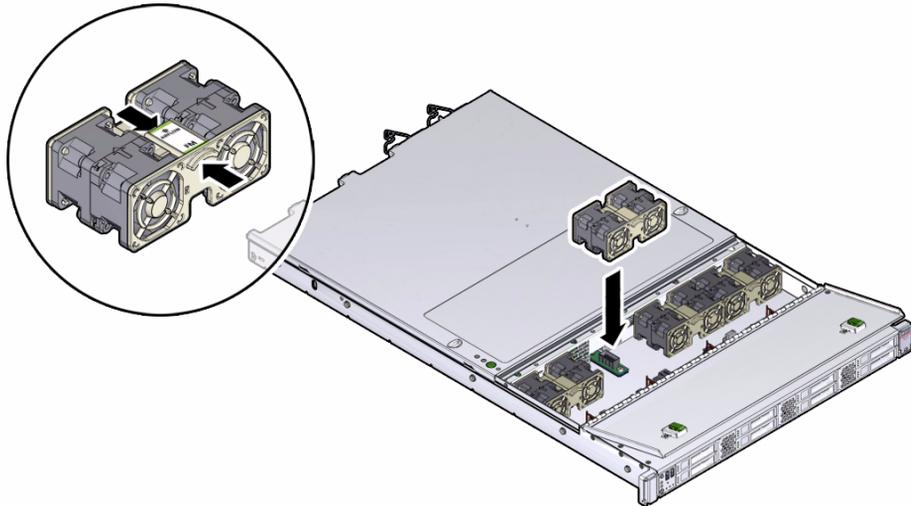
3. **Press down on the fan module and apply firm pressure to fully seat the fan module.**

4. **Verify that the fan status LED that aligns with the replaced fan module is lit green.**

5. **Close the fan door.**

6. **Verify that the Top Fan Fault LED on the front of the server and the Service Required LEDs on the front and rear of the server are extinguished.**

   See "About Server and Component Status Indicators" on page 6 for more information about identifying and interpreting system indicators.

7. **Consider your next step:**

   - If you installed the fan module as part of another procedure, return to that procedure.

- Otherwise, return the server to operation.

  See "Returning the Server to Operation" on page 143.

Related Information

- "Remove a Fan Module" on page 51

Servicing Power Supplies (CRU)

The redundant power supplies on the server support concurrent maintenance, which enables you to remove and replace a power supply without shutting down the server, provided that the other power supply is online and working.

The server supports model A256 (600 watt) power supplies. The A256 power supply unit (PSU) provides conversion from the AC lines to the system, accepting ranges from 100-240 volts AC (VAC). These PSUs are designed to be hot-swappable, and in most cases will provide fully redundant "1+1" power, allowing the system to suffer the loss of a PSU or an AC feed with no loss to system availability.

In maximally configured systems, it is possible that the worst-case power consumption of the system could exceed the capacity of a single PSU. The PSUs provide an over-subscription mode, which allows the system to operate with fault-tolerance even with modest excursions beyond the rated capacity of a single PSU. This over-subscription support is accomplished using hardware signaling between the PSU and motherboard circuitry, which can force the system to throttle maximally CPU and memory power in the event that a PSU is lost. The resulting power savings will be enough to allow the system to continue to run (in a lower-performance state) until the power problem is resolved.

The following indicators are lit when a power supply fault is detected:

- Front and rear Service Required LEDs
- Amber Service Required LED on the faulty power supply
- Rear Power Supply Fault LED located on the server front panel (see "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 3)

If a power supply fails and you do not have a replacement available, leave the failed power supply installed to ensure proper airflow in the server.

In addition to the service procedures included here, you can see animations that show how to remove and install the power supplies.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

See the following sections for more information:

- "Power Supply Status Indicators" on page 56
- "Remove a Power Supply" on page 57
- "Install a Power Supply" on page 59

Related Information

- "About Server and Component Status Indicators" on page 6
- "Powering Down the Server" on page 33

Power Supply Status Indicators

Each power supply contains two status indicators (LEDs) on the back panel. The following figure and table provide a description of the power supply status indicators.

FIGURE: Power Supply Status Indicators
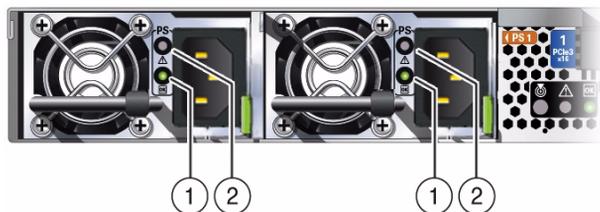
TABLE: Server Power Supply Indicators

Legend	Status Indicator Name	Icon	Color	State Meaning
1	AC OK/DC OK	OK	Green	• OFF – No AC power is present. • SLOW BLINK – Normal operating. Input power is within specification. DC output voltage is not enabled. • STEADY ON – Normal operation. Input AC power and DC output voltage are within specification.
2	Service Required	⚠	Amber	• OFF – Normal operation; no service required. • STEADY ON – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over/under voltage.

▼ Remove a Power Supply

1. **Identify which power supply requires replacement.**

   A lit amber Service Required LED on a power supply indicates that a failure was detected. You can also use the Oracle ILOM `show faulty` command at the Oracle ILOM prompt (->) to identify a power supply failure.

   Alternatively, to list all known faults in the server, log into the Oracle Solaris OS and issue the fmadm faulty command, or log into the Oracle ILOM service processor from the Oracle ILOM Fault Management Shell and issue the fmadm faulty command.

   Note – The fans of a failed power supply might still be spinning when the system is powered on. You can remove a power supply while the fans are still spinning.

2. **Gain access to the rear of the server where the faulty power supply is located.**

3. **If the cable management arm (CMA) is installed, disconnect both CMA left-side connectors and move the CMA out of the way.**

   For instructions for disconnecting the CMA left-side connectors, see the *Sun Server X4-2 Installation Guide,* "Remove the Second-Generation Cable Management Arm" on page 64 or *Sun Server X4-2 Installation Guide,* "Install the First-Generation Cable Management Arm" on page 69 as applicable.

⚠️ **Caution –** When disconnecting the CMA left-side connectors, be sure to use your arm to support the CMA so that it does not hang down under its own weight and stress the right-side connectors; otherwise, the CMA might be damaged. You must continue to support the CMA until you have reconnected both of the left-side connectors.

4. Disconnect the power cord from the faulty power supply.

5. Grasp the power supply handle and push the power supply latch to the left [1].

FIGURE: Removing a Power Supply
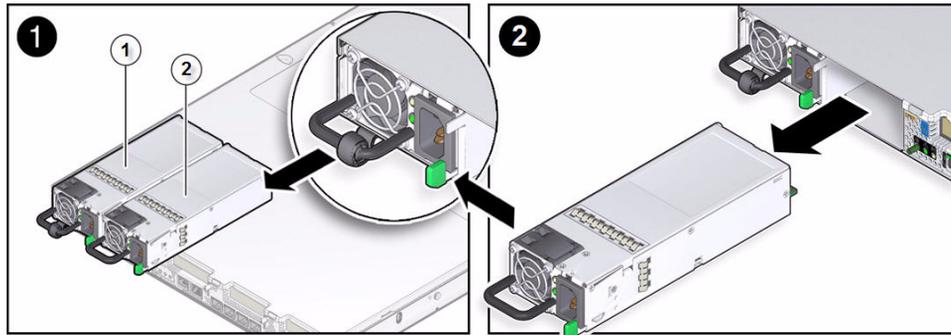
Figure Legend

1	Power Supply 0 (PS0)
2	Power Supply 1 (PS1)

6. Pull the power supply out of the chassis [2].

⚠️ **Caution –** Whenever you remove a power supply, you should replace it with another power supply; otherwise, the server might overheat due to improper airflow.

7. Continue to "Install a Power Supply" on page 59**.**

Related Information

- "Server Back Panel View" on page 5
- "Power Supply Status Indicators" on page 56
- "Install a Power Supply" on page 59

▼ Install a Power Supply

⚠ **Caution –** Always replace a faulty power supply with a power supply of the same type.

1. **Remove the replacement power supply from its packaging and place it on an antistatic mat.**

2. **Align the replacement power supply with the empty power supply slot [1].**

3. **Slide the power supply into the bay until it is fully seated [2].**

   You will hear an audible click when the power supply fully seats.
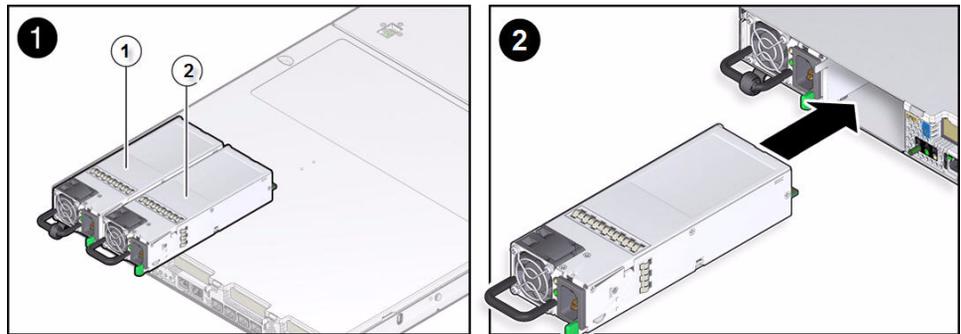
4. **Reconnect the power cord to the power supply.**

5. **Verify that the amber LED on the replaced power supply and the Service Required LEDs are not lit on the front and rear panels.**

Note – After you have replaced Power Supply 0, you must reset the Oracle ILOM service processor (SP) to propagate the FRU top-level indicator (TLI) data to the new power supply. For instructions on resetting the SP, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Configuration and Maintenance Guide at http://www.oracle.com/goto/ILOM/docs. Power Supply 1 does not contain FRU TLI data, and therefore does not require an SP reset after replacement.

6. **If you disconnected the two CMA left-side connectors, reconnect the connectors.**

   For instructions for reconnecting the CMA left-side connectors, see *Sun Server X4-2 Installation Guide*, "Install the Second-Generation Cable Management Arm" on page 52 or *Sun Server X4-2 Installation Guide*, "Install the First-Generation Cable Management Arm" on page 69 as applicable.

Related Information

-
-
-

Servicing CRUs That Require Server Power-Off

These sections describe how to service customer-replaceable units (CRUs) that require you to power off the server.

Description	Use
Learn about the locations of the CRUs.	"CRU Locations" on page 61
Service the DIMMs.	"Servicing the DIMMs (CRU)" on page 62
Service the PCIe Risers.	"Servicing PCIe Risers (CRU)" on page 74
Service the PCIe cards.	"Servicing PCIe Cards (CRU)" on page 84
Service the DVD drive.	"Servicing the DVD Drive (CRU)" on page 91
Service the internal USB flash drives.	"Servicing the Internal USB Flash Drives (CRU)" on page 94
Service the battery.	"Servicing the Battery (CRU)" on page 96

Related Information

- "Servicing CRUs That Do Not Require Server Power-Off" on page 45
- "Servicing FRUs" on page 99

CRU Locations

The CRU locations are shown in the following figure.

FIGURE: CRU Locations
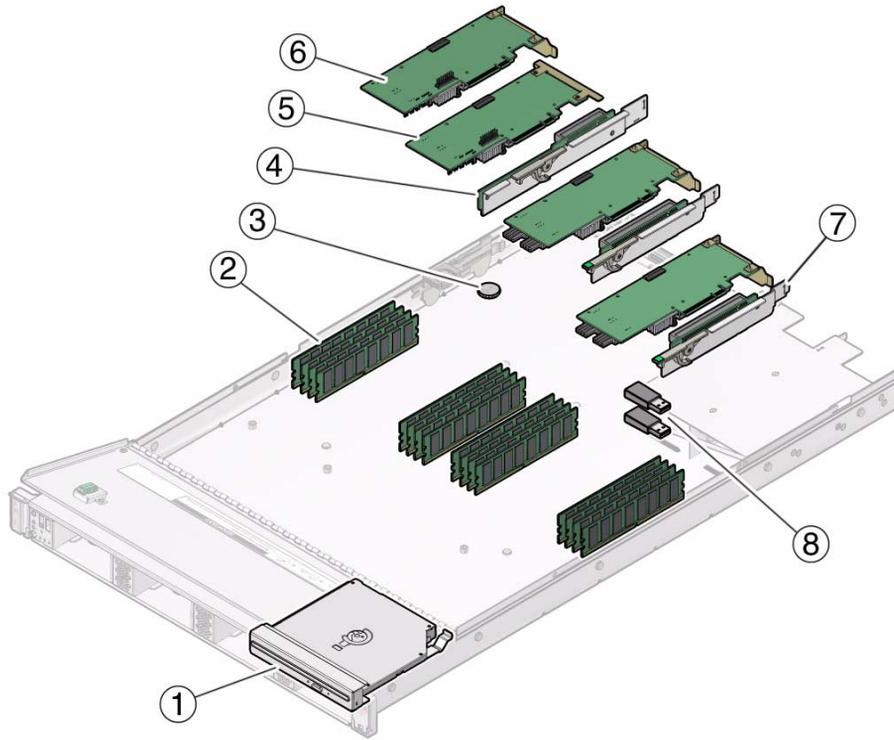
Figure Legend

1	DVD drive (CRU)	**5**	Internal HBA card (CRU) (installs in slot 4 on PCIe riser for slots 3 and 4)
2	DIMMS (CRUs) **Note:** A maximum of eight DIMMs are supported in single-processor systems and the DIMMs must be installed in DIMM sockets associated with the P0 processor socket.	**6**	PCIe card (CRU) (installs in slot 3 on PCIe riser for slots 3 and 4)
3	Battery (CRU)	**7**	PCIe riser for slot 1 (CRU) (nonfunctional in single-processor systems)
4	PCIe riser for slots 3 and 4 (CRU)	**8**	USB flash drives (CRU)

Servicing the DIMMs (CRU)

This section describes how to remove and install DIMMs.

In addition to the service procedures included here, you can see animations that show how to remove and install DIMMs.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

The Sun Server X4-2 supports a variety of DDR3 DIMM configurations that can include quad-rank (QR), dual-rank (DR), and single-rank (SR) DDR3 DIMMs.

Note – While single-rank DIMMs can be installed in the Sun Server X4-2, Oracle does not offer any single-rank DIMMs for purchase, either as factory-installed options or as separately orderable options.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

Caution – Ensure that all power is removed from the server before removing or installing DDR3 DIMMs, or damage to the DDR3 DIMMs might occur. You must disconnect all power cables from the system before performing these procedures.

The following sections provide information to assist you when replacing or upgrading a DIMM:

Related Information

- "Servicing CRUs That Require Server Power-Off" on page 61
- "Servicing FRUs" on page 99

DIMM and Processor Physical Layout

The physical layout of the DIMMs and processor(s) is shown in the following figure. When viewing the server from the front, processor 0 (P0) is on the left.

FIGURE: DIMM and Processor Physical Layout

Note – In single-processor systems, the DIMM sockets associated with the processor 1 (P1) socket are nonfunctional and should not be populated with DIMMs or DIMM filler panels.

Related Information

DIMM Population Example for Optimal System Performance

This section provides an example of how to populate the DIMM sockets to achieve optimal system performance.

Note – Not all possible configurations are shown here.

The following figure shows the order in which the DIMM sockets should be populated in dual-processor systems. In single-processor systems, you should follow the same order except that you should not install DIMMs in the DIMM sockets associated with processor 1 (P1) socket, because the P1 DIMM sockets are nonfunctional.

FIGURE: DIMM Population Order
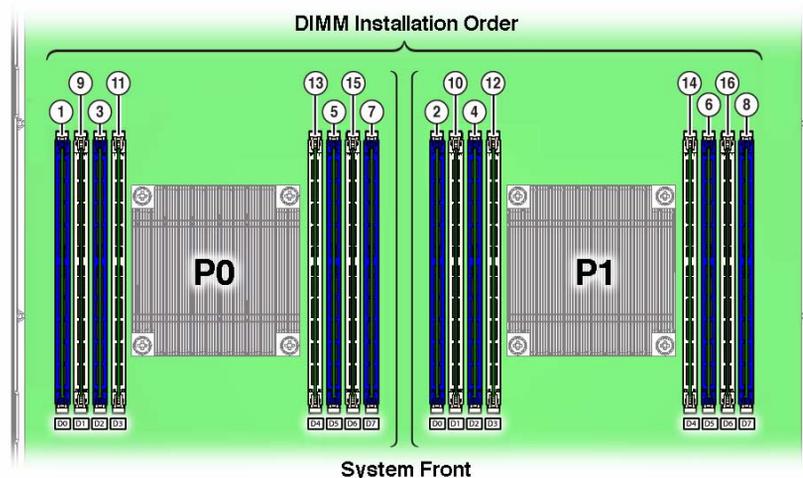
For more information on populating the DIMMs, see the following sections:

DIMM Population Order for Single-Processor Systems

In single-processor systems, DIMMs should only be installed into DIMM sockets associated with processor 0 (P0) starting with P0 D0, first filling the blue sockets and then the white. This DIMM population order is illustrated in FIGURE: DIMM Population Order on page 65.

The following table describes the order in which the DIMM sockets should be populated in single-processor systems. The figure callouts in column two of the table refer to the callouts in FIGURE: DIMM Population Order on page 65.

TABLE: DIMM Population Order for Single-Processor Systems

Population Order	Figure Callouts	DIMMs Sockets for Processor 0 (P0)
Fill the blue sockets first		
First	1	D0
Second	3	D2
Third	5	D5
Fourth	7	D7
Then fill the white sockets		
Fifth	9	D1
Sixth	11	D3
Seventh	13	D4
Eighth	15	D6

DIMM Population Order for Dual-Processor Systems

In dual-processor systems, DIMMs should be installed into DIMM sockets starting with P0 D0 and then alternating between sockets associated with processor 0 (P0) and matching sockets for processor 1 (P1), first filling the blue sockets and then the white. This DIMM population order is illustrated in FIGURE: DIMM Population Order on page 65.

The following table describes the order in which the DIMM sockets should be populated in dual-processor systems. The figure callouts in columns two and four of the table refer to callouts in FIGURE: DIMM Population Order on page 65.

TABLE: DIMM Population Order for Dual-Processor Systems

Population Order	Figure Callouts	DIMM Sockets for Processor 0 (P0)	Figure Callouts	DIMM Sockets for Processor 1 (P1)
Fill the blue sockets first				
First	1	Fill D0 first	2	Then D0
Second	3	Fill D2 first	4	Then D2
Third	5	Fill D5 first	6	Then D5
Fourth	7	Fill D7 first	8	Then D7
Then fill the white sockets				
Fifth	9	Fill D1 first	10	Then D1
Sixth	11	Fill D3 first	12	Then D3
Seventh	13	Fill D4 first	14	Then D4
Eighth	15	Fill D6 first	16	Then D6

DIMM Population Rules

The DIMM population rules for the server are as follows:

- In dual-processor systems, all DIMM sockets can have either a DIMM or DIMM filler panel installed.

Note – In dual-processor systems, DIMM filler panels are not required in sockets that do not have DIMMs installed.

- In single-processor systems, all DIMM sockets associated with processor 0 (P0) socket can have either a DIMM or DIMM filler panel installed. DIMM sockets associated with processor 1 (P1) socket must remain empty, that is, neither DIMMs nor DIMM filler panel should be installed.

Note – In single-processor systems, DIMM filler panels are not required in sockets that do not have DIMMs installed.

- A single DIMM configuration is supported.
- Do not populate DIMM sockets next to an empty processor socket. Each processor contains a separate memory controller.

- Each processor has four channels and can support two DIMMs per channel for a maximum of eight quad-rank (QR) Load Reduced DIMMs (LRDIMMs), dual-rank (DR) DIMMs, or single-rank (SR) DIMMs.

- The server supports 32-GB QR LRDIMMs in addition to 8-GB and 16-GB Registered DIMMs (RDIMMs).

- You cannot mix LRDIMMs and RDIMMs in the same server. If you choose to install 32-GB QR LRDIMMs in the server, you cannot install any 8-GB or 16-GB single-rank or dual-rank RDIMMs.

- If a you are installing a mix of RDIMM sizes (for example, 8-GB and 16-GB), install the larger RDIMMs first, then the smaller RDIMMs, until all of the RDIMMs are installed.

- If you are installing QR LRDIMMs within a channel, populate the blue sockets prior to populating the white sockets.

Note – While the processor used in the server supports four modes of operation—Independent Channel Mode, Lockstep Channel Mode, Mirrored Channel Mode, and, Device Tagging Mode—the server supports the Independent Channel Mode only.

Note – Each processor (P0, P1) has eight associated DIMM sockets, numbered D0, D1, D2, D3, D4, D5, D6, and D7.

- DIMMs should be installed into DIMM sockets starting with P0 D0 and alternating between sockets associate with P0 and matching sockets for P1, first filling the blue sockets and then the white. For an example of a configuration that follows this rule, see "DIMM Population Example for Optimal System Performance" on page 65.

- For maximum performance, apply the following rules:
    - The best performance is ensured by preserving symmetry. For example, add four of the same kind of DIMMs, one per memory channel, and if the server has two processors, ensure that both processors have the same size of DIMMs installed in the same manner.
    - For optimal performance, the memory installation should be identical across both sockets. Populate each socket with QR, DR, or SR DIMMs in sets of four, one per memory channel.

- All memory installed in the system will operate at the same speed. DIMM operational speed, or frequency, is limited to the lowest speed determined by each of the following factors:
    - Maximum memory frequency supported by processor
    - Maximum memory frequency supported by the installed DIMMs
    - Memory configuration within a channel

The table below lists the memory speed limitations associated with all the possible combinations of DIMMs within an individual memory channel.

Blue Socket	White Socket	Speed
Quad-rank LRDIMM	Empty	1600 MT/s
Dual-rank DIMM	Empty	1600 MT/s
Single-rank DIMM	Empty	1600 MT/s
Quad-rank LRDIMM	Quad-rank LRDIMM	1600 MT/s
Dual-rank DIMM	Dual-rank DIMM	1600 MT/s
Dual-rank DIMM	Single-rank DIMM	1600 MT/s
Single-rank DIMM	Single-rank DIMM	1600 MT/s

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. The following table identifies the label corresponding to each DIMM rank classification:

TABLE: DIMM Rank Classifications Labels

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

Note – While single-rank DIMMs can be installed in the Sun Server X4-2, Oracle does not offer any single-rank DIMMs for purchase, either as factory-installed options or as separately orderable options.

Inconsistencies Between DIMM Fault Indicators and the BIOS Isolation of Faulty DIMMs

When a single DIMM is marked as faulty by Oracle ILOM (for example, `fault.memory.intel.dimm.training-failed` is listed in the SP Event Log), BIOS might disable the entire memory channel that contains the faulty DIMM as failing, that is, up to two DIMMs. As a result, the memory available to the operating system is reduced. However, when the Fault Remind button is pressed, only the fault status indicator (LED) associated with the faulty DIMM lights. The fault LED for the other DIMM in the memory channel remains off. Therefore, you can correctly identify the faulty DIMM.

When the faulty DIMM is replaced, the memory available to the operating system returns to normal. If the DIMM fault message in Oracle ILOM is not cleared under Open Problems, you must manually clear the fault in Oracle ILOM. For instructions for manually clearing a DIMM fault, see the procedure "Clear Faults for Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.

Using the Fault Remind Button

When the Fault Remind button is pressed, an LED located next to the Fault Remind button lights green to indicate that there is sufficient voltage present in the fault remind circuit to light any fault LEDs that were lit due to a failure. If this LED fails to light when you press the Fault Remind button, it is likely that the capacitor powering the fault remind circuit has lost its charge. This can happen if the Fault Remind button is pressed for a long time with fault LEDs lit or if power has been removed from the server for more than 15 minutes.

The following figure shows the location of the Fault Remind button.

FIGURE: Fault Remind Button Location
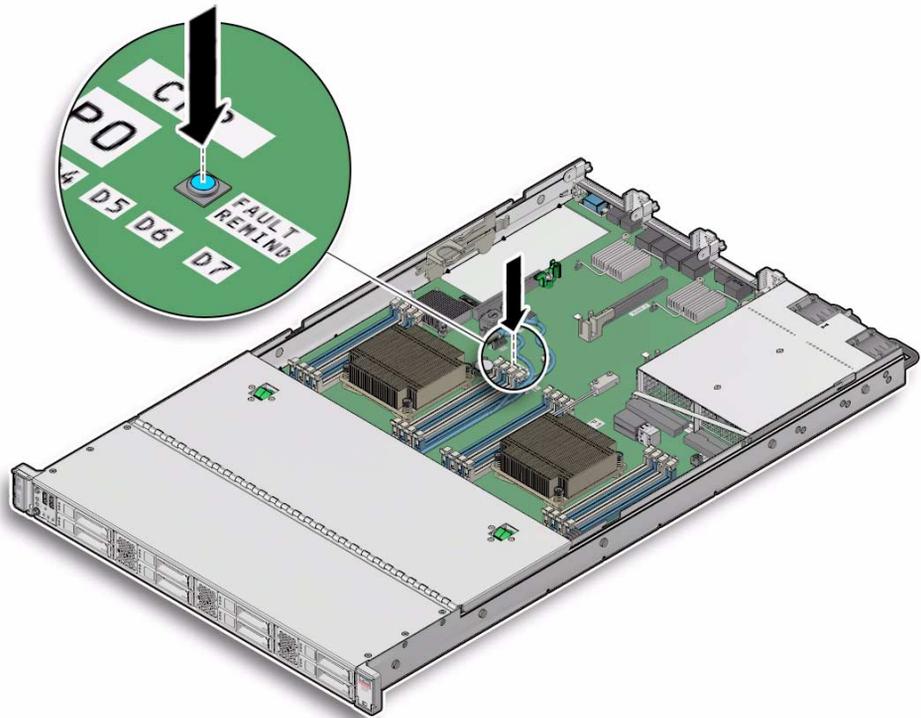
▼ Identify and Remove a Faulty DIMM

1. Prepare the server for service.

    a. Power off the server, and disconnect the power cords from the power supplies.

    See "Powering Down the Server" on page 33

    b. Extend the server to the maintenance position.

    See "Extend the Server to the Maintenance Position" on page 39.

    c. Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.

    See "Take Antistatic Measures" on page 42.

    d. Remove the server top cover.

    See "Remove the Server Top Cover" on page 43.

2. **Identify and note the location of the faulty DDR3 DIMM by pressing the Fault Remind button on the motherboard (see** "Using the Fault Remind Button" on page 70**).**

Faulty DDR3 DIMMs are identified with a corresponding amber LED on the motherboard.
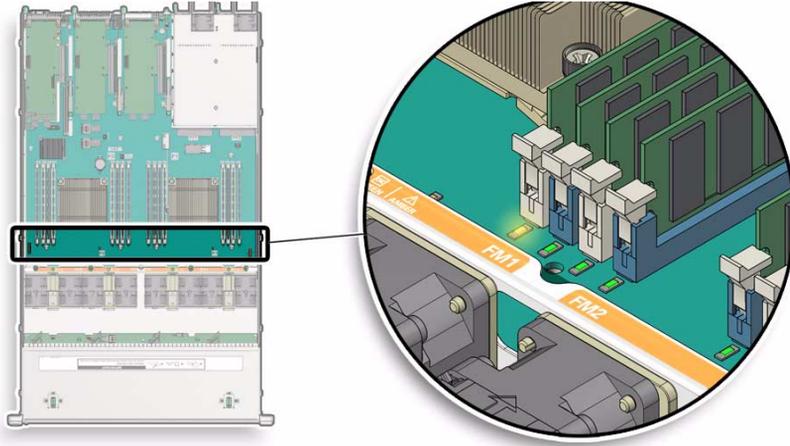
- If the DIMM fault LED is off, the DIMM is operating properly.
- If the DIMM fault LED is on (amber), then the DIMM is faulty and should be replaced.

3. **To remove the faulty DIMM do the following:**

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

   The DIMM is partially ejected from the socket (See FIGURE: DIMM Socket Release and Alignment on page 73).

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

4. **Replace each faulty DIMM with either another DIMM of the same rank size (quad rank, dual rank, or single rank) or leave the socket empty.**

Note – DIMM filler panels are optional and not required.

For DIMM replacement instructions, see "Install a DIMM" on page 73.

FIGURE: DIMM Socket Release and Alignment
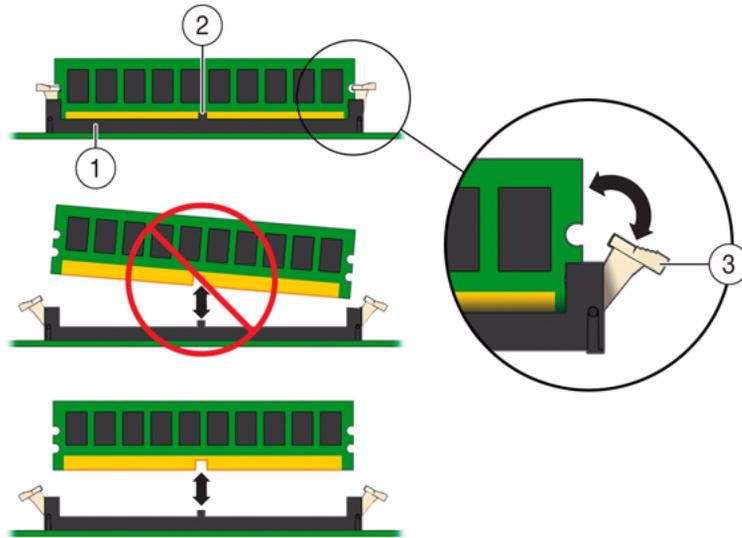
Figure Legend

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

▼ Install a DIMM

1. **Unpack the replacement DDR3 DIMM and place it on an antistatic mat.**

2. **Ensure that the replacement DDR3 DIMM matches the size of the DIMM it is replacing.**

   You must not replace a dual-rank DIMM with a quad-rank DIMM and vice versa. If you violate this rule, the performance of the server might be adversely affected. For DIMM socket population rules, see "DIMM Population Rules" on page 67.

3. **Install a DIMM.**

   a. **Ensure that the ejector tabs are in the open position.**

   b. **Align the notch in the replacement DIMM with the connector key in the connector socket.**

      The notch ensures that the DIMM is oriented correctly.

c. **Push the DDR3 DIMM into the connector until the ejector tabs lock the DIMM in place.**

   If the DIMM does not easily seat into the connector socket, verify that the notch in the DIMM is aligned with the connector key in the connector socket. If the notch is not aligned, damage to the DIMM might occur.

4. **Repeat** Step 3 **until all replacement DDR3 DIMMs are installed.**

5. **Return the server to operation.**

   a. **Install the server top cover.**

   See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

   See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cords to the server power supplies and reconnect the data cables.**

   See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

   See "Power On the Server" on page 150.

   Verify that the Power/OK status indicator is steady on.

6. **(Optional) Use Oracle ILOM to clear server DDR3 DIMM faults.**

   DDR3 DIMM faults are automatically cleared after a new memory DIMM has been installed. If you need to manually clear DDR3 DIMM faults, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.

Servicing PCIe Risers (CRU)

This section describes how to remove and install the PCIe risers.

In addition to the service procedures included here, you can see animations that show how to remove and install the PCIe risers.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

PCIe cards in all slots are installed on vertical risers. You must remove the relevant riser to remove and replace a PCIe card. You must remove all three PCIe risers when replacing the motherboard.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

Caution – Ensure that all power is removed from the server before removing or installing PCIe risers, or damage to the PCIe cards installed in the risers might occur. You must disconnect all power cables from the system before performing these procedures.

The following sections provide information to assist you in servicing PCIe risers:

Related Information

PCIe Riser Location and Differences

The PCIe riser that installs in PCIe slots 3 and 4 is different than the risers in PCIe slots 1 and 2. The riser for slots 3 and 4 supports two cards: a standard PCIe card and an internal HBA card. Do not attempt to install the PCIe riser for PCIe slots 3 and 4 in slots 1 or 2, and vice versa.

FIGURE: PCIe Riser Locations
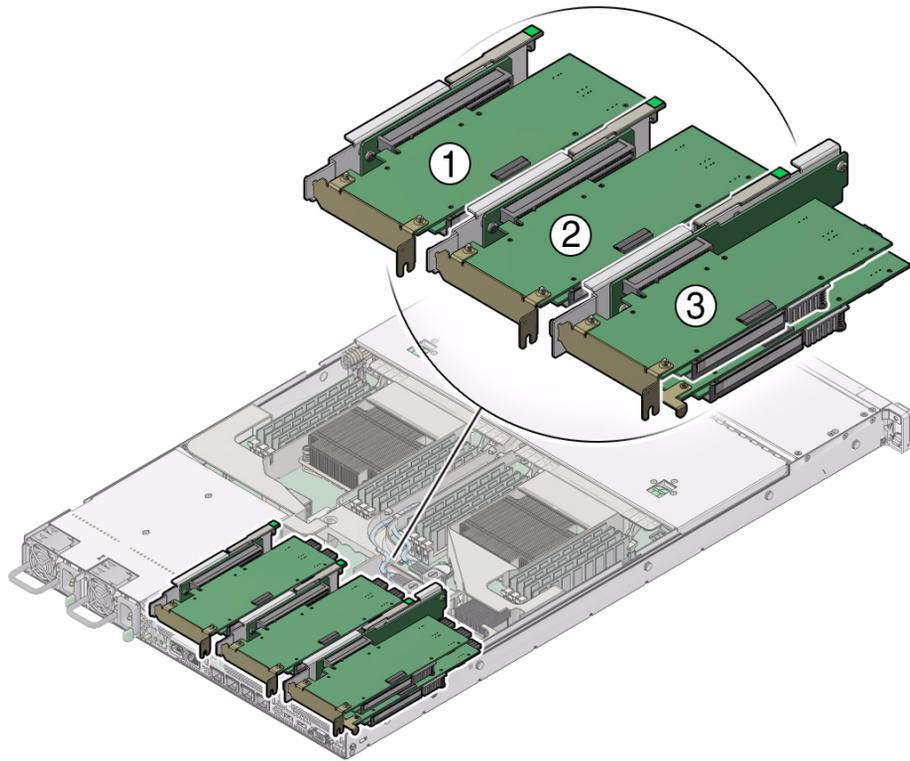
Figure Legend

1	PCIe riser and installed PCIe card in slot 1 (This slot is nonfunctional in single-processor systems.)
2	PCIe riser and installed PCIe card in slot 2
3	PCIe riser and installed cards (2) in slots 3 and 4 (this riser contains the internal HBA card.) **Note:** This riser is different from the risers in slots 1 and 2.

Related Information

■ "PCIe Slot Characteristics" on page 85

▼ Remove a PCIe Riser From PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33.

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Remove the server top cover.**

      See "Remove the Server Top Cover" on page 43.

2. **Select the PCIe riser that you want to remove.**

   See "PCIe Slot Characteristics" on page 85.

3. **If a PCIe card is installed in the riser, disconnect any external or internal cables from the card.**

4. **Lift the green-tabbed latch on the rear of the server chassis next to the applicable PCIe slot to release the rear bracket on the PCIe card [1].**
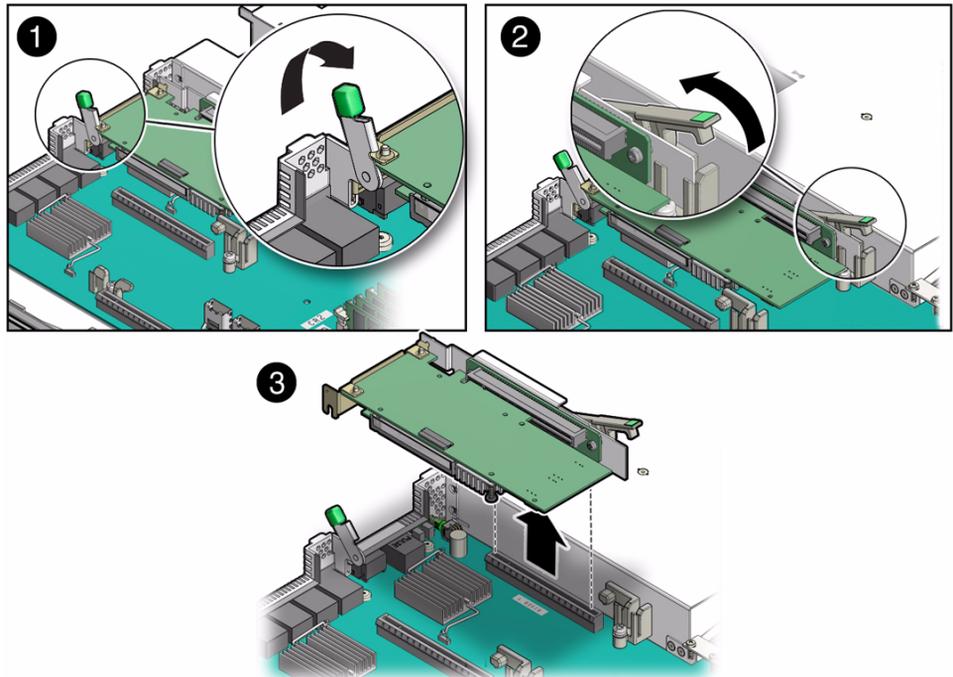
> **Note –** If the riser does not have a PCIe card installed, then lift the latch to release the PCIe slot filler panel.

5. **Lift the green-tabbed riser release lever on the PCIe riser with one hand and use your other hand to remove the riser from the motherboard connector [2, 3].**

6. **If there is a PCIe card installed in the riser, place the riser on an antistatic mat and note the slot in which the PCIe riser was originally installed; otherwise, set the PCIe riser aside.**

Related Information

- "Install a PCIe Riser Into PCIe Slot 1 or 2" on page 78

▼ Install a PCIe Riser Into PCIe Slot 1 or 2

> **Note –** PCIe slot 1 is nonfunctional in single-processor systems.

> **Note –** The PCIe riser in slots 3 and 4 is different than the PCIe risers in slots 1 and 2. Do not attempt to install a PCIe riser from slot 1 or 2 into PCIe slots 3 and 4 and vice versa.

1. **Determine into which slot you will install the PCIe riser.**

2. **Retrieve the PCIe riser and any PCIe cards attached to it.**

3. **Raise the green-tabbed release lever on the PCIe riser to the open (up) position [1].**

4. **Gently press the riser into the motherboard connector until it is seated, and then press the green-tabbed release lever on the PCIe riser to the closed (down) position [2].**
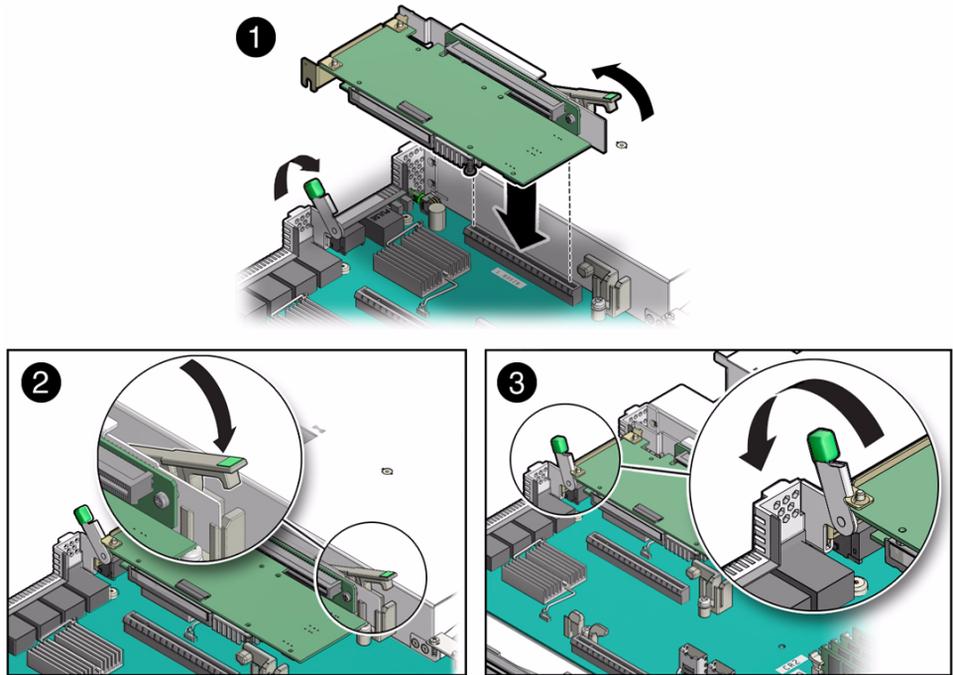
5. **If there is a PCIe card installed in the riser, reconnect any external or internal cables to the card.**

6. **Close the green-tabbed latch on the rear of the server chassis next to the applicable PCIe slot to secure the rear bracket on the PCIe card to the server chassis [3].**

Note – If the riser does not have a PCIe card installed, install a PCIe slot filler panel and close the green-tabbed latch to secure the filler panel.

---

7. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cords to the server power supplies and reconnect the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 149.

e. **Power on the server.**

   See "Power On the Server" on page 150.

   Verify that the Power/OK status indicator is steady on.

8. **Use Oracle ILOM to clear the server PCIe riser fault.**

   If the PCIe riser fault message in Oracle ILOM is not cleared under Open Problems, you must manually clear the fault in Oracle ILOM. For instructions for manually clearing a PCIe riser fault, see the procedure "Clear Faults for Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.

Related Information

- "Remove a PCIe Riser From PCIe Slot 1 or 2" on page 76

▼ Remove a PCIe Riser From PCIe Slots 3 and 4

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Remove the server top cover.**

      See "Remove the Server Top Cover" on page 43.

2. **If there is a PCIe card installed in the riser, disconnect any external or internal cables.**

Note – Do not disconnect the SAS cable from the internal host bus adapter card until after you have removed the riser from the server.

---

3. **Open the green-tabbed latch located on the rear of the server chassis next to PCIe slot 3 to release the rear bracket on the PCIe card [1].**
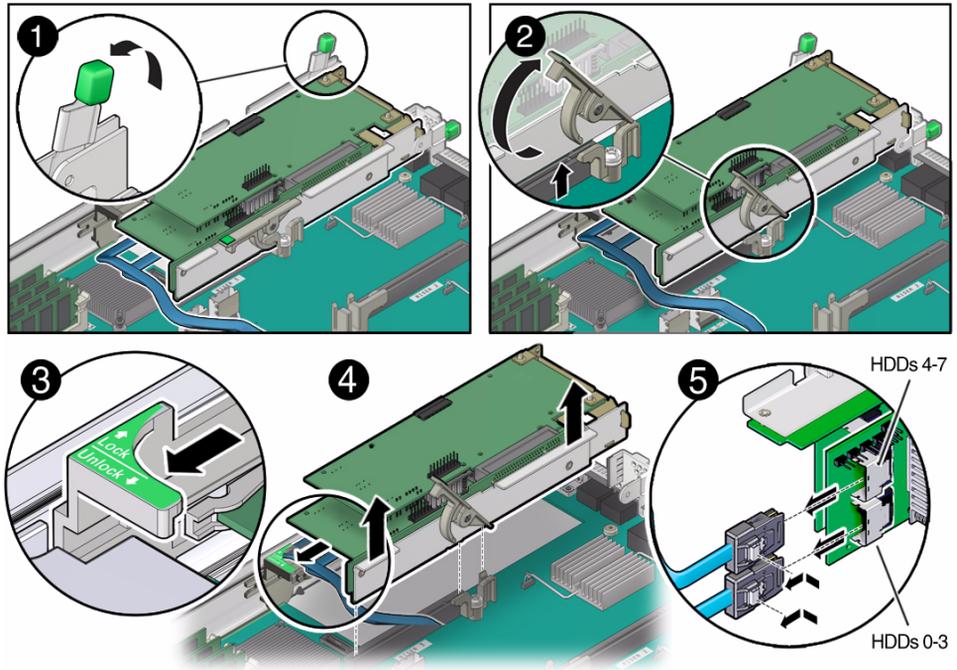
Note – If the riser does not have a PCIe card installed in slot 3, then lift the latch to release the PCIe slot 3 filler panel.

4. **To release the riser from the motherboard connector, lift the green-tabbed lease lever on the PCIe riser to the open position [2].**

5. **Slide the plastic PCIe card retainer, which is mounted on the side of the chassis, toward the front of the server to release the card(s) installed in the riser [3].**

6. **Grasp the riser with both hands and remove it from the server [4].**

7. **Disconnect the SAS storage drive (HDD) cables from the internal HBA card installed in PCIe slot 4 [5].**

Note – If the server has four or fewer storage drives, the SAS cable for HDDs 0-3 will be the only one installed.

8. **Place the riser on an antistatic mat.**

Related Information

- "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 82

▼ Install a PCIe Riser Into PCIe Slots 3 and 4

Note – The PCIe riser in slots 3 and 4 is different than the PCIe risers in slots 1 and 2. Do not attempt to install a PCIe riser from slot 1 or 2 into PCIe slots 3 and 4 and vice versa.

1. **Retrieve the PCIe riser and any PCIe cards attached to it.**

2. **Reconnect the SAS cable(s) to the internal host bus adapter card [1].**

   Be sure to connect the SAS cable for storage drives 0 through 3 (HDDs 0-3) to the connector that is farthest from the riser in which the HBA card is installed; otherwise, the server will incorrectly identify the storage drives when it is powered on.
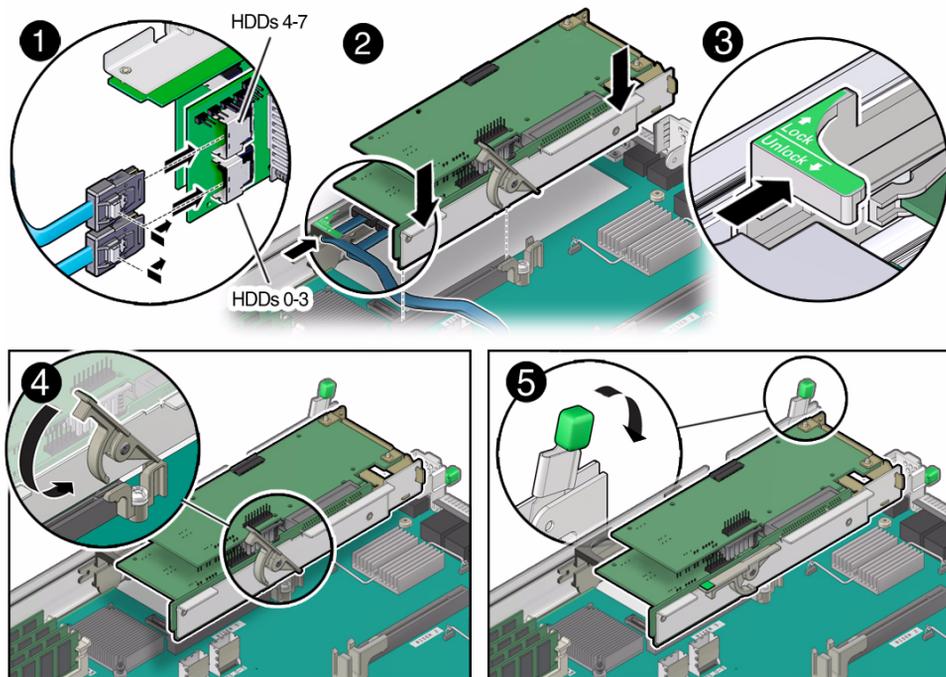
3. **Raise the green-tabbed release lever on the PCIe riser to the open (up) position, and then gently press the riser into the motherboard connector until it is seated [2].**

4. **Ensure that the rear bracket on the internal HBA card in PCIe slot 4 is connected to the slot in the server chassis side wall.**

   If the bracket is not connected, remove the riser and reposition it so that the rear bracket connects to the side wall, and then gently press the riser into the motherboard connector.

5. **Slide the plastic PCIe card retainer, which is mounted on the side of the chassis, toward the back of the server to secure the card(s) installed in the riser [3].**

6. **Press the green-tabbed release lever on the PCIe riser to the closed (down) position [4].**

7. **To secure the rear bracket on the PCIe card to the server, close the green-tabbed latch on the rear of the server chassis [5].**

Note – If the riser does not have a PCIe card installed in slot 3, install a PCIe slot filler panel and close the green-tabbed latch to secure the PCIe slot filler panel.

---

8. **If there is a PCIe card installed in slot 3 of the riser, reconnect any external or internal cables to the card.**

9. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cord to the server power supply and the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

10. **Use Oracle ILOM to clear the server PCIe riser fault.**

    If the PCIe riser fault message in Oracle ILOM is not cleared under Open Problems, you must manually clear the fault in Oracle ILOM. For instructions for manually clearing a PCIe riser fault, see the procedure "Clear Faults for Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.

Related Information

■ "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 80

Servicing PCIe Cards (CRU)

These sections describe how to remove and install PCIe cards. Refer to your PCIe card documentation for complete software and cabling information about your card.

In addition to the service procedures included here, you can see animations that show how to remove and install the PCIe cards.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
`http://docs.oracle.com/cd/E36975_01/html/E49470/index.html`

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

Caution – Ensure that all power is removed from the server before removing or installing PCIe cards. You must disconnect all power cables from the system before performing these procedures.

Note – For a complete list of supported PCIe cards, see the *Sun Server X4-2 Product Notes* at `http://www.oracle.com/goto/X4-2/docs`.

The following sections provide information to assist you when servicing PCIe cards:

■ "PCIe Slot Characteristics" on page 85
■ "Remove a PCIe Card From PCIe Slot 1 or 2" on page 86
■ "Install a PCIe Card in PCIe Slot 1 or 2" on page 87
■ "Remove a PCIe Card From PCIe Slot 3" on page 87
■ "Install a PCIe Card in PCIe Slot 3" on page 88
■ "Remove the Internal HBA Card From PCIe Slot 4" on page 89

- "Install the Internal HBA Card in PCIe Slot 4" on page 90

Related Information

- "Servicing PCIe Risers (CRU)" on page 74

PCIe Slot Characteristics

There are three external and one internal PCIe slots available in the Sun Server X4-2. The external slots support optional, standard PCIe cards and are numbered 1, 2, and 3 from left to right when you view the server from the rear. The internal slot, which installs on the riser in PCIe slots 3 and 4, supports a required internal SAS controller HBA card. For a view of the rear panel that shows PCIe slot numbering, see "Server Back Panel View" on page 5.

Note – PCIe slot 1 is nonfunctional in single-processor systems.

Note – All of the PCIe slots comply with the PCI Express 3.0 specification and can accommodate 25 watt PCIe cards.

The following table lists the characteristics and requirements of the PCIe slots.

Slot Number	Supported PCIe Card Types	Supported PCIe Specifications	Slot Connector Width/PCI Express Lanes
1	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x16 mechanical/x16 electrical
2	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x16 mechanical/x8 electrical
3 and 4	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x8 mechanical/x8 electrical

Related Information

- "Server Back Panel View" on page 5

▼ Remove a PCIe Card From PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

1. **Remove the PCIe riser from the server.**

   For instructions, see "Remove a PCIe Riser From PCIe Slot 1 or 2" on page 76.

2. **Remove the PCIe card from the PCIe riser.**

   a. **Hold the riser in one hand and use your other hand to carefully pull the PCIe card connector out of the riser.**

   b. **Disconnect the rear bracket that is attached to the PCIe card from the rear of the PCIe riser.**
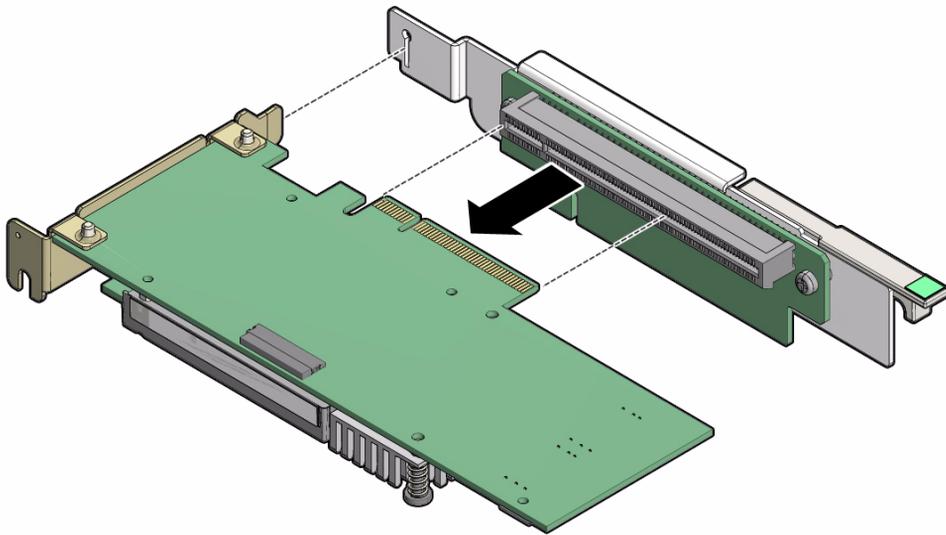
3. **Place the PCIe card on an antistatic mat.**

Caution – Whenever you remove a PCIe card, you should replace it with another PCIe card or a PCIe filler panel. Installing PCIe filler panels in vacant PCIe slots helps reduce the level of electromagnetic interference (EMI) emitted by the server. For instructions for installing a PCIe filler panel, see "Removing and Installing Server Filler Panels" on page 143.

▼ Install a PCIe Card in PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

1. **Retrieve the PCIe card and riser you to install.**

2. **Insert the rear bracket that is attached to the PCIe card into the PCIe riser.**

3. **Hold the riser in one hand and use your other hand to carefully insert the PCIe card connector into the Riser.**
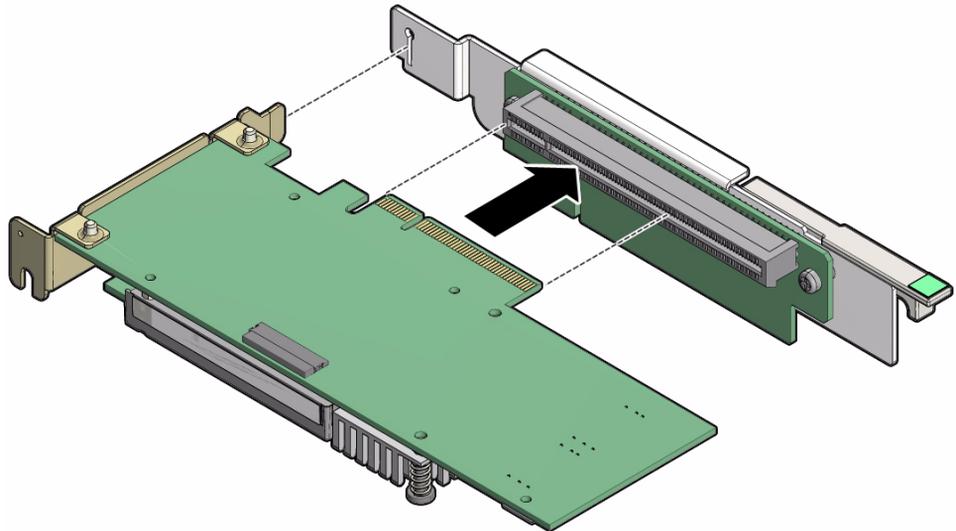
4. **Install the PCIe riser into the server.**

   For instructions, see "Install a PCIe Riser Into PCIe Slot 1 or 2" on page 78.

▼ Remove a PCIe Card From PCIe Slot 3

1. **Remove the PCIe riser from the server.**

   For instructions, see "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 80

2. **Remove the PCIe card from the riser.**

   a. **Hold the riser in one hand and use your other hand to carefully remove the PCIe card connector from the riser.**

b. Disconnect the rear bracket attached to the PCIe card from the rear of the PCIe riser.
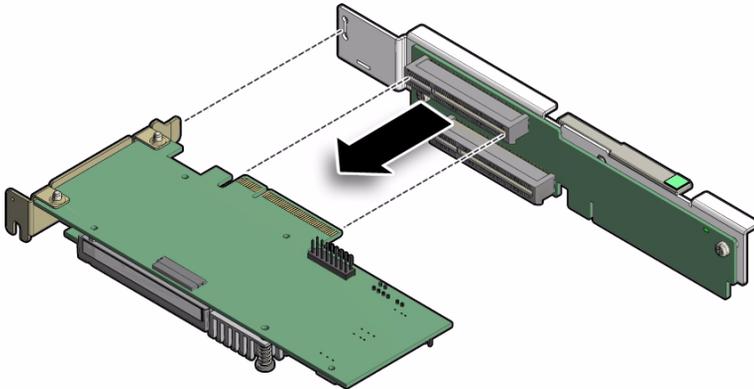
3. Place the PCIe card on an antistatic mat.

Caution – Whenever you remove a PCIe card, you should replace it with another PCIe card or a PCIe filler panel. Installing PCIe filler panels in vacant PCIe slots helps reduce the level of electromagnetic interference (EMI) emitted by the server. For instructions for installing PCIe filler panels, see "Removing and Installing Server Filler Panels" on page 143.

▼ Install a PCIe Card in PCIe Slot 3

1. Retrieve the PCIe card and riser you to install.

2. Insert the rear bracket that is attached to the PCIe card into the PCIe riser.

3. Hold the riser in one hand and use your other hand to carefully insert the PCIe card connector into the riser.
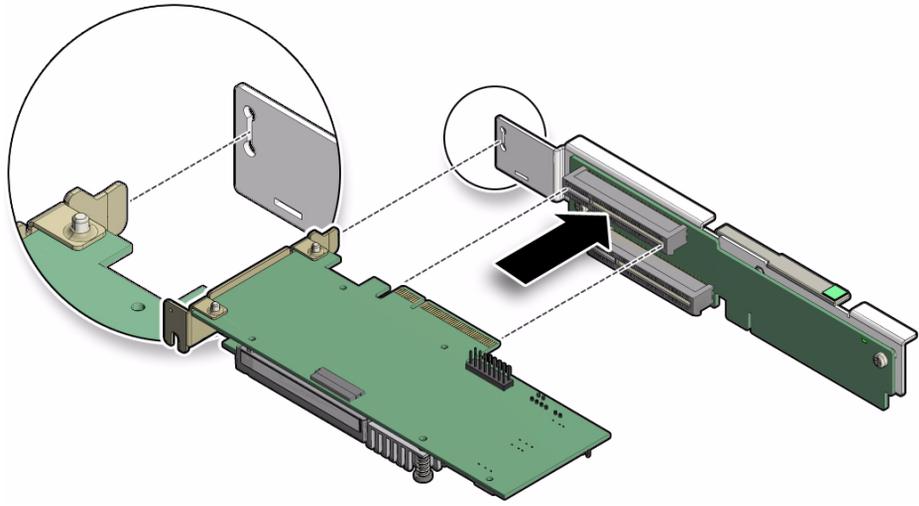
4. **Install the PCIe riser.**

   For instructions, see "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 82.

▼ Remove the Internal HBA Card From PCIe Slot 4

1. **Remove the PCIe riser from slots 3 and 4.**

   For instructions, see "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 80.

2. **Remove the internal host bus adapter card from the riser.**

   a. **Hold the riser in one hand and use your other hand to carefully remove the card from slot 4 of the riser.**

   b. **Disconnect the rear bracket attached to the PCIe card from the rear of the PCIe riser.**
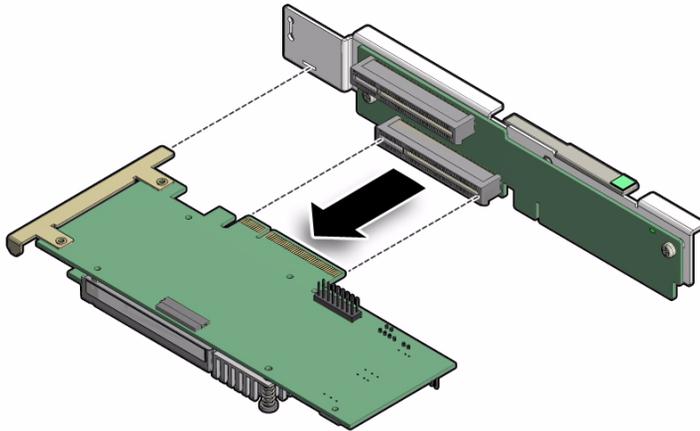
3. **Place the PCIe card on an antistatic mat.**

▼ Install the Internal HBA Card in PCIe Slot 4

1. **Retrieve the host bus adapter (HBA) card and riser you to install.**

2. **Insert the rear bracket that is attached to the internal HBA card into the rear connector on the PCIe riser.**

3. **Insert the internal HBA card connector into the bottom connector on the riser.**
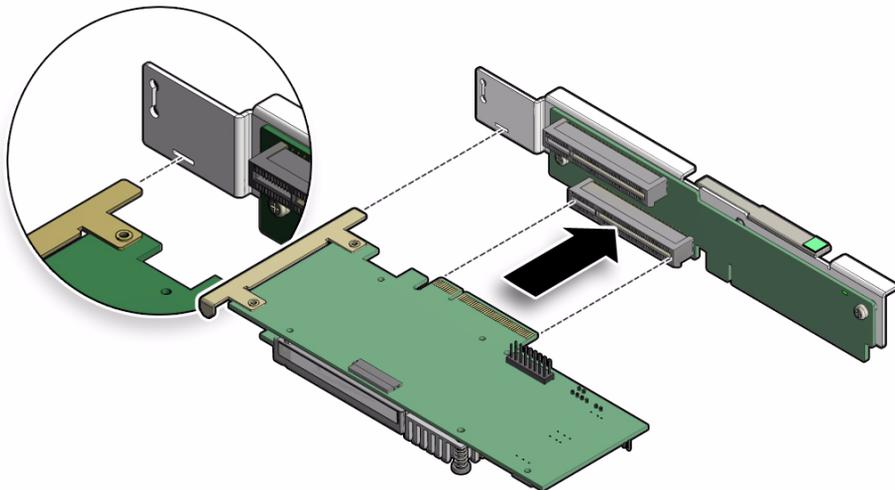
4. **Install the PCIe riser.**

   For instructions, see "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 82.

Servicing the DVD Drive (CRU)

Note – The DVD drive is only available in the four-drive systems.

The DVD drive is accessible from the front panel of the system.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

Caution – Ensure that all power is removed from the server before removing or installing the DVD drive or damage to the drive might occur. You must disconnect all power cables from the system before performing these procedures.

The following procedures are provided in this section:
- "Remove the DVD Drive" on page 91.
- "Install the DVD Drive" on page 93.

Related Information
- "Disconnect Cables From the Server" on page 39
- "Extend the Server to the Maintenance Position" on page 39
- "Open the Server Fan Door" on page 43

▼ Remove the DVD Drive

1. **Remove any media from the DVD drive.**

2. **Prepare the server for service.**

a. **Power off the server and disconnect the power cords from the power supplies.**

   See "Powering Down the Server" on page 33.

b. **Extend the server to the maintenance position.**

   See "Extend the Server to the Maintenance Position" on page 39.

c. **Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42.

d. **Remove the server top cover.**

   See "Remove the Server Top Cover" on page 43.

3. **Locate the DVD drive [1].**

4. **Disconnect the cable from the rear of the DVD [2].**

FIGURE: Removing the DVD Drive
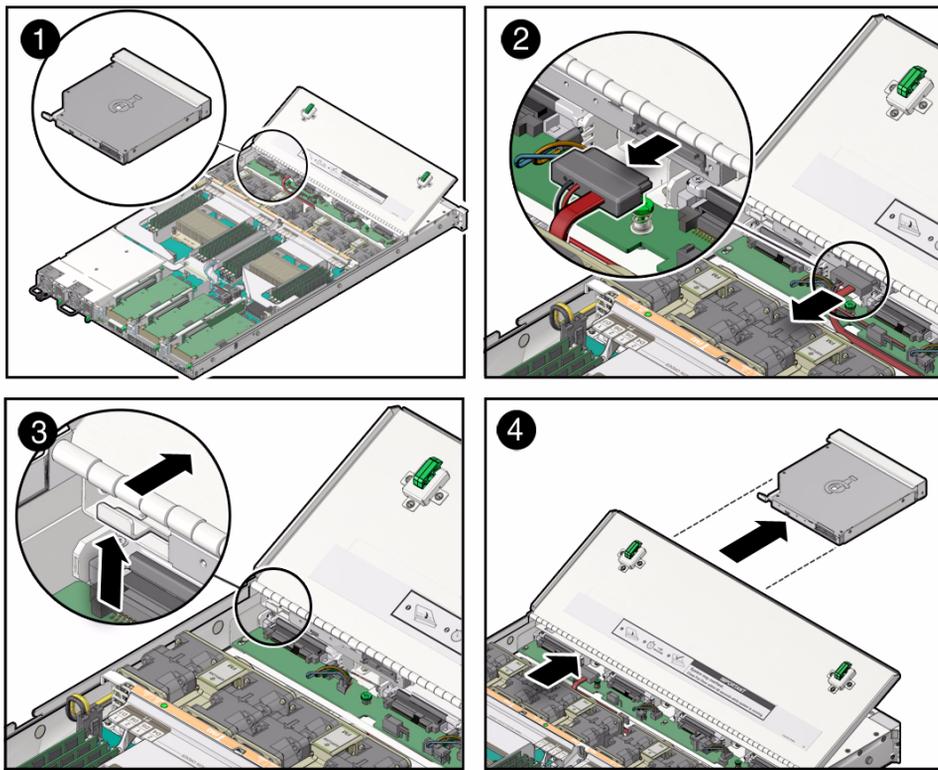
5. **To disengage the DVD drive from the chassis, press and hold the release tab on the rear of the DVD drive up slightly [3].**

6. **Gently push the DVD drive toward the front of the server, slide it out of the server, and place it on an antistatic mat [4].**

7. **Place the DVD drive on an antistatic mat.**

Related Information

■ "Install the DVD Drive" on page 93

▼ Install the DVD Drive

1. **Push the DVD drive into the chassis until the release tab on the rear of the DVD drive engages the chassis with an audible click (see** FIGURE: Removing the DVD Drive on page 92 **[4]).**

2. **Reconnect the DVD drive cable [2].**

3. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cords to the server power supplies and reconnect the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

Related Information

■ "Remove the DVD Drive" on page 91

Servicing the Internal USB Flash Drives (CRU)

⚠ **Caution –** These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

⚠ **Caution –** Ensure that all power is removed from the server before removing or installing a flash drive or damage to the drive might occur. You must disconnect all power cables from the system before performing these procedures.

The following procedures are provided in this section:

■ "Servicing the Oracle System Assistant USB Flash Drive" on page 94

■ "Remove an Internal USB Flash Drive" on page 95

■ "Install an Internal USB Flash Drive" on page 95

Related Information

■ "Extend the Server to the Maintenance Position" on page 39

■ "Remove the Server Top Cover" on page 43

Servicing the Oracle System Assistant USB Flash Drive

If the Oracle System Assistant software is corrupted on the USB flash drive, you should try to repair it before replacing the USB flash drive.

For instructions for troubleshooting and repairing Oracle System Assistant, see the Oracle System Assistant troubleshooting information in the *Oracle X4 Series Servers Administration Guide* at `http://www.oracle.com/goto/x86AdminDiag/docs`.

▼ Remove an Internal USB Flash Drive

The server can be equipped with up to two internal USB flash drives. Before you remove a the USB flash drive on which Oracle System Assistant is installed, review "Servicing the Oracle System Assistant USB Flash Drive" on page 94

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Remove the server top cover.**

      See "Remove the Server Top Cover" on page 43.

2. **To access the USB flash drives, remove the USB flash drive cover [1].**

FIGURE: Removing an Internal USB Flash Drive
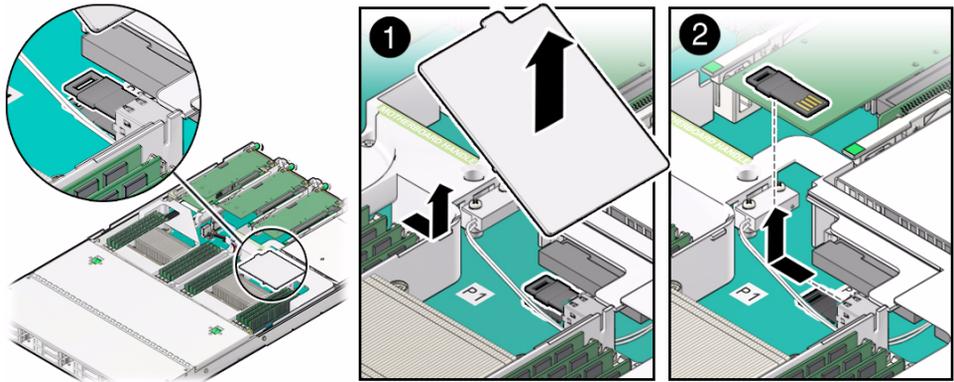
3. **Grasp the USB flash drive and pull it out of the internal USB port [2].**

▼ Install an Internal USB Flash Drive

1. **Unpack the replacement USB flash drive.**

2. **Insert the USB flash drive into the internal USB port (see** FIGURE: Removing an Internal USB Flash Drive on page 95 **[2]).**

3. **Install the USB flash drive cover [1].**

4. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cords to the server power supplies and reconnect the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

5. **If the USB flash drive that you replaced was the Oracle System Assistant USB flash drive, you need reinstall Oracle System Assistant on the new USB flash drive. For instructions, see the procedures for restoring Oracle System Assistant in the** *Oracle X4 Series Servers Administration Guide* **at** `http://www.oracle.com/goto/x86AdminDiag/docs`**.**

Servicing the Battery (CRU)

The battery maintains system time when the server is powered off and a time server is unavailable. If the server fails to maintain the proper time when the server is powered off and not connected to a network, replace the battery.

Caution – Ensure that all power is removed from the server before removing or installing the battery. You must disconnect the power cables from the system before performing these procedures.

The following procedures are provided in this section:

■ "Remove the Battery" on page 97

- "Install the Battery" on page 98

Related Information

▼ Remove the Battery

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33.

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Remove the server top cover.**

      See "Remove the Server Top Cover" on page 43.

2. **To dislodge the battery from the retainer, place your finger under the side of the battery nearest the rear of the server [1] and gently lift the battery up and out of the retainer [2].**

FIGURE: Removing the Battery
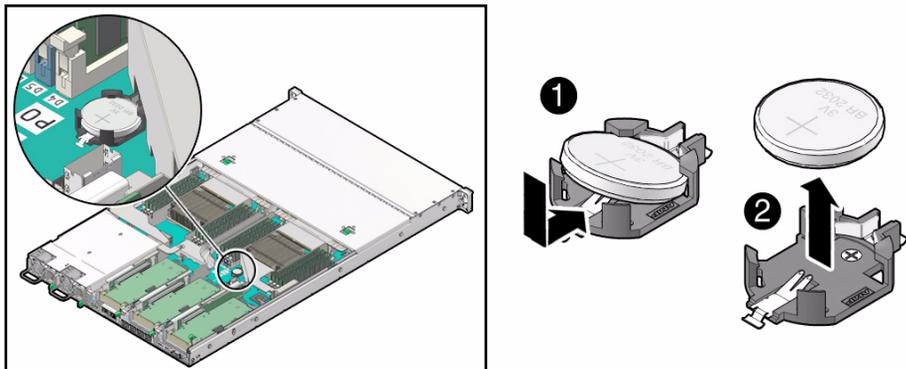
▼ Install the Battery

1. **Unpack the replacement battery.**

2. **Press the new battery into the battery retainer with the positive side (+) facing up (see** FIGURE: Removing the Battery on page 97**[1]).**

3. **If the service processor is configured to synchronize with a network time server using the Network Time Protocol (NTP), the Oracle ILOM clock will be reset as soon as the server is powered on and connected to the network; otherwise, proceed to the next step.**

4. **If the service processor is not configured to use NTP, you must do the following:**

   a. **Reset the Oracle ILOM clock using the Oracle ILOM CLI or the web interface.**

      For instructions, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: http://www.oracle.com/goto/ILOM/docs.

   b. **Use the BIOS Setup Utility to reprogram the host clock.**

      For the BIOS Main menu screen that supports this procedure, see the *Oracle X4 Series Servers Administration Guide* at http://www.oracle.com/goto/x86AdminDiag/docs.

5. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the power cords to the server power supplies and reconnect the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

Note – On first boot, use the BIOS Setup utility to reset the server host time.

Servicing FRUs

The following sections describe how to service field-replaceable units (FRUs). You must power down the system and disconnect the AC power cords from the server before servicing any of these components.

Note – Only Oracle authorized service personnel should service FRUs.

Description	Link
Identify FRU locations.	"FRU Locations" on page 99
Service the processor(s).	"Servicing Processors (FRU)" on page 100
Service the disk backplane.	"Servicing the Disk Backplane (FRU)" on page 117
Service the front indicator module.	"Servicing the Front Indicator Module (FRU)" on page 125
Service the motherboard.	"Servicing the Motherboard (FRU)" on page 127
Service the server SAS cables.	"Servicing the SAS Cables (FRUs)" on page 138

Related Information

- "Servicing CRUs That Do Not Require Server Power-Off" on page 45
- "Servicing CRUs That Require Server Power-Off" on page 61

FRU Locations

The locations of the FRUs are shown in the following figure.

FIGURE: FRU Locations
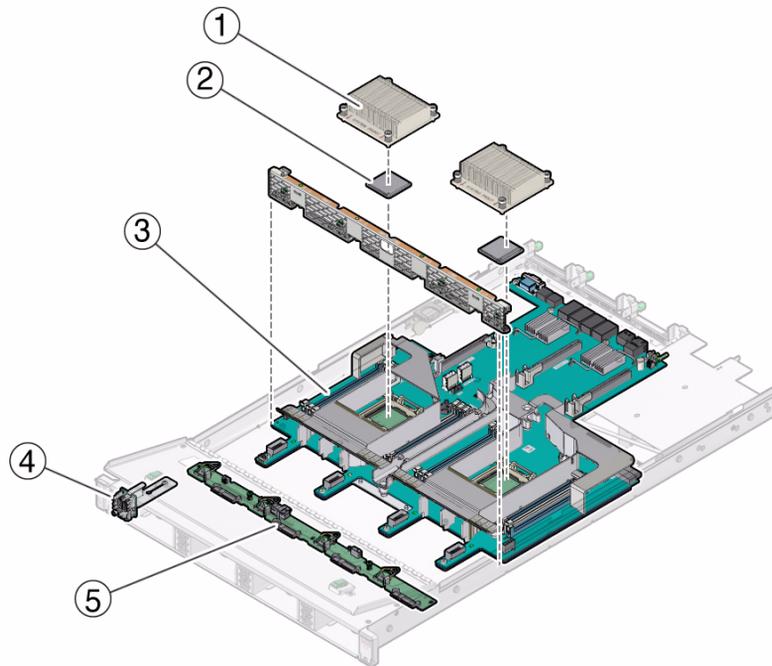
Figure Legend

1	Heatsink(s) **Note:** In single-processor systems, neither a heatsink nor a processor socket filler are installed in the socket for processor 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.	**4**	Front Indicator Module (FIM) (FRU)
2	Processor(s) (FRU) **Note:** In single-processor systems, the processor is installed in socket 0 (P0).	**5**	Disk backplane (FRU)
3	Motherboard (FRU)	**6**	Not applicable

Servicing Processors (FRU)

This section describes how to remove and install the processors.

In addition to the service procedures included here, you can see animations that show how to remove and install the processors.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

Caution – Ensure that all power is removed from the server before removing or installing a processor. You must disconnect the power cables from the server before performing these procedures.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

Note – On single-processor systems, neither a heatsink nor a processor filler cover are installed in the processor socket 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.

These following sections provide information to assist you when replacing a processor:

- "Selecting the Correct Processor Removal/Replacement Tool" on page 102
- "Remove a Processor" on page 106
- "Install a Processor" on page 112

Related Information

- "Disconnect Cables From the Server" on page 39
- "Take Antistatic Measures" on page 42
- "Remove the Server From the Rack" on page 41
- "Remove the Server Top Cover" on page 43

Selecting the Correct Processor Removal/Replacement Tool

⚠ **Caution –** The correct processor removal/replacement tool must be used to remove and replace a processor; otherwise, the processor or the processor socket might be damaged.

Selecting the correct processor removal/replacement tool is a two-step process. First you determine the size of the processor that is being replaced, then you select the removal/replacement tool that fits that size.

The processors supported by the Sun Server X4-2 come in two sizes. The processors with 10 or fewer cores are smaller than the processors with 12 cores. You can determined the size of the processor that you are going to remove and replace in either of two ways:

- Use Oracle Integrated Lights Out Manager (ILOM) to display processor information.

  For instructions for using Oracle ILOM to display processor information, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library.

  Or

- Visually check the size of the processor installed in the server.

  This requires that you remove the processor heatsink and open the processor independent loading mechanism (ILM) assembly that holds the processor in the socket. For instructions, see "Remove a Processor" on page 106. This is the same procedure that you will use when you remove the processor.

If you choose to visually check the size of the processor, refer to the next two figures to see how to distinguish the smaller processors from the larger processors. FIGURE: Smaller Processor Installed in a Motherboard Processor Socket on page 103 shows a smaller processor installed. Notice that the right and left edges of the processor are within the boundaries of the processor alignment brackets.

FIGURE: Smaller Processor Installed in a Motherboard Processor Socket
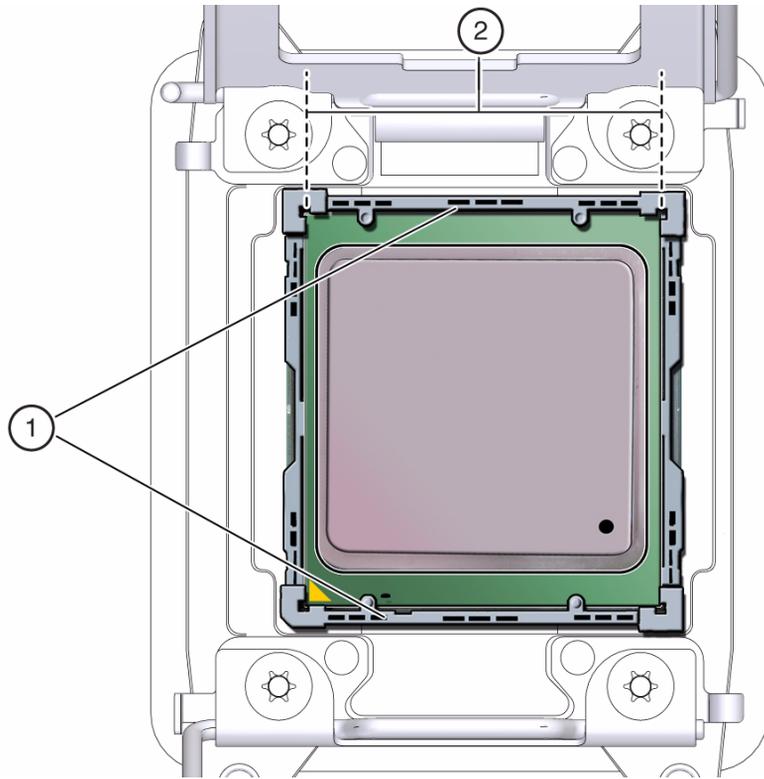
Figure Legend

1	Processor alignment brackets
2	Processor left and right edges are within alignment bracket boundaries

shows a larger processor installed. Notice that the right and left edges of the
processor extend beyond the boundaries of the processor alignment brackets.

FIGURE: Larger Processor Installed in a Motherboard Processor Socket
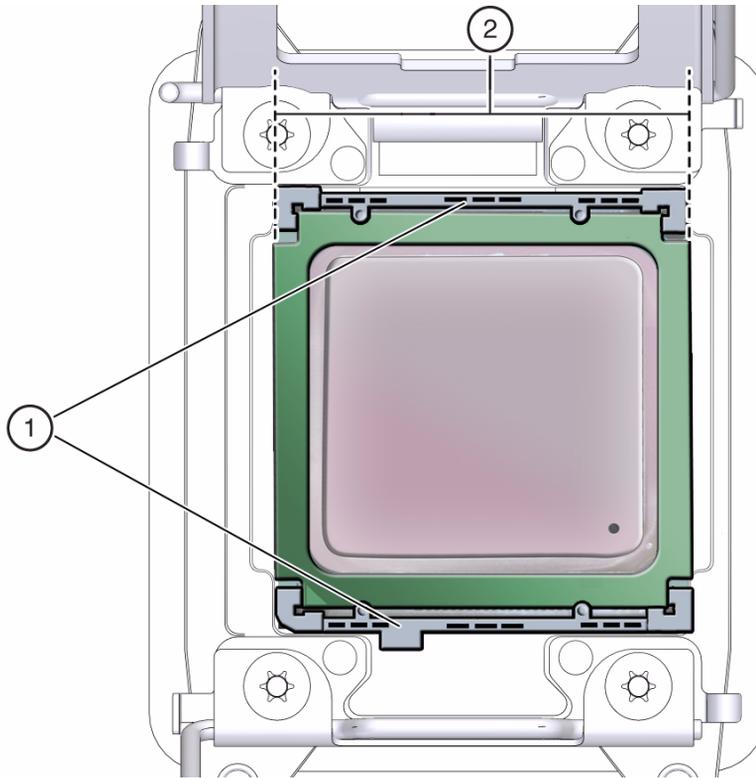
Figure Legend

1	Processor alignment brackets
2	Processor left and right edges extend beyond alignment bracket boundaries

After you have determined the size of the processor installed in your server, select the correct processor removal/replacement tool. Like the processors, the processor removal/replacement tool also comes in two sizes. The tool for the smaller processors (processors with 10 or fewer cores) is color-coded green. The tool for the larger processors (12-core processors) is color-coded pink. See FIGURE: Color-Coded Processor Removal/Replacement Tools on page 105.

FIGURE: Color-Coded Processor Removal/Replacement Tools
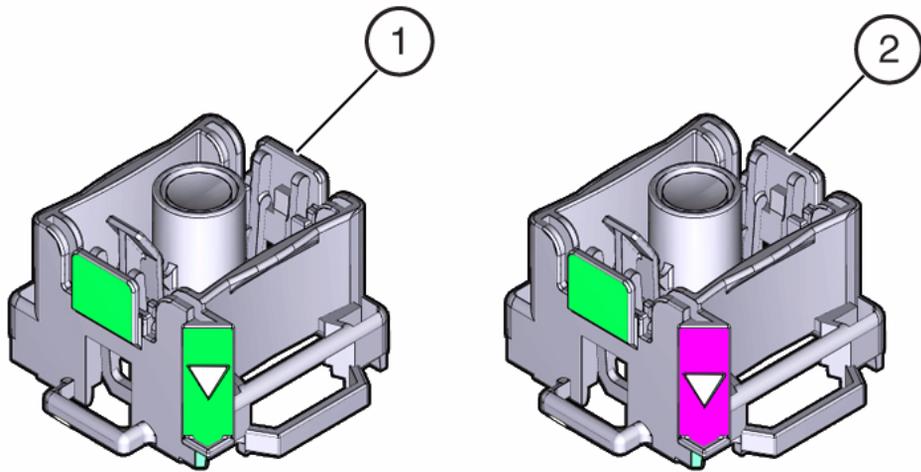
Figure Legend

1	Green, color-coded removal/replacement tool for the smaller processors—models E5-2609 V2 (4-core), E5-2630 V2 (6-core), E5-2650 V2 (8-core), and E5-2690 V2 (10-core)
2	Pink, color-coded removal/replacement tool for the larger processor—model E5-2697 V2 (12-core)

Caution – The pink color-coded processor removal/replacement tool must be used only with the larger processor (the 12-core processor). Likewise, the green color-coded removal/replacement tool must be used only with smaller processors (the 4-, 6-, 8-, and 10-core processors); otherwise, the processor or the processor socket might be damaged.

The following table provides an easy reference for matching a processor (by number of cores or model number) to the correct processor removal/replacement tool.

TABLE: Processor Model Numbers by Number of Cores

Processor Cores	Processor Model Number	Processor Removal/Replacement Tool Color Code
4-core	E5-2609 V2	Green
6-core	E5-2630 V2	
8-core	E5-2650 V2	
10-core	E5-2690 V2	
12-core	E5-2697 V2	Pink

Note – The correct processor removal/replacement tool is included in the box with the replacement processor. Additionally, both removal/replacement tools ship with replacement motherboards.

▼ Remove a Processor

⚠ **Caution –** Processors should be removed only by an Oracle qualified service technician.

⚠ **Caution –** Processor removal and replacement must be done using the correct removal/replacement tool; otherwise, damage might result to the processor or the processor socket. For information on how to select the correct removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

⚠ **Caution –** Be careful not to touch the processor socket pins. The processor socket pins are very fragile. A light touch can bend the processor socket pins and damage the board beyond repair. Always use the processor removal/replacement tool to remove and replace the processor.

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

   See "Powering Down the Server" on page 33.

b. **Extend the server to the maintenance position.**

   See "Extend the Server to the Maintenance Position" on page 39.

c. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42.

d. **Remove the server top cover.**

   "Remove the Server Top Cover" on page 43.

2. **Identify the location of the faulty processor by pressing the Fault Remind button on the motherboard.**

Note – When the Fault Remind button is pressed, a LED located next to the Fault Remind button lights green to indicate that there is sufficient voltage present in the fault remind circuit to light any fault LEDs that were lit due to a failure. If this LED fails to light when you press the Fault Remind button, it is likely that the capacitor powering the fault remind circuit has lost its charge. This can happen if the Fault Remind button is pressed for a long time with fault LEDs lit or if power has been removed from the server for more than 15 minutes.

The processor fault LEDs are located next to the processor(s).

- If the processor fault LED is off, then the processor is operating properly.

- If the processor fault LED is on (amber), then the processor is faulty and should be replaced.

Note – Processor 0 (P0) is on the left side when viewing the server from the front.

---
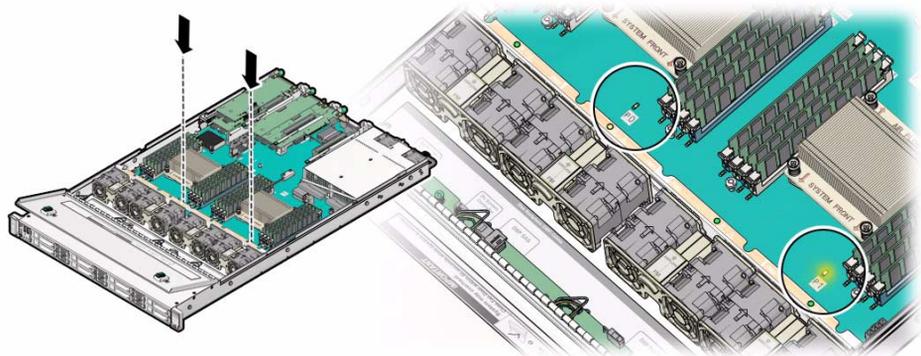
3. **Gently press down on the top of the heatsink to counteract the pressure of the captive spring-loaded screws that secure the heatsink to the motherboard and loosen the four Phillips captive screws in the heatsink for the processor [1].**

   Using a No. 2 Phillips screwdriver, turn the screws counterclockwise alternately one and one half turns until they are fully removed.
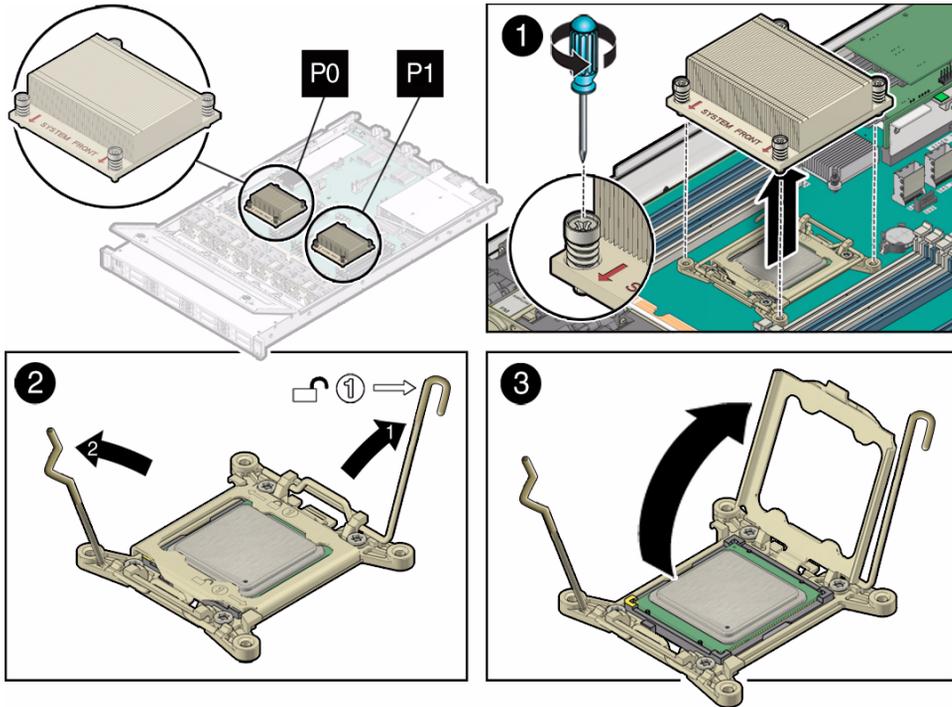
4. **To separate the heatsink from the top of the processor, gently twist the heatsink left and right, while pulling upward, and then lift off the heatsink and place it upside down on a flat surface [1].**

   A thin layer of thermal grease separates the heatsink and the processor. This grease acts as an adhesive.

Note – Do not allow the thermal grease to contaminate the work space or other components.

---

5. **Use an alcohol pad to clean the thermal grease from the underside of the heatsink.**

   Be careful not to get the thermal grease on your fingers.

Caution – Failure to clean the heatsink prior to removing the processor could result in the accidental contamination of the processor socket or other components. Also, be careful not to get the grease on your fingers as this could result in contamination of components.

6. **Disengage the processor ILM assembly hinge lever on the right side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [2].**

7. **Disengage the processor ILM assembly load lever on the left side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [2].**

8. **To lift the processor ILM assembly load plate off of the processor socket, rotate the ILM hinge lever on the right side of the processor toward the closed position (the ILM load plate is lifted up as the hinge lever is lowered toward the closed position) and carefully swing the ILM load plate to the fully open position [3].**

Caution – Whenever you remove a processor, you should replace it with another processor and reinstall the processor heatsink; otherwise, the server might overheat due to improper airflow. For instructions for installing a processor, see "Install a Processor" on page 112.

9. **To remove the processor from the processor socket, acquire the correct processor removal/replacement tool and perform the following steps:**

Caution – Before removing the processor, ensure that you are using the correct color-coded processor removal/replacement tool. For information on how to select the correct processor removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

a. **Locate the button in the center of the top of the processor removal/replacement tool and press it to the down position (see** FIGURE: Removing a Processor on page 111 **[1]).**

b. **Properly position the tool over the processor socket and lower it into place over the processor socket [2].**

To properly position the tool over the processor socket, rotate the tool until the green or pink triangle (depending on which color-coded tool is being used) on the side of the tool is facing the front of the server and it is over the left side of the processor socket when viewing the server from the front.

c. **Press the release lever on the tool to release the center button and engage the processor [3].**

An audible click indicates that the processor is engaged.

d. **Grasp the tool by the sides and remove it from the server [4].**

e. **Turn the tool upside down and verify that it contains the processor [5].**

f. **While holding the processor tool up side down, press the center button on the tool to release the processor [5].**

g. **Carefully grasp the processor by the front and back edges, lift it out of the tool and place it with the circuit side down (the installed orientation) on a clean antistatic mat [6].**

⚠ **Caution –** Ensure that the antistatic mat is clean and free of debris; otherwise, the processor pins might be damaged.

h. **Carefully clean the thermal grease off the top of the processor.**

⚠ **Caution –** The following figure shows the green color-coded processor removal/replacement tool. If you are removing a 12-core processor, you must use the pink color-coded processor removal/replacement tool; otherwise, damage might result to the processor or the processor socket. For information on how to select the correct processor removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

Removing a Processor
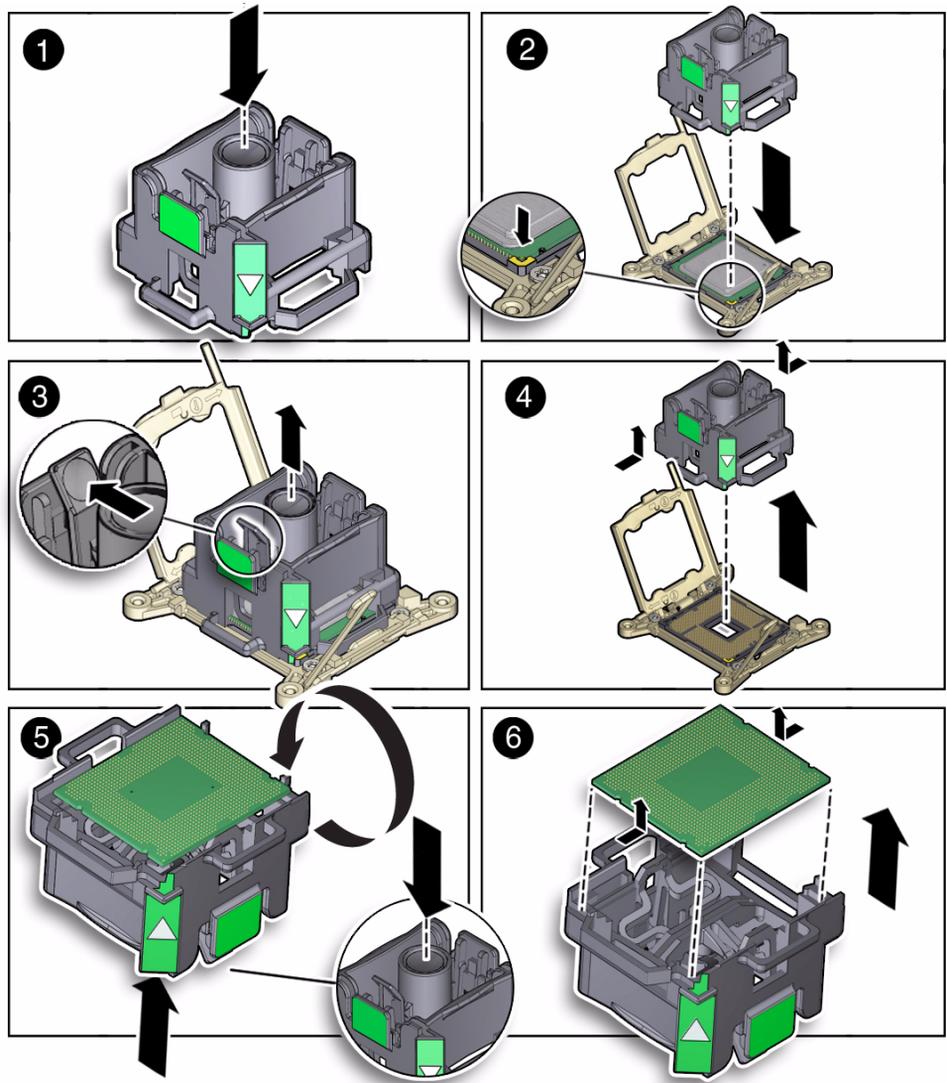
Related Information

- "Install a Processor" on page 112

▼ Install a Processor

⚠ **Caution –** Processors should be installed only by an Oracle qualified service technician.

⚠ **Caution –** Processor removal and replacement must be done using the correct removal/replacement tool; otherwise, damage might result to the processor or the processor socket. For information on how to select the correct removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

⚠ **Caution –** Be careful not to touch the processor socket pins. The processor socket pins are very fragile. A light touch can bend the processor socket pins and damage the board beyond repair. Always use the processor removal/replacement tool to remove and replace the processor.

1. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42.

2. **Unpack the replacement processor and place it on an antistatic mat.**

3. **Ensure that the replacement processor is identical to the processor that was removed.**

   For a description of the processors supported by the server, see the *Sun Server X4-2 Installation Guide,* "Server Components" on page 20.

4. **Ensure that the two processor ILM assembly levers and the ILM assembly load plate are in the fully open position.**

   For instructions for opening the processor ILM assembly levers and the load plate, see Step 6 through Step 8 of "Remove a Processor" on page 106.

5. **To install the replacement processor into the processor removal/replacement tool, acquire the correct removal/replacement tool and perform the following steps:**

⚠ **Caution –** Before installing the processor, ensure that you are using the correct color-coded processor removal/replacement tool. For information on how to select the correct processor removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

a. **Press the button in the center of the tool to the down position (see** FIGURE: Installing a Processor on page 114 **[1]).**

b. **Turn the tool upside down, grasp the processor by its front an back edges and position the processor (circuit side up) in the tool so that the triangle on the corner of the processor aligns with the triangle on the side of the processor removal/replacement tool [2].**

c. **Lower the processor into the tool and press the tool release lever to release the center button and engage the processor [3].**

   An audible click indicates that the processor is locked in place.

d. **Properly position the tool over the processor socket and lower it into place [4].**

   To properly position the tool in the processor socket, rotate the tool until the green or pink triangle (depending on which color-coded tool is being used) on the side of the tool is facing the front of the server and it is over the left side of the processor socket (when viewing the server from the front) and lower the tool into the processor socket.

e. **Press the center button in the tool down to release the processor so that it is installed in the socket [5].**

f. **Remove the processor removal/replacement tool [6].**

Caution – The following figure shows the green color-coded processor removal/replacement tool. If you are installing a 12-core processor, you must use the pink color-coded processor removal/replacement tool; otherwise, damage might result to the processor or the processor socket. For information on how to select the correct processor removal/replacement tool, see "Selecting the Correct Processor Removal/Replacement Tool" on page 102.

FIGURE: Installing a Processor
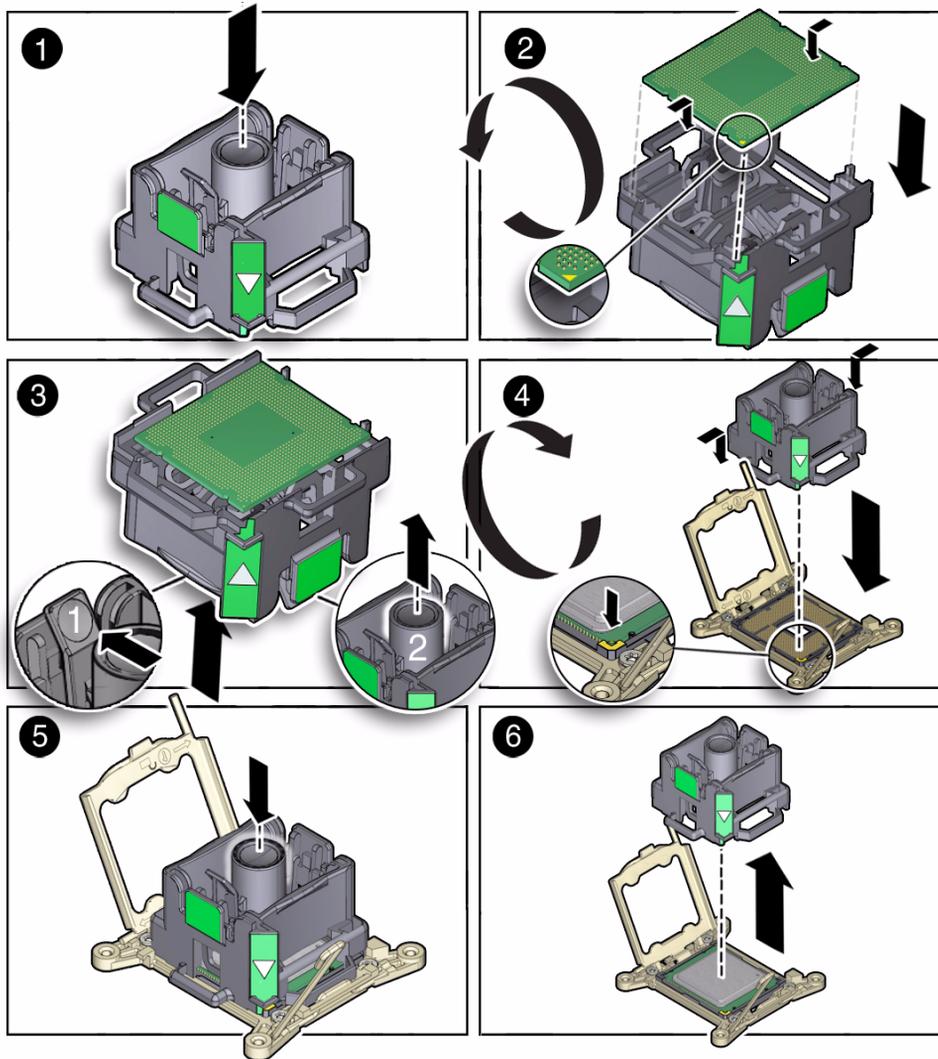
6. **Visually check the alignment of the processor in the socket.**

   When properly aligned, the processor sits flat in the processor socket.

⚠ **Caution –** Do not press down on the processor. Irreparable damage to the processor or motherboard might occur from excessive downward pressure. Do not forcibly seat the processor into the socket. Excessive downward pressure might damage the socket pins.

7. **Swing the processor ILM assembly load plate into the closed position [1].**

Ensure that the load plate sits flat around the periphery of the processor.
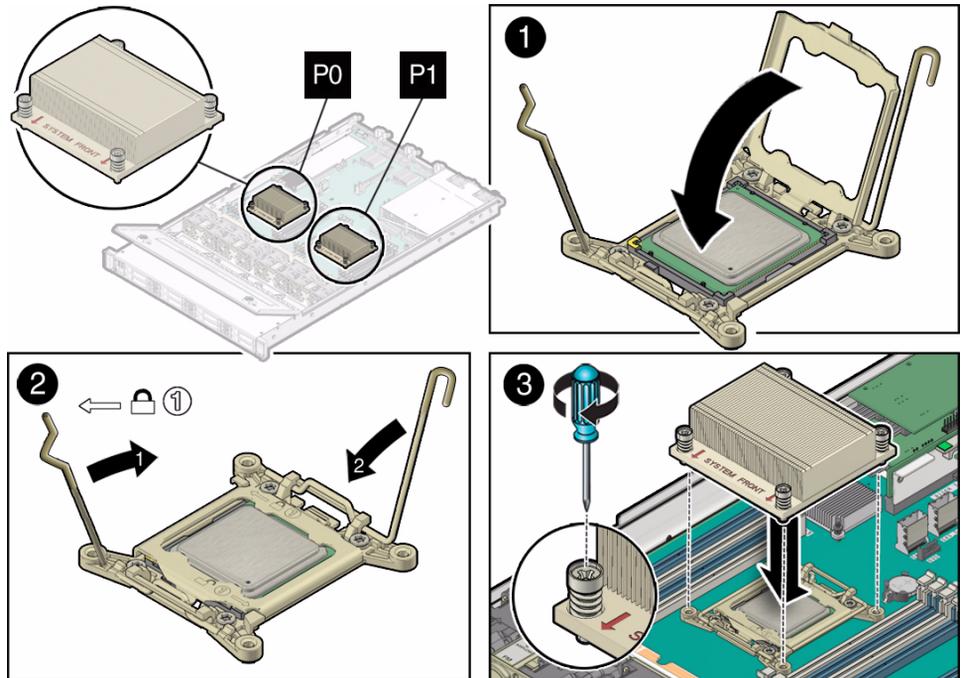
8. **Engage the processor ILM assembly load lever on the left side of the socket (viewing the server from the front) by rotating it downward and slipping it under the catch [2].**

9. **Engage the processor ILM assembly hinge lever on the right side of the socket (viewing the server from the front) by rotating it downward and slipping it under the catch [2].**

10. **Use the syringe (supplied with the new or replacement processor) to apply approximately 0.1 ml of thermal grease to the center of the top of the processor.**

To measure 0.1 ml of thermal grease, use the graduated scale on the thermal grease syringe.

Note – Do not distribute the grease; the pressure of the heatsink will do so for you when you install it.

---

11. **Inspect the heatsink for dust and lint.**

Clean the heatsink if necessary.

12. Orient the heatsink so that the screws line up with the mounting posts [3].

Note – The processor heatsink is not symmetrical.

---

13. Carefully position the heatsink on the processor, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease [3].

Caution – Avoid moving the heatsink after it has contacted the top of the processor. Too much movement could disturb the layer of thermal grease, causing voids, and leading to ineffective heat dissipation and component damage.

---

14. Tighten the four Phillips screws with a No. 2 Phillips screwdriver alternately one-half turn until fully seated.

15. Return the server to operation.

   a. Install the server top cover.

   See "Install the Server Top Cover" on page 145.

   b. Close the server fan door.

   c. Return the server to the normal rack position.

   See "Return the Server to the Normal Rack Position" on page 148.

   d. Reconnect the data cables and reconnect the power cords to the server power supplies.

   See "Reconnect Data Cables and Power Cords" on page 149.

   e. Power on the server.

   See "Power On the Server" on page 150.

   Verify that the Power/OK status indicator is steady on.

16. Use Oracle ILOM to clear server processor faults.

Refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library for more information about the following steps.

a. **To show server faults, log in to the server as root using the Oracle ILOM CLI, and type the following command to list all known faults on the server:**

-> **show /PS/faultmgmt**

The server lists all known faults, for example:

```
-> show /PS/faultmgmt
Targets:
    0 (/SYS/MB/P0)
Properties:
Commands:
    cd
    show
```

Alternatively, to list all known faults in the server, log into the Oracle Solaris OS and issue the fmadm faulty command, or log into the Oracle ILOM service processor from the Oracle ILOM Fault Management Shell and issue the fmadm faulty command.

b. **To clear the fault identified in Step 16.a, type the following command:**

-> **set /System/MB/P0 clear_fault_action=true**

For example:

```
-> set /System/MB/P0 clear_fault_action=true
Are you sure you want to clear /SYS/MB/P0 9y/n)? y
Set 'clear_fault_action' to 'true'
```

Alternatively, to clear all known faults in the server, log into the Oracle Solaris OS and issue the fmadm repair command, or log into the Oracle ILOM service processor from the Oracle ILOM Fault Management Shell and issue the fmadm repair command.

Related Information

- "Remove a Processor" on page 106

Servicing the Disk Backplane (FRU)

This section describes how to remove and install a disk backplane.

In addition to the service procedures included here, you can see animations that show how to remove and install a disk backplane.

PLAY the ANIMATION

To play the Sun Server X4-2 Service Animations go to:
http://docs.oracle.com/cd/E36975_01/html/E49470/index.html

Caution – Ensure that all power is removed from the server before removing or installing a disk backplane. You must disconnect the power cables from the server before performing these procedures.

- "Disk Backplane Configurations" on page 118
- "Remove the Disk Backplane" on page 119
- "Install the Disk Backplane" on page 122

Related Information

- "Disconnect Cables From the Server" on page 39
- "Take Antistatic Measures" on page 42
- "Extend the Server to the Maintenance Position" on page 39
- "Open the Server Fan Door" on page 43

Disk Backplane Configurations

The server has one or two disk backplanes depending on the number of storage drives installed. On servers with four or fewer storage drives, only one disk backplane is needed. Servers with five or more storage drives require two disk backplanes. The following figure shows a configuration with two disk backplanes, DBP0 and DBP1. Storage drives 0 through 3 plug into DBP0. Storage drives 4 through 7 plug into DBP1.

FIGURE: Disk Backplane Configurations
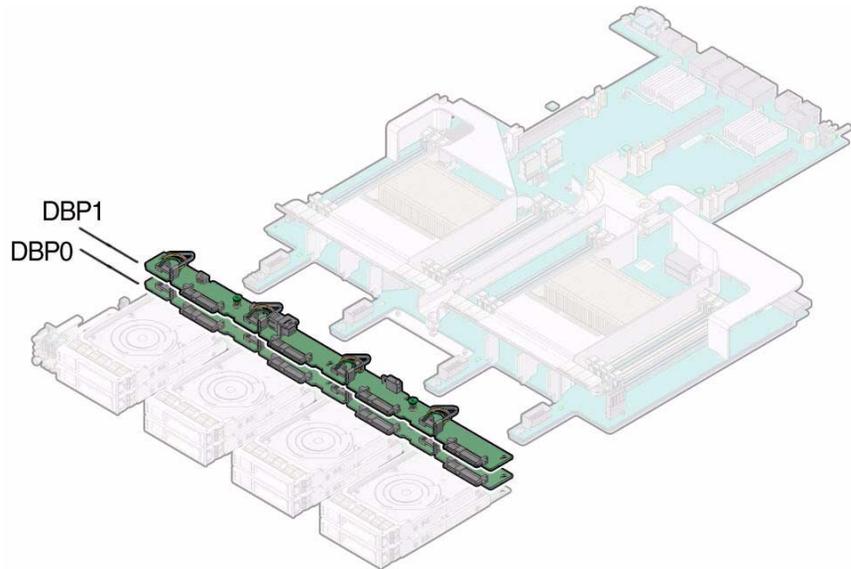
▼ Remove the Disk Backplane

Note – A server with four or fewer storage drives has only one disk backplane.

---

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33.

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Open the server fan door to gain access to the disk backplanes.**

2. **Pull each storage drive out far enough to disengage it from the disk backplane.**

   See "Remove a Storage Drive" on page 47.

Note – It is not necessary to completely remove the storage drives from the server; simply pull them out far enough to disengage them from the disk backplane. If you do remove the storage drives from the server, make a note of their locations so that you can reinstall them in the same locations.

3. **Remove all four fan modules.**

   See "Remove a Fan Module" on page 51.

4. **Starting with the top disk backplane if servicing a server with two disk backplanes, disconnect the SAS cable from each disk backplane [1].**

   See FIGURE: Removing the Disk Backplane on page 121.

Note – If you are going to remove and replace both disk backplanes, before disconnecting any backplane cables, make a note of, or tag, which cables connect to the top disk backplane and which cables connect to the bottom disk backplane for reference when you install the replacement disk backplanes.

FIGURE: Removing the Disk Backplane
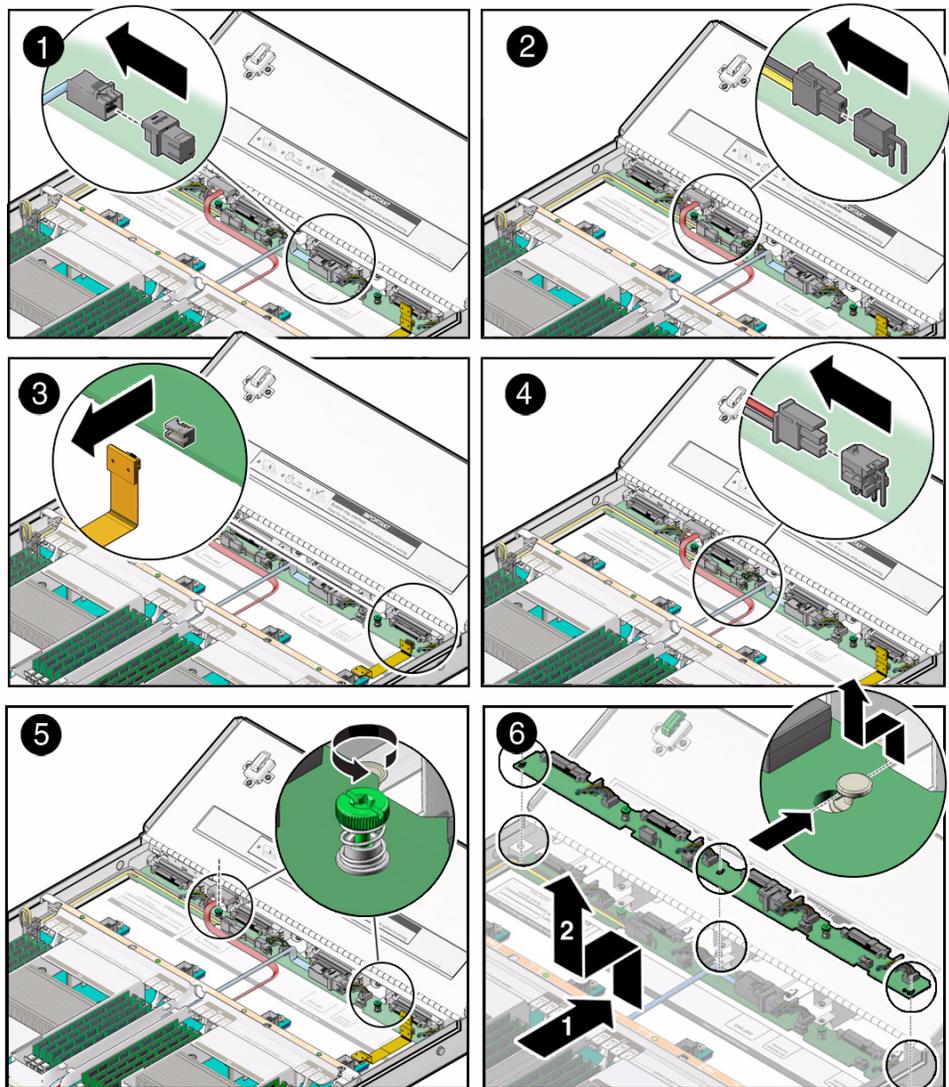
5. **Disconnect the disk backplane power cable from the disk backplane [2].**

6. **Disconnect the disk backplane LED cable from the disk backplane [3].**

7. **If the server has a DVD drive, disconnect the DVD drive power cable from the disk backplane [4].**

Note – Servers with a DVD drive have only one disk backplane.

---

8. **Using just your thumb and fingers, loosen the two captive thumb screws that secure the disk backplane to the chassis [5].**

9. **Slide the backplane toward the front of the server to release it from the three mushroom-shaped standoffs and lift it out of the chassis [6].**

10. **Place the disk backplane on an antistatic mat.**

11. **If the server has a second disk backplane, repeat** Step 4 **through** Step 10 **to remove it.**

Related Information

■ "Install the Disk Backplane" on page 122

▼ Install the Disk Backplane

1. **Starting with the bottom disk backplane if servicing a server with two disk backplanes, lower the backplane into the server and position it to engage the three mushroom-shaped standoffs [1].**

FIGURE: Installing the Disk Backplane
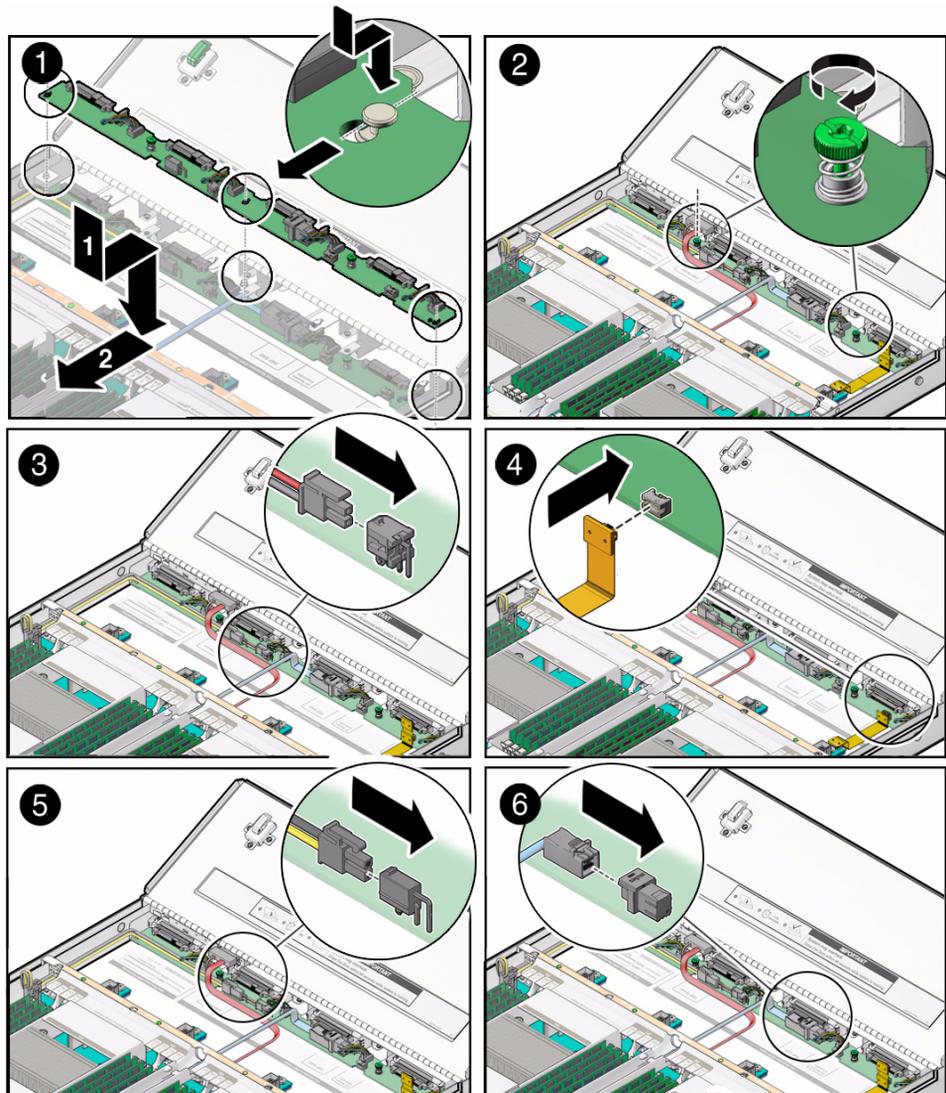
2. Using just your thumb and fingers, tighten the two captive thumb screws to secure the disk backplane to the chassis [2].

3. If the server has a DVD drive, reconnect the DVD drive power cable to the disk backplane [3].

4. Reconnect the disk backplane LED cable to the disk backplane [4].

5. Reconnect the disk backplane power cable to the disk backplane [5].

6. **Reconnect the SAS cable to the disk backplane [6].**

7. **If the server has more than four storage drives, repeat all of the preceding steps (with the exception of** Step 3**, which directs you to reconnect the DVD drive power cable) to install the second disk backplane.**

   A server that has two disk backplanes does not have a DVD drive installed.

8. **Reinstall all of the storage drives into the storage drive cage.**

   See "Install a Storage Drive" on page 49.

9. **Install all four fan modules.**

   See "Install a Fan Module" on page 54.

10. **Return the server to operation.**

    a. **Close the server fan door.**

    b. **Return the server to the normal rack position.**

       See "Return the Server to the Normal Rack Position" on page 148.

    c. **Reconnect the data cables to the server and reconnect the power cords to the server power supplies.**

       See "Reconnect Data Cables and Power Cords" on page 149.

    d. **Power on the server.**

       See "Power On the Server" on page 150.

       Verify that the Power/OK status indicator is steady on.

Note – **IMPORTANT:** After replacing disk backplane 0 (DBP0), you must manually program the product serial number (PSN) into the new disk backplane. This is necessary because DBP0 is the primary member of a select group of components for maintaining the PSN for service entitlement. On systems with two disk backplanes, disk backplane 1 (DBP1) does *not* have this requirement. To propagate the FRU top-level indicator (TLI) data to the new DBP0, you must reset the Oracle ILOM service processor (SP). For instructions on resetting the SP, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Configuration and Maintenance Guide at `http://www.oracle.com/goto/ILOM/docs`

Related Information

■ "Remove the Disk Backplane" on page 119

Servicing the Front Indicator Module (FRU)

Caution – Ensure that all power is removed from the server before removing or installing a front indicator module. You must disconnect the power cables from the server before performing these procedures.

Follow these procedures to remove and install the front indicator module (FIM).

- "Remove the Front Indicator Module" on page 125
- "Install the Front Indicator Module" on page 127

Related Information

- "Disconnect Cables From the Server" on page 39
- "Remove the Server From the Rack" on page 41
- "Take Antistatic Measures" on page 42
- "Open the Server Fan Door" on page 43

▼ Remove the Front Indicator Module

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33.

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

2. **To remove the top cover from the storage drive cage, do the following:**

   a. **Remove the six Phillips screws from the top of the storage drive cage [1].**

      There are three Phillips screws on each side of the storage drive cage.

b. Open the server fan door.

See "Open the Server Fan Door" on page 43.

c. To remove the storage drive cage cover, slide it forward (toward the front of the server) and lift it up.

3. Loosen the screw that secures the front indicator module (FIM) assembly to the server chassis [2].

FIGURE: Removing the Front Indictor Module
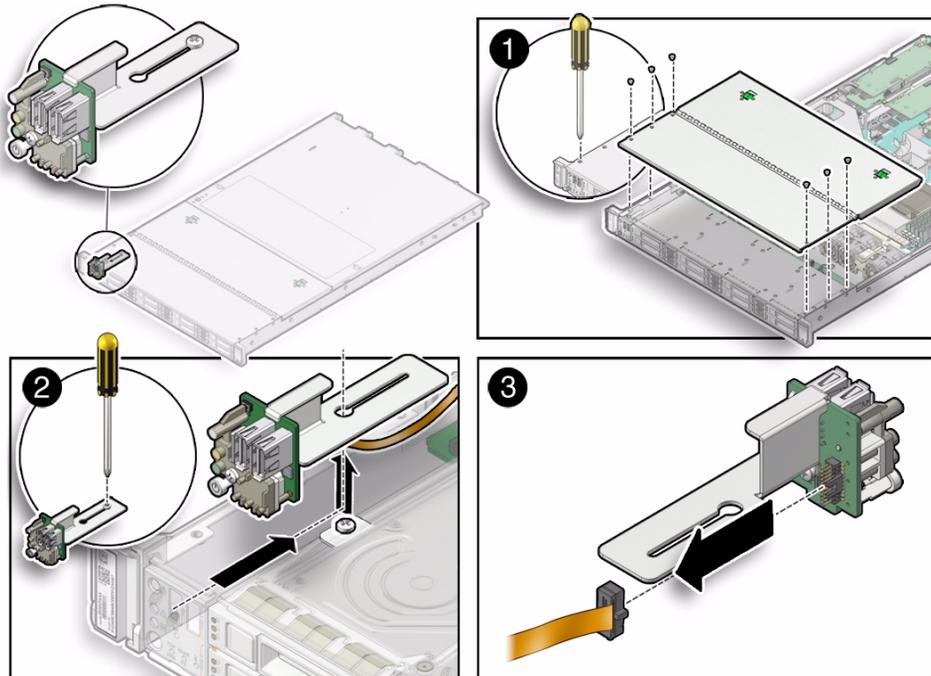
4. Carefully slide the FIM assembly toward the rear of the server enough to lift it over the Phillips screw and out of the server [2].

5. Disconnect the FIM cable from the FIM assembly and set the assembly aside [3].

6. Continue to "Install the Front Indicator Module" on page 127**.**

Related Information

- "Install the Front Indicator Module" on page 127

▼ Install the Front Indicator Module

1. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42

2. **Unpack the replacement FIM and place it on an antistatic mat.**

3. **Connect the FIM cable to the replacement FIM assembly [3].**

   See FIGURE: Removing the Front Indictor Module on page 126.

4. **Carefully lower the FIM assembly into the chassis, position it over the Phillips screw in the server chassis, and slide it forward so all the LEDs, USB connectors, and Power On button fit into place on the server front panel [2].**

5. **Tighten the Phillips screw to secure the FIM assembly to the server chassis [2].**

6. **Place the storage drive cage cover over the server storage drive cage and install the six Phillips screws to secure the cover to the server.**

   There are three Phillips screws on each side of the storage drive cage.

7. **Ensure that server fan door is closed.**

8. **Return the server to operation.**

   a. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   b. **Reconnect the data cables to the server and reconnect the power cords to the server power supplies.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   c. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

Related Information

- "Remove the Front Indicator Module" on page 125

Servicing the Motherboard (FRU)

Follow these procedures to remove and install the motherboard.

Caution – The motherboard should be serviced only by an Oracle qualified service technician.

Caution – Ensure that all power is removed from the server before removing or installing the motherboard. You must disconnect the power cables before performing these procedures.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 42.

- "Remove the Motherboard" on page 128
- "Install the Motherboard" on page 135

Related Information

- "Remove the Server From the Rack" on page 41
- "Take Antistatic Measures" on page 42
- "Remove the Server Top Cover" on page 43

▼ Remove the Motherboard

Caution – The motherboard should be serviced only by an Oracle qualified service technician.

Caution – Use the Oracle ILOM backup utility prior to removing the motherboard. This utility backs up the Oracle ILOM configuration of the service processor. For more information, see the Oracle ILOM 3.1 Documentation Library at http://www.oracle.com/goto/ILOM/docs.

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

   See "Powering Down the Server" on page 33.

b. **Extend the server to the maintenance position.**

   See "Extend the Server to the Maintenance Position" on page 39.

c. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42.

d. **Remove the server top cover.**

   See "Remove the Server Top Cover" on page 43.

2. **Remove the following reusable components:**

![caution icon] **Caution –** During the motherboard removal procedure, it is important to label the power supplies with the slot numbers from which they were removed (PS0, PS1). This is required because the power supplies must be reinstalled into the same slots from which they were removed; otherwise, the server FRU top-level indicator (TLI) data might be lost. When a server requires service, the FRU TLI is used by Oracle to verify that the warranty on the server has not expired. For more information on the server FRU TLI, see "FRU TLI Auto-Update" on page 30.

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a. **Fan modules**

   For instructions, see "Remove a Fan Module" on page 51.

b. **Power supplies**

   For instructions, see "Remove a Power Supply" on page 57.

c. **PCIe risers and attached PCIe cards**

   For instructions, see "Servicing PCIe Risers (CRU)" on page 74.

3. **Disconnect the disk backplane power cable from the motherboard [1].**
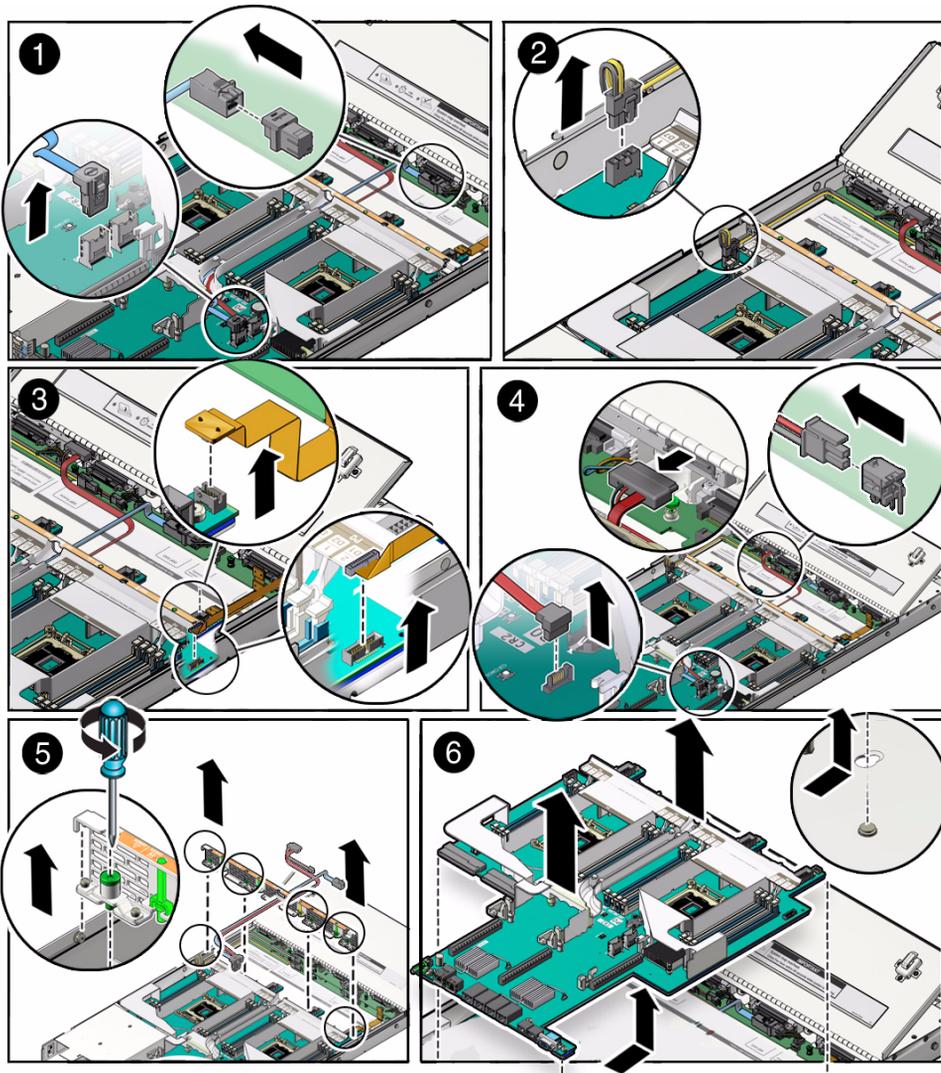
4. Disconnect the disk backplane LED cable from the motherboard [2].

5. Disconnect the front indicator module (FIM) cable from the motherboard [3].

6. If the server has a DVD drive, do the following:

   a. Disconnect the DVD drive cable from the motherboard [4].

   b. Carefully lift the DVD drive cable out of the cable trough.

7. **Disconnect the SAS cables from the internal HBA, and then carefully lift the SAS cables that you disconnected from the internal HBA out of the cable trough.**

8. **Remove the server mid-wall [5].**

   a. **Using a No. 2 Phillips screwdriver, loosen the four green captive screws that secure the mid-wall to the server chassis.**

   b. **Lift the mid-wall up slightly and pull in toward the front of the server to disengage it from the raised mushroom-shaped standoffs that are located on the server chassis sidewall (one on each end of the mid-wall).**

   c. **Place the mid-wall, DVD cable, and SAS cables toward the front of the server and out of the way of the motherboard.**

9. **Remove the motherboard from the server chassis [6].**

   a. **Grasp the middle of the air duct in the front and back and slide the motherboard toward the front of the server and lift it slightly to disengage it from the six mushroom-shaped standoffs that are located on the server chassis under the motherboard [6].**

   b. **Lift the motherboard out of the server chassis and place it on an antistatic mat, and next to the replacement motherboard [6].**

10. **Remove the internal USB flash drives from the motherboard and install them on the replacement motherboard.**

    For instructions, see "Servicing the Internal USB Flash Drives (CRU)" on page 94.

11. **Remove the DDR3 DIMMs from the motherboard and install them on the replacement motherboard.**

    For instructions, see "Servicing the DIMMs (CRU)" on page 62.

Note – Install the DDR3 DIMMs only in the sockets (connectors) that correspond to the sockets from which they were removed. Performing a one-to-one replacement of the DIMMs significantly reduces the possibility that the DIMMs will be installed in the wrong sockets. If you do not reinstall the DIMMs in the same sockets, server performance might suffer and some DIMMs might not be used by the server.

---

12. **Remove the processors from the faulty motherboard.**

    For instructions, see "Remove a Processor" on page 106.

13. **Remove the processor socket covers from the replacement motherboard and install the processors.**

a. **Disengage the processor ILM assembly hinge lever on the right side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [Frame 1].**
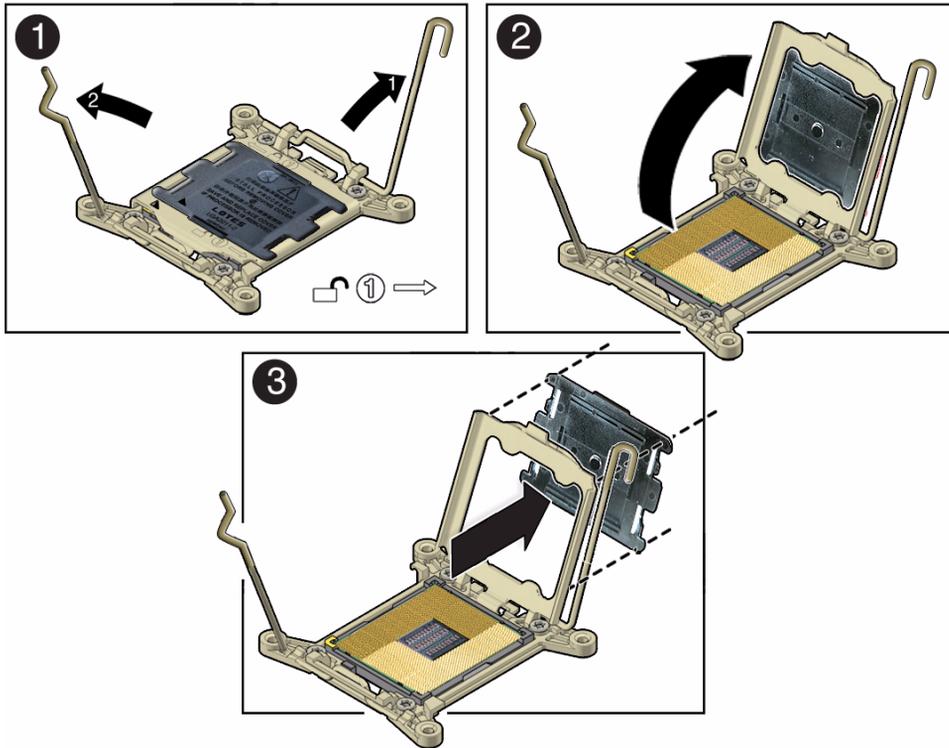
b. **Disengage the processor ILM assembly load lever on the left side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [1].**

c. **To lift the processor ILM assembly load plate off of the processor socket, rotate the ILM assembly hinge lever on the right side of the processor toward the closed position (the load plate is lifted up as the hinge lever is lowered) and carefully swing the load plate to the fully open position [2].**

d. **Grasp the top and underside of the processor socket cover with one hand (place your thumb against the underside of the cover), place your other thumb against the underside of the cover, and carefully push the cover out of the processor ILM assembly load plate [3].**

Caution – Be careful not to allow the processor socket cover to fall into the processor socket as this could result in damage to the socket.

   e. **Install a processor into the socket from which you removed the processor socket cover.**

     For instructions for installing a processor, see "Install a Processor" on page 112.

   f. **Repeat** Step a **through** Step e **above to remove the second processor socket cover from the replacement motherboard and install the second processor.**

14. **Install the processor socket covers on the faulty motherboard.**

Caution – The processor socket covers must be installed on the faulty motherboard; otherwise, damage might result to the processor sockets during handling and shipping.

Caution – Be careful not to allow the processor socket cover to fall into the processor socket as this could result in damage to the socket.

   a. **Open one of the processor ILM assemblies on the faulty motherboard [Frames 1 and 2].**
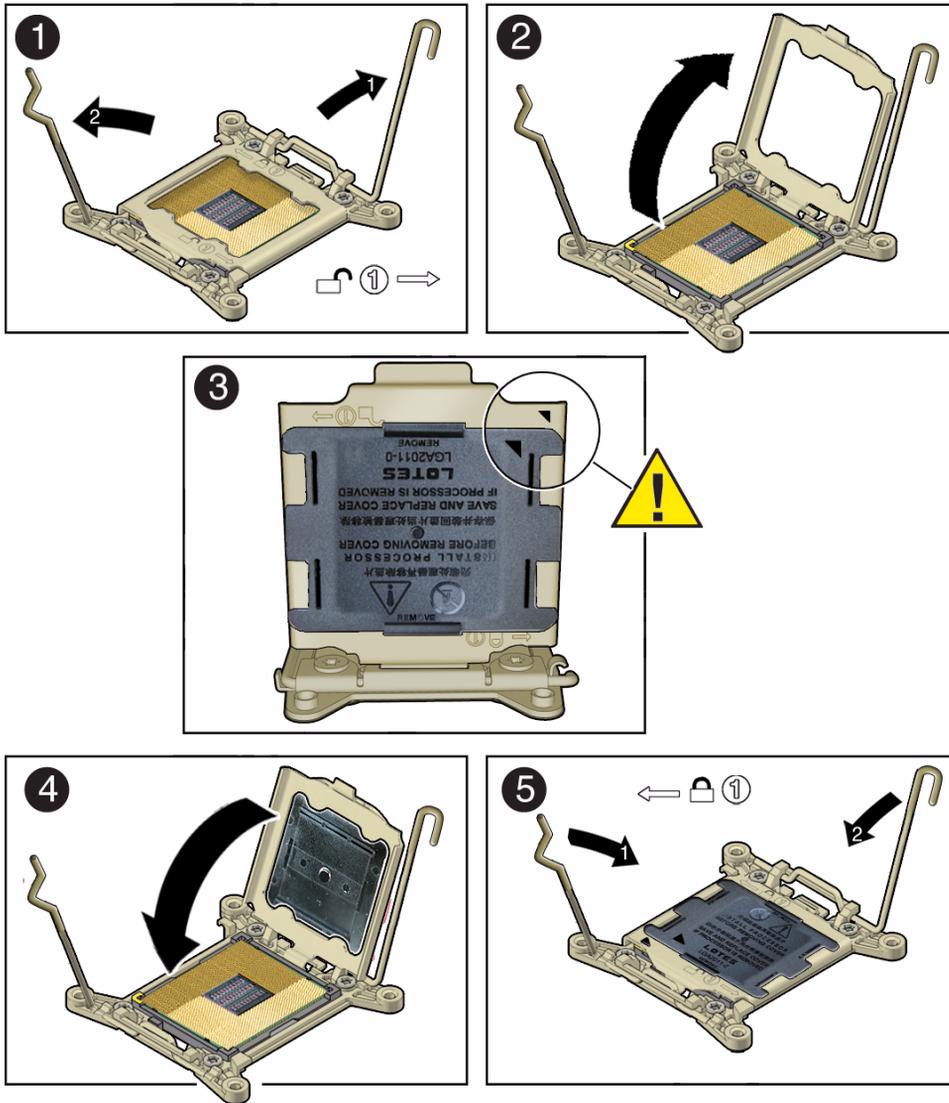
b. **Hold the processor ILM assembly load plate open with one hand and position the processor socket cover over the top of the load plate so that 1) the arrow on the processor socket cover is aligned with the arrow on the load plate and 2) the fasteners on one side of the cover (the fasteners are located on the underside of the cover) are inside the load plate (it does not matter which side), and use your thumb to press the other side of the processor socket cover into the load plate. [3].**

You will hear a clicking sound when the processor socket cover snaps into place.

c. **Close the processor ILM assembly load plate [4 and 5].**

d. **Repeat** Step a **through** Step c **above to install the second processor socket cover on the faulty motherboard.**

Related Information

- "Install the Motherboard" on page 135

▼ Install the Motherboard

⚠️ **Caution –** The motherboard should be installed only by an Oracle qualified service technician.

1. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

   See "Take Antistatic Measures" on page 42.

2. **Install the motherboard into the server chassis [1].**

   a. **To install the motherboard into the server, grasp the middle of the air duct in the front and back and tilt the front of the motherboard up slightly and push it into the opening in the rear of the server chassis [1].**

   b. **Lower the motherboard into the server chassis and slide it to the rear until it engages the six mushroom-shaped standoffs located on the server chassis under the motherboard [1].**
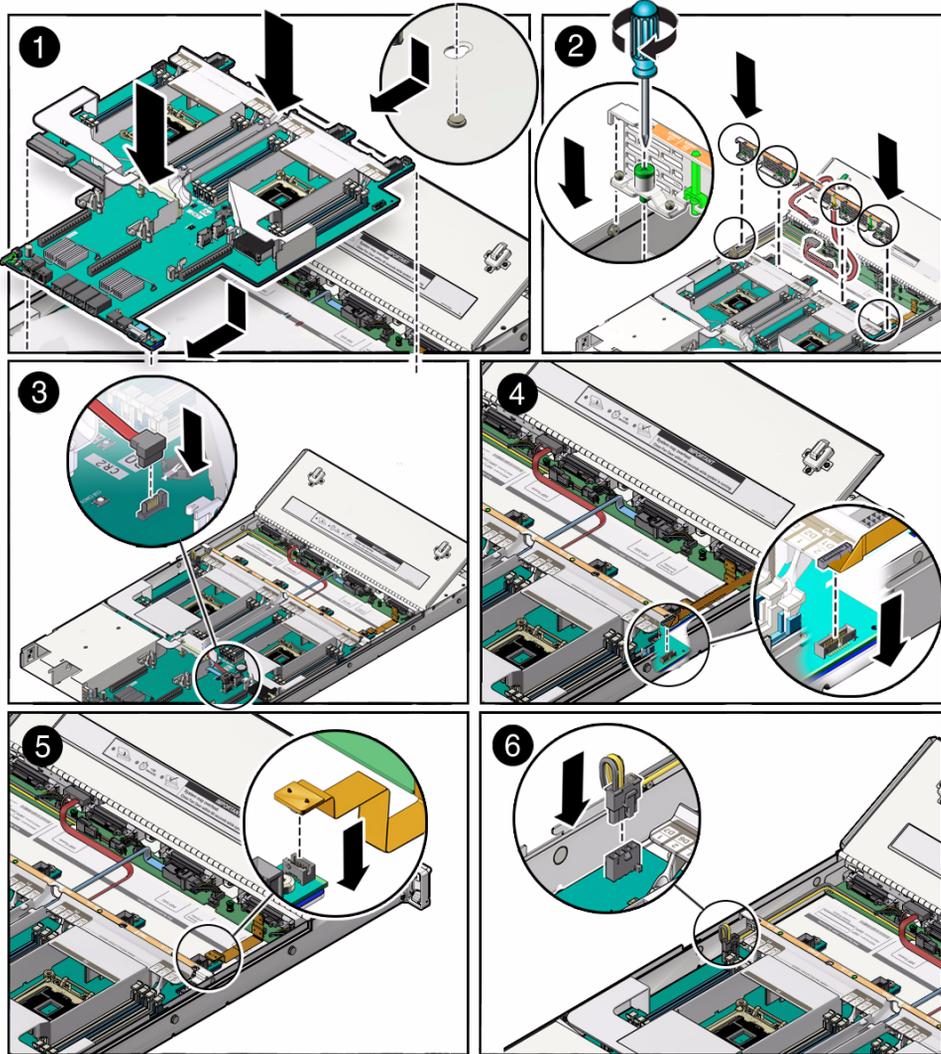
c. Ensure that the indicators, controls, and connectors on the rear of the motherboard fit correctly into the rear of the server chassis.

3. Install the server mid-wall [2].

   a. Ensure that the cables (SAS and DVD cable, if applicable) are running through the opening in the center of the mid-wall.

   b. Position the mid-wall with the cables in front of the motherboard so that it engages the mushroom-shaped standoffs that are located on the server chassis sidewall (one for each side of the mid-wall).

c. Place the FIM cable and the disk backplane power cable alongside the mid-wall next to their respective motherboard connectors.

d. Ensure that FIM cable and the disk backplane power cable are not pinched by the mid-wall and that they run beside the mid-wall and not under it; otherwise, the cables might be damaged.

e. To secure the mid-wall to the server chassis, tighten the four green captive screws.

4. Carefully place the SAS cable(s) that you disconnected from the internal HBA into the cable trough provided by the air duct on the motherboard.

5. If the server has a DVD drive, carefully place the DVD drive cable into the cable trough provided by the air duct on the motherboard.

6. If the server has a DVD drive, reconnect the DVD drive cable to the motherboard [3].

7. Reconnect the front indicator module (FIM) cable to the motherboard [4].

8. Reconnect the disk backplane LED cable to the motherboard [5].

9. Reconnect the disk backplane power cable to the motherboard [6].

10. Reinstall the following reusable components:

    a. PCIe risers and attached PCIe cards

    For instructions, see "Servicing PCIe Risers (CRU)" on page 74.

    b. Power supplies

Caution – When reinstalling power supplies, it is important to reinstall them into the slots from which they were removed during the motherboard removal procedure; otherwise, the server FRU top-level indicator (TLI) data might be lost. When a server requires service, the FRU TLI is used by Oracle to verify that the warranty on the server has not expired. For more information on the server FRU TLI, see "FRU TLI Auto-Update" on page 30.

    For instructions, see "Install a Power Supply" on page 59.

    c. Fan modules

    For instructions, see "Install a Fan Module" on page 54.

11. Return the server to operation.

    a. Install the server top cover.

    See "Install the Server Top Cover" on page 145.

   b. Close the server fan door.

   c. Return the server to the normal rack position.

     See "Return the Server to the Normal Rack Position" on page 148.

   d. Reconnect the data cables to the server and reconnect the power cords to the server power supplies.

     See "Reconnect Data Cables and Power Cords" on page 149.

   e. Power on the server.

     See "Power On the Server" on page 150.

     Verify that the Power/OK status indicator is steady on.

Note – IMPORTANT: After replacing the motherboard, you might need to manually program the product serial number (PSN) into the new motherboard. This is necessary because the motherboard is a secondary member of a select group of components that maintain the PSN for service entitlement. If you have replaced more than one of the members of this select group during any given service procedure, a secondary group member might need to be programmed with the PSN. To propagate the FRU top-level indicator (TLI) data to the new motherboard, you must reset the Oracle ILOM service processor (SP). For instructions on resetting the SP, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Configuration and Maintenance Guide at `http://www.oracle.com/goto/ILOM/docs`

Related Information

■ "Remove the Motherboard" on page 128

Servicing the SAS Cables (FRUs)

Caution – The system supplies power to the cables even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the cables.

To remove and install cables, follow the procedures in these sections:

■ "Remove Storage Drive SAS Cables" on page 139
■ "Install Storage Drive SAS Cables" on page 141

Related Information

- "Extend the Server to the Maintenance Position" on page 39
- "Take Antistatic Measures" on page 42
- "Remove the Server Top Cover" on page 43

▼ Remove Storage Drive SAS Cables

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 33.

   b. **Extend the server to the maintenance position.**

      See "Extend the Server to the Maintenance Position" on page 39.

   c. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

      See "Take Antistatic Measures" on page 42.

   d. **Remove the server top cover.**

      See "Remove the Server Top Cover" on page 43.

2. **Remove all of the server fan modules.**

   See "Remove a Fan Module" on page 51.

3. **Remove the PCIe riser from PCIe slots 3 and 4.**

   See "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 80.

4. **If the server has two disk backplanes, do the following; otherwise, proceed to the next step.**

   a. **To disconnect the SAS cable from top disk backplane, press the latch, push in toward the connector, and then pull out to remove the cable [1].**

Note – Servers with four storage drives or fewer have only one disk backplane. Servers with more than four storage drives have two disk backplanes.

---

   b. **Remove the top disk backplane.**

      See "Remove the Disk Backplane" on page 119.

   c. **To disconnect the SAS cable from bottom disk backplane, press and hold the cable latch, push in toward the connector, and then pull out the cable [1].**
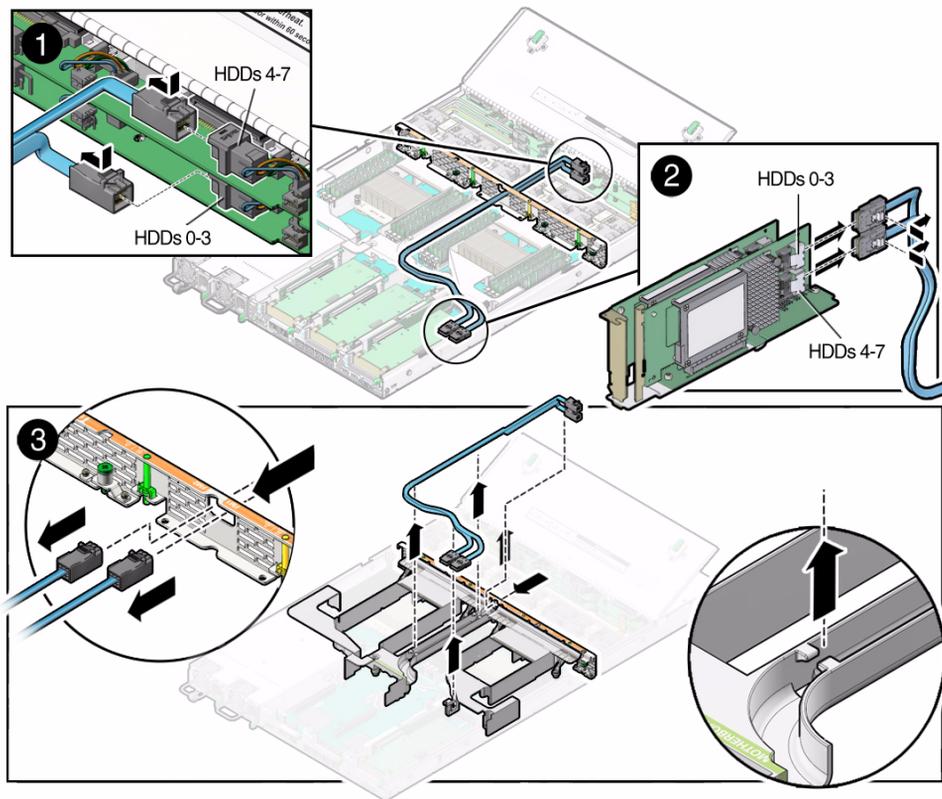
5. **If the server has only one disk backplane, to disconnect the cable from disk backplane, press and hold the cable latch, push in toward the connector, and then pull out the SAS cable [1].**

6. **Disconnect the SAS cable(s) from the internal host bus adapter (HBA) [2].**

   To disconnect the SAS cable(s) from the internal HBA card, press and hold the cable latches and then pull out the cables.

7. **Carefully remove the SAS cables from the trough in the air duct [3].**

8. **Carefully pull the internal SAS cables through the mid-wall and remove them from the chassis [3].**

Related Information

■ "Install Storage Drive SAS Cables" on page 141

▼ Install Storage Drive SAS Cables

1. **Properly orient the ends of the SAS cables to connect to the disk backplane and the HBA, respectively.**

2. **Carefully push the SAS cables through the mid-wall and place them into the cable trough in the middle of the air duct [1].**
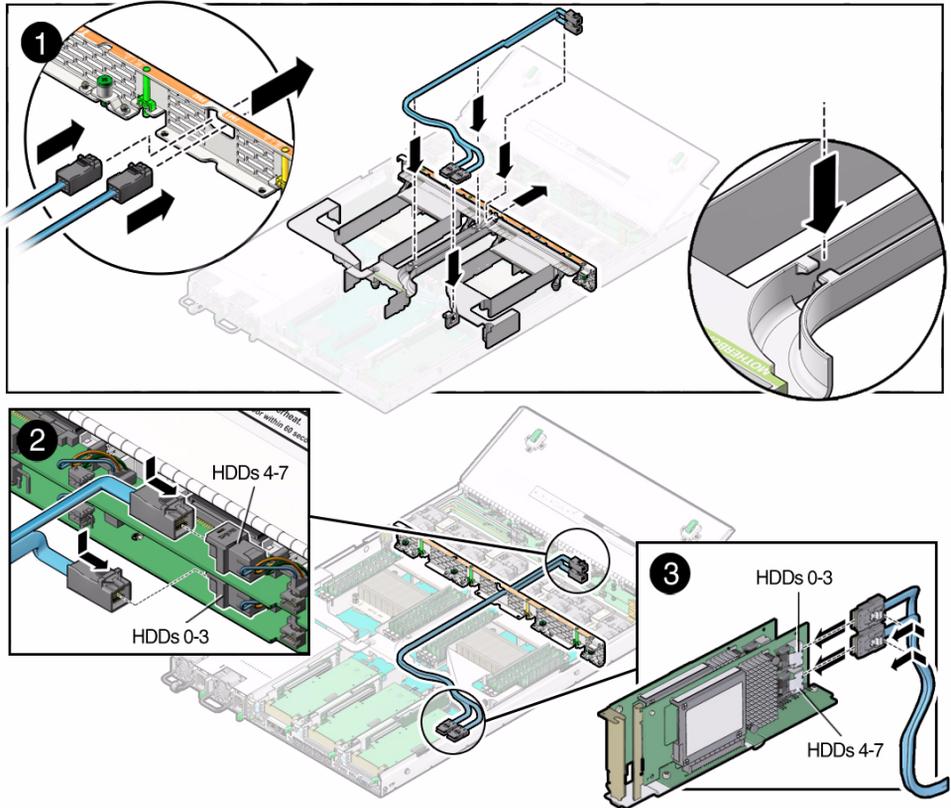
3. **Install the HDDs 0-3 cable.**

   a. **Install the HDDs 0-3 cable connector into the bottom disk backplane [2].**

   b. **Plug the HDDs 0-3 cable connector into the connector on the left side of the HBA card (the connector that is farthest from the power supplies) [3].**

4. **If the server has more than four storage drives, do the following:**

   a. **Install the top disk backplane.**

   See "Install the Disk Backplane" on page 122.

b. **Install the HDDs 4-7 cable connector into the top disk backplane [2].**

c. **Plug the HDDs 4-7 cable connector into the connector on the right side of the HBA card (the connector that is closest to the power supplies) [3].**

5. **Install the PCIe riser with the internal HBA card into PCIe slot 3.**

   See "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 82.

6. **Install all of the server fan modules.**

   See "Install a Fan Module" on page 54.

7. **Return the server to operation.**

   a. **Install the server top cover.**

      See "Install the Server Top Cover" on page 145.

   b. **Close the server fan door.**

   c. **Return the server to the normal rack position.**

      See "Return the Server to the Normal Rack Position" on page 148.

   d. **Reconnect the data cables to the server and reconnect the power cords to the server power supplies.**

      See "Reconnect Data Cables and Power Cords" on page 149.

   e. **Power on the server.**

      See "Power On the Server" on page 150.

      Verify that the Power/OK status indicator is steady on.

Related Information

- "Remove Storage Drive SAS Cables" on page 139

Returning the Server to Operation

After replacing components inside of the server, perform the procedures in the following sections.

Description	Links
Learn about filler panels.	"Removing and Installing Server Filler Panels" on page 143
Install the server top cover.	"Install the Server Top Cover" on page 145
Remove antistatic measures.	"Remove Antistatic Measures" on page 146
Install the server chassis into the rack.	"Reinstall the Server Chassis Into the Rack" on page 146
Return the server to the normal rack position.	"Return the Server to the Normal Rack Position" on page 148
Reconnecting data cables and power cords.	"Reconnect Data Cables and Power Cords" on page 149
Power on the server.	"Power On the Server" on page 150

Removing and Installing Server Filler Panels

Each server might be shipped with module-replacement filler panels for storage drives and PCIe cards. These filler panels are installed at the factory and must remain in the server until you replace them with a purchased option.

Before you can install an optional server component into the server, you must remove the filler panel from the location into which you intend to install the component. When you remove a storage drive or a PCIe card from the server, you must install either a replacement component or a filler panel.

See the following procedure for instructions for removing and installing the server filler panels:

- "Remove and Install Filler Panels" on page 144

Related Information

- "Servicing CRUs That Do Not Require Server Power-Off" on page 45
- "Servicing CRUs That Require Server Power-Off" on page 61

▼ Remove and Install Filler Panels

- **See the procedures in the following table to remove and install filler panels for storage drives and PCIe cards.**

Filler Panel Type	Removal Procedure	Installation Procedure
Storage Drive	1. Locate the storage drive filler panel to be removed from the server. 2. To unlatch the storage drive filler panel, press the release lever button, and then pull the lever out into a fully opened position. 3. To remove the filler panel from the slot, hold the opened release lever, and gently slide the filler panel toward you.	1. Locate the vacant storage drive module slot in the server, and then ensure that the release lever on the filler panel is fully opened. Slide the filler panel into the vacant slot by pressing the middle of the filler panel faceplate with your thumb or finger. 2. The release lever will 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

Filler Panel Type	Removal Procedure	Installation Procedure
PCI Slot	1. Remove the server top cover. 2. Remove the PCI slot filler panel from the location into which you intend to install the PCIe card. **Note:** In single-processor systems, PCIe slot 1 is nonfunctional; therefore, there is no need to remove the filler panel for slot 1.	1. Remove the server top cover. 2. Press the PCI filler panel into the vacant PCI slot. **Note:** In single-processor systems, PCIe slot 1 is nonfunctional; therefore, the server ships with this filler panel installed.

▼ Install the Server Top Cover

1. **Open the server fan door.**

   See "Open the Server Fan Door" on page 43.

2. **Place the top cover on the chassis [1].**

   Place the cover down so that it hangs over the rear of the server by about 13 mm (0.5 inches) and the side latches align with the slots in the sides of the chassis.

   Note – There are three latching tabs on the sides of the cover, two on the right side and one on the left side (viewing the server from the front). There is also a latch on the underside of the cover in the front left corner near the green release button.

3. **Check both sides of the chassis to ensure that the four corners of the top cover are fully down and flush with the chassis.**

   If the cover corners are not flush with the chassis, slide the cover towards the rear of the chassis until you can position the cover correctly.

   Caution – If the top cover is not correctly positioned before you attempt to slide the cover toward the front of the chassis, the internal latch that is located on the underside of the cover might be damaged.

4. **Gently slide the cover toward the front of the chassis until it locks into place (with an audible click) [2].**

   As you slide the cover toward the front of the server, watch the green release button. You will hear an audible click when the green release button pops up, indicating that the cover is locked.
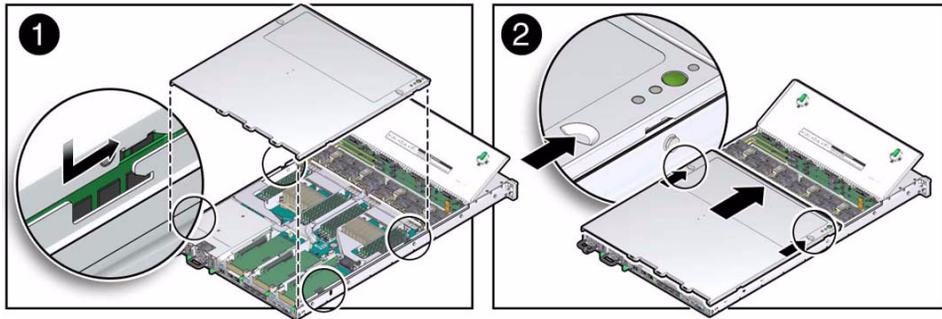
5. Close the server fan door.

6. Remove the antistatic precautions.

See "Remove Antistatic Measures" on page 146.

Related Information

- "Remove the Server Top Cover" on page 43
- "Remove Antistatic Measures" on page 146

▼ Remove Antistatic Measures

1. Remove any antistatic straps or conductors from the server chassis.

2. Remove the antistatic wrist strap from yourself.

▼ Reinstall the Server Chassis Into the Rack

If you removed the server chassis from the rack, perform these steps to reinstall it.

⚠ **Caution –** Deploy any rack anti-tilt mechanisms before installing the server into the rack.

Caution – The server weighs approximately 18.0 kg (40.0 lbs). Two people are required to carry the chassis and install it into the rack.

1. **Push the slide-rails into the slide-rail assemblies in the rack as far as possible.**

2. **Raise the server so that the rear ends of the mounting brackets are aligned with the slide-rail assemblies that are mounted in the rack.**

3. **Insert the mounting brackets into the slide-rails, and then push the server into the rack until the mounting brackets encounter the slide-rail stops, approximately 30 cm (12 inches).**

   The server is now in the extended maintenance position.

FIGURE: Returning the Server to the Rack
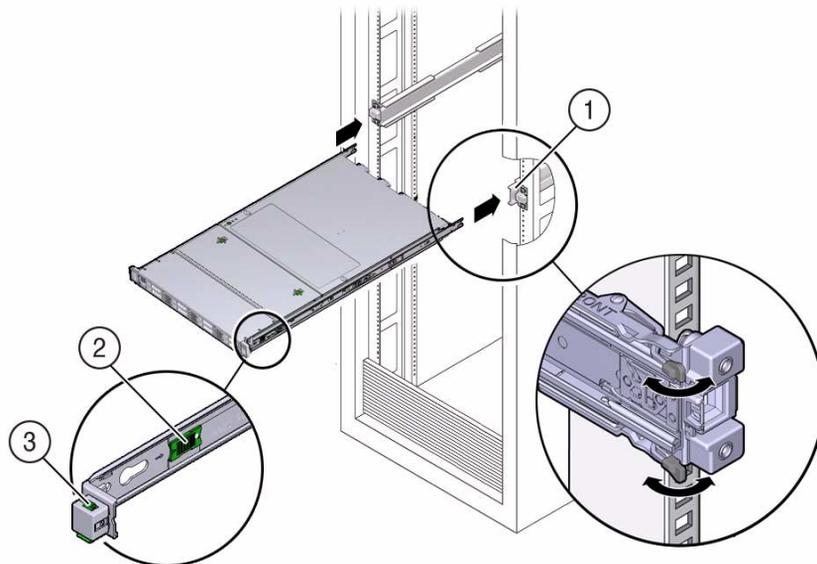
Figure Legend

1	Inserting mounting brackets into slide-rails
2	Slide-rail release tab (green)
3	Slide-rail lock

Related Information

- "Remove the Server From the Rack" on page 41
- "Remove Antistatic Measures" on page 146
- "Reconnect Data Cables and Power Cords" on page 149

▼ Return the Server to the Normal Rack Position

If the server is in the extended maintenance position, use this procedure to return the server to the normal rack position.

1. **Push the server back into the rack, as described in the following steps.**

   a. **Simultaneously pull and hold the two green release tabs (one on each side of of the server) toward the front of the server (see the following figure) while you push the server into the rack.**

   As you push the server into the rack, verify that the cable management arm (CMA) retracts without binding.

Note – To pull a green release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.

FIGURE: Location of the Release Tabs on the Slide-Rails

b. Continue pushing the server into the rack until the slide-rail locks (on the front of the server) engage the slide-rail assemblies.

   You will hear an audible click when the server is in the normal rack position.

2. **If the CMA is not installed, that is, you removed it because you removed the server completely out of the rack, install the CMA.**

   For installation instructions for the CMA, see one of the following procedures, depending on which version of the CMA is installed on your server:

   ■ *Sun Server X4-2 Installation Guide,* "Install the Second-Generation Cable Management Arm" on page 52

   ■ *Sun Server X4-2 Installation Guide,* "Install the First-Generation Cable Management Arm" on page 69

3. **If the cables are disconnected from the rear of the server, that is, you disconnected the cables because you removed the server completely out of the rack, reconnect the cables.**

   ■ For instructions on reconnecting cables to the rear of the server, see "Reconnect Data Cables and Power Cords" on page 149.

   ■ For detailed information on connecting cables to the rear of the server, see *Sun Server X4-2 Installation Guide,* "Rear Cable Connections and Ports" on page 77.

Related Information

■ "Reconnect Data Cables and Power Cords" on page 149

▼ Reconnect Data Cables and Power Cords

1. **Reconnect the data cables to the rear of the server, as required.**

   If the cable management arm (CMA) is in the way, extend the server approximately 13 cm (5 inches) out of the front of the rack.

2. **Reconnect the power cables to the power supplies and secure them with the Velcro straps as shown in the following figure.**

3. **If necessary, reinstall the cables into the CMA and secure them with Velcro straps or cable straps, depending on which version of the CMA you are using.**

4. **If you pulled the server out of the rack to make it easier to connect the cables, push the server into the rack until the slide-rail locks (on the front of the server) engage the slide-rail assemblies.**

   You will hear an audible click when the server is in the normal rack position.

Related Information

- "Disconnect Cables From the Server" on page 39
- "Reinstall the Server Chassis Into the Rack" on page 146
- "Power On the Server" on page 150

▼ Power On the Server

As soon as the power cords are connected, standby power is applied and the green Power/OK status indicator on the server front panel blinks. Depending on the configuration of the firmware, the system might boot. If not, complete this step:

● **Power on the server by performing one of the following:**

  ■ Press the Power button on the server front panel.

  ■ Log in to the Oracle ILOM web interface, click Host Management > Power Control and select Power On from the Select Action list.

  ■ Log in to the Oracle ILOM command-line interface (CLI), and type the following command at the Oracle ILOM CLI prompt.

```
-> start /System
```

When the server is powered on and the power-on self-test (POST) code checkpoint tests have completed, the green Power/OK status indicator on the front panel lights and remains lit.

Related Information

■ "Powering Down the Server" on page 33

■ "Reconnect Data Cables and Power Cords" on page 149

Identifying the Server Ports

This section describes the pinouts of the server connectors.

Description	Links
Learn about the Gigabit Ethernet ports.	"Gigabit Ethernet Ports" on page 153
Learn about the network management port.	"Network Management Port" on page 154
Learn about the serial management port.	"Serial Management Port" on page 155
Learn about the video connector.	"Video Connector" on page 157
Learn about USB ports.	"USB Ports" on page 158

Gigabit Ethernet Ports

The server has four auto-negotiating 100/1000/10,000BASE-T gigabit Ethernet (GbE) system domain ports. All four Ethernet ports use a standard RJ-45 connector.

The transfer rates are shown in the following table:

TABLE: Ethernet Port Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Fast Ethernet	100BASE-TX	100 Mbps
Gigabit Ethernet	1000BASE-T	1,000 Mbps
10 Gigabit Ethernet	10GBASE-T	10,000 Mbps

The following figure and table describe the 10-GbE port pin signals.
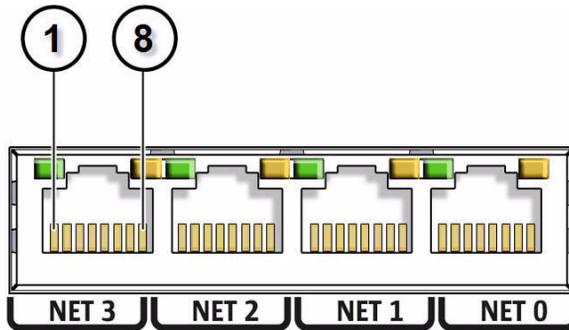
Note – Ethernet ports NET 2 and NET 3 are nonfunctional in single-processor systems.

TABLE: 10-GbE Port Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	6	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 –

Related Information

- "Server Back Panel View" on page 5
- "Disconnect Cables From the Server" on page 39
- "Reconnect Data Cables and Power Cords" on page 149

Network Management Port

The server has one 10/100BASE-T Ethernet management domain interface, labeled NET MGT. For information on configuring this port for managing the server with Oracle ILOM, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at http://www.oracle.com/goto/ILOM/docs.

TABLE: Network Management Port Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

Related Information

- "Server Back Panel View" on page 5
- "Disconnect Cables From the Server" on page 39
- "Reconnect Data Cables and Power Cords" on page 149

Serial Management Port

The serial management connector (labeled SER MGT) is an RJ-45 connector that can be accessed from the rear panel. This port is the default connection to the server. Use this port *only* for server management.

TABLE: Default Serial Connections for Serial Port

Parameter	Setting
Connector	SER MGT
Rate	9600 baud
Parity	None
Stop bits	1
Data bits	8

The following figure and table describe the SER MGT port pin signals.

TABLE: Serial Management Port Signals

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

If you need to connect to the SER MGT port using a cable with either a DB-9 or a DB-25 connector, follow the pin descriptions in the tables to create a crossover adapter appropriate for your serial connection.

TABLE: RJ-45 to DB-9 Adapter Crossover Wiring Reference

Serial Port (RJ-45 Connector)		DB-9 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	Signal Ground	5	Signal Ground
5	Signal Ground	5	Signal Ground
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

TABLE: RJ-45 to DB-25 Adapter Crossover Wiring Reference

Serial Port (RJ-45 Connector)		DB-25 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	5	CTS
2	DTR	6	DSR
3	TXD	3	RXD
4	Signal Ground	7	Signal Ground
5	Signal Ground	7	Signal Ground
6	RXD	2	TXD
7	DSR	20	DTR
8	CTS	4	RTS

Related Information

Video Connector

The video connector is a DB-15 connector that can be accessed from the back panel.
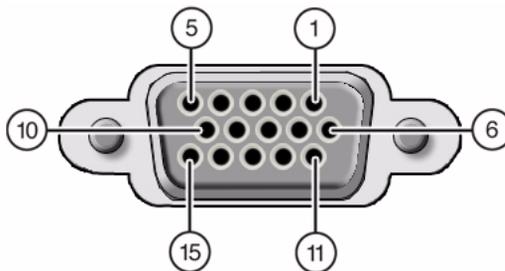
TABLE: Video Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Red Video	9	[KEY]
2	Green Video	10	Sync Ground
3	Blue Video	11	Monitor ID - Bit 1
4	Monitor ID - Bit 2	12	Monitor ID - Bit 0
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	N/C (Reserved)
8	Blue Ground		

Related Information

- "Server Back Panel View" on page 5
- "Disconnect Cables From the Server" on page 39
- "Reconnect Data Cables and Power Cords" on page 149

USB Ports

The server has six USB ports for attaching supported USB 2.0-compliant devices. There are two USB ports on the server front panel, two on the rear panel, and two on the motherboard.
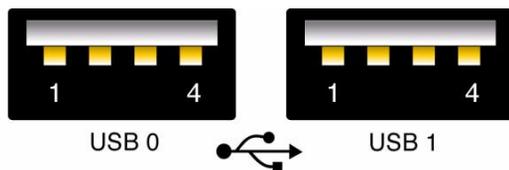
TABLE: USB Port Signals

Pin	Signal Description
1	+5 V
2	DAT-
3	DAT+
4	Ground

Related Information

- *"Server Back Panel View"* on page 5
- *"Disconnect Cables From the Server"* on page 39
- *"Reconnect Data Cables and Power Cords"* on page 149

Setting Up BIOS Configuration Parameters

This section provides an overview of BIOS configuration management, Legacy BIOS, UEFI BIOS, and the BIOS Setup utility.

Description	Links
Learn about the tools available to manage the BIOS configuration.	"Managing the BIOS Configuration" on page 161
Learn how to access the BIOS Setup Utility.	"Accessing the BIOS Setup Utility" on page 162
Learn about Legacy BIOS and UEFI BIOS.	"Using Legacy or UEFI BIOS" on page 167
Learn how BIOS allocates Option ROM and I/O resources.	"Using BIOS for Resource Allocation" on page 170
Learn how to perform common BIOS setup procedures.	"Common BIOS Setup Utility Tasks" on page 172

Related Information

- "BIOS Setup Utility Menu Options" on page 197

Managing the BIOS Configuration

The BIOS configuration parameters on an Oracle x86 server are manageable from the BIOS Setup Utility and Oracle ILOM. You can also download the BIOS firmware using Oracle System Assistant. For information about using these tools to manage the BIOS configuration, see:

- **Oracle System Assistant** – *Oracle X4 Series Servers Administration Guide* at `http://www.oracle.com/goto/x86AdminDiag/docs`.

- **Oracle ILOM** – "Maintaining x86 BIOS Configuration Parameters" in the *Oracle ILOM 3.1 Configuration and Maintenance Guide*
- **BIOS Setup Utility** – "Common BIOS Setup Utility Tasks" on page 172

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: http://www.oracle.com/goto/ILOM/docs

Accessing the BIOS Setup Utility

The BIOS Setup Utility provides six main menus that you can use to view product information, and to configure, enable, and disable, or manage system components.

This section provides the following information:

BIOS Setup Utility Menus

The following table provides descriptions for the top-level BIOS Setup Utility menus.

TABLE: BIOS Setup Utility Menus Summary

Menu	Description
Main	General product information, including memory, time/date, security settings, system serial number, and CPU and DIMM information.
Advanced	Configuration information for the CPU, trusted computing, USB, and other information. Set the IP address for the server SP.
Boot	Enable or disable Oracle System Assistant support, set the boot mode to Legacy BIOS or UEFI BIOS, and configure the boot device priority.

TABLE: BIOS Setup Utility Menus Summary *(Continued)*

Menu	Description
IO	Manage configuration settings for I/O devices, such as I/O virtualization settings, and enable and disable Option ROMs.
UEFI Driver Control	Manage PCIe drivers for all configurable devices. Menu is only available when operating in UEFI BIOS Boot Mode.
Save & Exit	Save changes and exit, discard changes and exit, discard changes, or restore the default BIOS settings.

See "BIOS Setup Utility Menu Options" on page 197 for examples of each of these screens.

Related Information

- "BIOS Setup Utility Menu Options" on page 197
- "Navigate BIOS Setup Utility Menus" on page 165

BIOS Key Mappings

When viewing the BIOS output from a terminal using the serial console redirection feature, some terminals do not support function keys. BIOS supports the mapping of function keys to Control key sequences when serial redirection is enabled. The following table provides a description of the function key to Control key sequence mappings.

TABLE: Function Key to Control Key Sequence Mapping

Function Key	Control Key Sequence	BIOS POST Function	BIOS Setup Function
F1	Ctrl+Q	Not applicable	Activate the Setup Utility Help menu.
F2	Ctrl+E	Enter BIOS Setup Utility while the system is performing the power-on self-test (POST).	Not applicable
F7	Ctrl+D	Not applicable	Discard changes. (Not applicable to UEFI Driver Control menu)
F8	Ctrl+P	Activate the BIOS Boot Menu.	Not applicable

Function Key	Control Key Sequence	BIOS POST Function	BIOS Setup Function
F9	Ctrl+O	Launch Oracle System Assistant. BIOS boots to Oracle System Assistant, bypassing the current Boot Options Priority list for this one-time boot method.	Activate Load Optimal Values pop-up menu. (Not applicable to UEFI Driver Control menu)
F10	Ctrl+S	Not applicable	Activate Save and Exit pop-up menu. (Not applicable to UEFI Driver Control menu)
F12	Ctrl+N	Activate Network boot.	Not applicable

Related Information

-
-

▼ Access BIOS Setup Utility Menus

You can access the BIOS Setup Utility screens from the following interfaces:

- Use a USB keyboard and VGA monitor connected directly to the server. (A mouse is not required to access the BIOS Setup Utility.)
- Use a terminal (or terminal emulator connected to a computer) through the serial port on the back panel of the server.
- Connect to the server using the Oracle ILOM Remote Console application.

1. Reset or power on the server.

For example, to reset the server:

- **From the local server,** press the Power button on the front panel of the server to power off the server, and then press the Power button again to power on the server.
- **From the Oracle ILOM web interface,** click Host Management > Power Control and select Reset from the Select Action list.
- **From the Oracle ILOM CLI on the server SP,** type `reset /System`

The power-on self-test (POST) sequence begins.

2. **To enter the BIOS Setup Utility, press the F2 key (Ctrl+E from a serial connection) when prompted and while the BIOS is running the power-on self-tests (POST).**

The BIOS Setup Utility Main Menu screen appears.

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

        Project Version          25.01.05.00                Set the Date. Use T
        System Date              [Tue 03/05/2013]           to switch between D
        System Time              [14:02:06]                 elements.

        Active Logical Cores     40
        QPI Link Speed           8.0 GT/s
        Total Memory             256 GB (DDR3)
        Current Memory Speed     1600 MHz
        USB Devices:
              1 Drive, 1 Keyboard, 1 Mouse, 1 Point        ++: Select Screen
                                                           ↑↓: Select Item
        BMC Status               Healthy                   Enter: Select
        BMC Firmware Revision    3.1.2.0 r78939            +/-: Change Opt.
                                                           F1: General Help
        ▶ Product Information                              (CTRL+Q from serial
        ▶ CPU Information                                  keyboard)
        ▶ DIMM Information                                 Q: Scroll Help Pane
                                                           A: Scroll Help Pane
        ▶ Security Setting                                 ESC: Exit
```

Related Information

- "BIOS Setup Utility Menus" on page 162
- "BIOS Key Mappings" on page 163
- "BIOS Setup Utility Menu Options" on page 197

▼ Navigate BIOS Setup Utility Menus

To navigate the menus or options listed on a menu, use the arrow keys. The currently selected option or sub-menu is highlighted. For further instructions on how to navigate and change settings in the BIOS Setup Utility, refer to the online information provided on the menu.

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

See "Access BIOS Setup Utility Menus" on page 164.

2. **Use the left and right arrow keys to select the different primary menu options.**

   As you select each menu option, the top-level screen for that menu option appears.

3. **To navigate the options presented on a top-level screen, use the up and down arrow keys.**

   Only options that can be modified are highlighted when you press the up and down arrow keys.

   - If an option can be modified, as you select the option, user instructions for modifying the option appear in the right column of the screen.
   - If an option is a link to a sub-screen, a description of the sub-menu content appears in the right column.

4. **Modify an option by pressing the + or - keys (plus or minus keys) or by pressing Enter and selecting the desired option from the pop-up menus.**

5. **Press the Esc key to return from a sub-menu screen to the previous menu screen.**

   Pressing Esc from a top-level menu is equivalent to selecting the Discard Changes and Exit option from the Save & Exit Menu.

6. **Modify parameters as needed.**

7. **Press F10 to save your changes and exit the BIOS Setup Utility.**

   Alternatively, you can select the Save & Exit Menu, and then select the Save Changes and Reset to save your changes and exit the BIOS Setup Utility.

Note – After modifying any BIOS settings and selecting Save Changes and Reset from the Save & Exit Menu, the subsequent reboot might take longer than a typical reboot where no settings were modified. The additional delay is required to ensure that changes to the BIOS settings are synchronized with Oracle ILOM.

Related Information

- "BIOS Setup Utility Menus" on page 162
- "BIOS Key Mappings" on page 163
- "BIOS Setup Utility Menu Options" on page 197

Using Legacy or UEFI BIOS

The BIOS firmware controls the system from power-on until an operating system is booted. The BIOS is based on the Unified Extensible Firmware Interface (UEFI) specification. However, the BIOS supports booting from both Legacy BIOS and UEFI BIOS, depending on which operating system you are using.

This section includes the following information:

- "Selecting Legacy BIOS or UEFI BIOS Boot Mode" on page 167
- "Switching Between Legacy BIOS and UEFI BIOS" on page 168
- "UEFI BIOS Boot Mode Advantages" on page 169
- "Configuration Utilities for Add-In Cards" on page 169

Selecting Legacy BIOS or UEFI BIOS Boot Mode

BIOS supports two boot modes: Legacy BIOS and UEFI BIOS. You can set the UEFI BIOS Boot Mode using the Boot Menu in the BIOS Setup Utility. UEFI BIOS Boot Mode selection depends on the operating system type and configuration that is installed in the system. Some devices and operating systems do not yet support UEFI BIOS and can only boot in Legacy BIOS Boot Mode. Depending on your situation, you might have to specify which boot mode of BIOS you want to use, Legacy BIOS Boot Mode or UEFI BIOS Boot Mode.

Choose Legacy BIOS Boot Mode to allow host bus adapters (HBAs) to use Option ROMs. Choose UEFI BIOS Boot Mode to use UEFI drivers.

When using operating systems that support booting only from Legacy BIOS, the Legacy BIOS Boot Mode must be used. When using operating systems that support booting from Legacy BIOS or UEFI BIOS, either mode can be used. However, once a mode is chosen and an operating system is installed, the operating system can only be booted using the same mode that was used for the installation.

The following operating systems do not support UEFI BIOS:

- Oracle Solaris 10
- Oracle Linux 5.x
- Red Hat Enterprise Linux 5.x
- Oracle VM 3.2

For updates to this list, refer to the *Sun Server X4-2 Product Notes* at:

http://www.oracle.com/goto/X4-2/docs

Only devices that support the selected mode are listed on the BIOS Boot screen. If you select UEFI BIOS Boot Mode, only boot candidates that support UEFI BIOS are listed in the Boot Options Priority list. If you select Legacy BIOS Boot Mode, only boot candidates that support Legacy BIOS are listed in the Boot Options Priority list.

Related Information

- "Switching Between Legacy BIOS and UEFI BIOS" on page 168
- "UEFI BIOS Boot Mode Advantages" on page 169
- "Configuration Utilities for Add-In Cards" on page 169

Switching Between Legacy BIOS and UEFI BIOS

When switching between Legacy BIOS Boot Mode and UEFI BIOS Boot Mode (either direction), BIOS settings that affect the Boot Options Priority list settings will be changed. If the boot mode is changed, the boot candidates from the previous boot mode disappear. The boot candidates for the newly changed boot mode appear after you save your changes and reset the host and in the next boot to the BIOS Setup Utility.

Note – When switching between Legacy BIOS Boot Mode and UEFI BIOS Boot mode, Boot Options Priority list settings will not be preserved. Typically, once a boot mode is selected, there is no need to switch boot modes. However, there is one notable exception: the Pc-Check utility must be run in Legacy BIOS Boot Mode. If boot settings are customized while in UEFI BIOS Boot Mode, and you need to run diagnostics, you should use the BIOS Backup and Restore feature to capture the customized settings prior to switching the boot mode to Legacy BIOS Boot Mode to run diagnostics. When you return to UEFI BIOS Boot Mode, you can use the Oracle ILOM Backup and Restore feature to reinstate your saved settings.

Because the settings for a given boot mode do not persist after a transition between modes, you should use the BIOS Backup and Restore feature to capture and preserve the BIOS configuration if you intend to switch back to the previous boot mode and want to retain your previous BIOS settings. For information about the BIOS Backup and Restore feature, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.

Related Information

- "Selecting Legacy BIOS or UEFI BIOS Boot Mode" on page 167
- "UEFI BIOS Boot Mode Advantages" on page 169
- "Configuration Utilities for Add-In Cards" on page 169

UEFI BIOS Boot Mode Advantages

When the option is available to choose between a Legacy BIOS Boot Mode or a UEFI BIOS Boot Mode operating system installation, the advantages to choosing a UEFI BIOS Boot Mode installation include the following:

- Avoids Legacy Option ROM address constraints. For more information, see "Legacy Option ROM Allocation" on page 170.

- Supports operating system boot partitions greater than 2 terabytes (2 TB) in size. For more information about limitations for supported operating systems, refer to the *Sun Server X4-2 Product Notes* at:

  http://www.oracle.com/goto/X4-2/docs

- Integrates PCIe device configuration utilities within the BIOS Setup Utility menus. For more information, see "BIOS Setup Utility Menu Options" on page 197.

- Displays bootable operating system images in the boot list as labeled entities, for example, you will see a Windows boot manager label as opposed to raw device labels.

Related Information

Configuration Utilities for Add-In Cards

The method for interacting with configuration utilities for add-in cards and (system resident) I/O adapters differs depending on whether Legacy BIOS Boot Mode or UEFI BIOS Boot Mode is used.

In Legacy BIOS Boot Mode, I/O adapter utilities are invoked during BIOS POST progression using hot keys identified by the adapter Option ROM during POST. When the hot key is pressed, the adapter specific configuration utility interface is presented. Often the interface will have a vendor-specific design.

In UEFI BIOS Boot Mode, the configuration screens for the add-in cards will appear as menu items in the BIOS UEFI Driver Control Menu as part of the standard BIOS Setup Utility screens. For example, if the Oracle Sun Storage 6Gb SAS PCIe RAID host bus adapter (HBA) is installed in the server, the configuration utility for the HBA appears as a menu selection on the BIOS UEFI Driver Control Menu.

Related Information

Using BIOS for Resource Allocation

This section explains how the BIOS allocates Option ROM and I/O resources.

Legacy Option ROM Allocation

In Legacy BIOS Boot Mode, there are PC architecture constraints on Legacy Option ROM allocation. These constraints do not apply to UEFI Option ROMs, which are often referred to as UEFI drivers.

Choose Legacy BIOS Boot Mode to allow host bus adapters (HBAs) to use Option ROMs. Choose UEFI BIOS Boot Mode to use UEFI drivers.

The system BIOS allocates 128 KB of address space for Legacy Option ROMs. This address space is shared between on-board devices and PCIe add-in cards. This fixed address space limitation is imposed by the PC architecture and not by the BIOS itself. It is possible to exhaust the available address space when installing PCIe add-in cards. When the address space is exhausted, Oracle ILOM displays an `Option ROM Space Exhausted` message, which means that one or more devices cannot load Option ROMs.

For example, if you install a SAS PCIe card, you might encounter a message similar to the following in the Oracle ILOM event log:

`Option ROM Space Exhausted - Device XXX Disabled`

By default, all on-board Legacy Options ROMs are enabled in the BIOS. However, you can disable most of these Option ROMs, unless they are required to support booting from the associated device or to provide some other boot-time function. For example, it is not necessary to load the Option ROM for the on-board network ports unless you want to boot from one or more network ports (even then, you can disable the Options ROMs for the remaining ports).

To minimize server boot time and reduce the likelihood of exhausting the available Option ROM address space, disable the Option ROMs for all devices that you do not intend to boot from. Enable Option ROMs only for those devices from which you intend to boot. If Option ROMs are enabled for more than one boot device, you might encounter an Option ROM space exhausted condition.

If you encounter the Option ROM space exhausted condition even after disabling all devices from which you do not intend to boot, then disable additional Option ROMs. Under some circumstances it might be necessary to disable Option ROMs for all devices except for the primary boot device.

Related Information

- "Access BIOS Setup Utility Menus" on page 164
- "Configure Option ROM Settings" on page 192

I/O Resource Allocation

The system provides 64 KB of I/O address space. With the increasing number of PCIe devices supported on the system, there is a possibility that there are not enough I/O resources for all the devices. Setup options are available to enable or disable the I/O resource allocation for each PCIe slot. The default for this option is enabled. When enabled, I/O resources are allocated to the device as normal. When disabled, I/O resources are not allocated to the device.

If there are one or more Sun Quad Port Gigabit Ethernet PCIe Low Profile Adapter cards installed in the server, then the BIOS might detect a condition where legacy I/O address space resources are exhausted. The following is a common form of error that might be logged:

```
6491 Tue Dec 7 14:19:57 2012 IPMI Log minor

ID = a5a9 : 12/07/2012 : 14:19:57 : System Firmware Error :

sensor number

= 0x00 : PCI resource exhaustion : Bus 147 Device 0 Func 0

6490 Tue Dec 7 14:19:57 2012 IPMI Log minor

ID = a5a8 : 12/07/2012 : 14:19:57 : System Firmware Error :

sensor number

= 0x00 : PCI resource exhaustion : Bus 147 Device 0 Func 1
```

To eliminate the PCI resource exhaustion condition, you should disable I/O resource allocation for any slot in which the Sun Quad Port Gigabit Ethernet PCIe Low Profile Adapter card is installed unless you intend to use that card as a bootable device. If you intend to use that card as a bootable device and you are encountering a PCI resource exhaustion event for that specific device, then it is necessary to disable I/O

allocation for some of the other card slots in the system. In general, it is safe, but not typically required, to disable I/O resource allocation for any cards not intended to be used as bootable devices, similar to the disabling of Option ROMs.

Related Information

- "Access BIOS Setup Utility Menus" on page 164
- "Configure I/O Resource Allocation" on page 193

Common BIOS Setup Utility Tasks

This section presents the procedures for some of the BIOS setup tasks that you will typically perform when setting up and managing the server.

- "Verify BIOS Factory Default Settings" on page 172
- "Select Legacy BIOS or UEFI BIOS Boot Mode" on page 173
- "Select the Boot Device" on page 175
- "Configure iSCSI Virtual Drives" on page 176
- "Enable or Disable Oracle System Assistant" on page 184
- "Configure TPM Support" on page 186
- "Configure SP Network Settings" on page 189
- "Configure Option ROM Settings" on page 192
- "Configure I/O Resource Allocation" on page 193
- "Exit BIOS Setup Utility" on page 194

▼ Verify BIOS Factory Default Settings

In the BIOS Setup Utility, you return the BIOS settings to the optimal factory default values, as well as view and edit settings as needed. Any changes that you make in the BIOS Setup Utility (using the F2 key) persist until the next time you change the settings.

Before you begin, ensure that the following requirements are met:

- A hard disk drive or solid state drive is properly installed in the server.
- A console connection is established to the server.

1. Reset or power on the server.

- **From the local server,** press the Power button on the front panel of the server to power off the server, and then press the Power button again to power on the server.

- **From the Oracle ILOM web interface,** click Host Management > Power Control and select Reset from the Select Action list.

- **From the Oracle ILOM CLI on the server SP,** type **reset /System**

  The server resets.

2. **When prompted, press the F2 key to access the BIOS Setup Utility.**

3. **To ensure that the factory defaults are set, do the following:**

   a. **Press the F9 key to automatically load the optimal factory default settings.**

      A message appears prompting you to continue this operation by selecting OK or to cancel the operation by selecting Cancel.

   b. **In the message, highlight OK, and then press Enter.**

      The BIOS Setup Utility screen appears with the cursor highlighting the first value on the screen.

4. **Press F10 to save the changes and exit the BIOS Setup Utility.**

   Alternatively, you can save the changes and exit the BIOS Setup Utility by navigating to the Save & Exit Menu and selecting Save Changes and Reset.

Related Information

-
-
-

▼ Select Legacy BIOS or UEFI BIOS Boot Mode

The BIOS firmware supports both Legacy BIOS Boot Mode and UEFI BIOS Boot Mode. The default setting is Legacy BIOS Boot Mode. Because some operating systems (OS) support both Legacy BIOS and UEFI BIOS, and some operating systems support only Legacy BIOS, you have the following options:

- If the OS being installed supports only Legacy BIOS, you must ensure that the BIOS is set to Legacy BIOS Boot Mode before you do the OS installation.

- If the OS being installed supports both Legacy BIOS and UEFI BIOS, you can set the BIOS to either Legacy BIOS Boot Mode or UEFI BIOS Boot Mode before you do the OS installation.

The following operating systems do not support UEFI BIOS:

- Oracle Solaris 10

- Oracle Linux 5.x
- Red Hat Enterprise Linux 5.x
- Oracle VM 3.2

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

   See .

2. **From the BIOS Main Menu screen, select** `Boot`**.**

   The Boot Menu screen appears.

3. **From the Boot Menu screen, use the up and down arrow keys to select**
   `UEFI/Legacy BIOS Boot Mode`**, and then press Enter.**

   The UEFI/BIOS dialog box appears.

```
         Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
           Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

         UEFI/BIOS Boot Mode          [Legacy BIOS]          UEFI: Only UEFI Boot
                                                             options are initialized
         Retry Boot List             [Disabled]             and present to user.
         Network Boot Retry          [Enabled]              Legacy BIOS: Only
       ▶ OSA Configuration                                  legacy boot options are
                                                            initialized and present
         Boot Option Priority                               to user.
         [PXE:NET0:IBA XE Slot   ┌──── UEFI/BIOS Boot Mode ────┐
         [PXE:NET1:IBA XE Slot   │ Legacy BIOS                 │
         [PXE:NET2:IBA XE Slot   │ UEFI                        │
         [PXE:NET3:IBA XE Slot   │                             │  Select Screen
                                 └─────────────────────────────┘  Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                            AB
```

Note – You cannot configure the boot device priority after switching the boot mode.
A system reboot is required to properly populate the Boot Options Priority list with
devices that support the chosen boot mode.

---

4. **Use the up and down arrow keys to select the appropriate boot mode, and then
   press Enter.**

5. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information

- "BIOS Setup Utility Menus" on page 162
- "BIOS Key Mappings" on page 163

▼ Select the Boot Device

The Boot Options Priority list contents depend on which BIOS boot mode is selected. When UEFI BIOS Boot Mode is selected, only UEFI BIOS boot candidates will be initialized and displayed in the Boot Options Priority list. When Legacy BIOS is selected, only Legacy BIOS boot candidates are initialized and displayed.

In addition to using the F2 key to view or edit the system BIOS settings, you can use the F8 key during the BIOS startup to specify a temporary boot device. This selected boot device is in effect only for the current system boot. The permanent boot device specified using the F2 key will be in effect after booting from the temporary boot device.

1. **Reset or power on the server.**

   - **From the local server,** press the Power button on the front panel of the server to power off the server, and then press the Power button again to power on the server.

   - **From the Oracle ILOM web interface,** click Host Management > Power Control and select Reset from the Select Action list.

   - **From the Oracle ILOM CLI on the server SP,** type **reset /System**

     The server resets.

2. **Press the F8 key (or Ctrl+P from a serial connection) when prompted while the BIOS is running the power-on self-test (POST).**

   The Please Select Boot Device dialog box appears.

3. **In the dialog box, select the boot device option according to the operating system and BIOS mode you elected to use, and then press Enter.**

   Use the up and down arrow keys to select the boot device. Based on the boot mode you selected (UEFI BIOS Boot Mode or Legacy BIOS Boot Mode), the Please Select Boot Device dialog box displays only the applicable devices. For example, when the UEFI BIOS Boot Mode is elected, only UEFI BIOS boot devices are displayed in the dialog.

4. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information

- "BIOS Setup Utility Menus" on page 162
- "BIOS Key Mappings" on page 163

▼ Configure iSCSI Virtual Drives

iSCSI virtual drives are used primarily to run supported operating systems that reside on an external server that function as the Sun Server X4-2 host operating system.

iSCSI virtual drives must be configured in the iSCSI BIOS Setup Utility screens. You must set the iSCSI parameters on the selected port.

Before you begin:

- You should be familiar with iSCSI theory of operation for the selected OS.
- Refer to the OS documentation to verify that iSCSI targets can be mounted on a client.
- You will need access to an external iSCSI server running on any supported OS.
- The Sun Server X4-2 must be in UEFI BIOS Boot Mode, not Legacy BIOS Boot Mode.

  See "Select Legacy BIOS or UEFI BIOS Boot Mode" on page 173.

- You must provide the following information from the iSCSI target server. The following items are entered into the iSCSI BIOS Setup Utility screens:

Item Number	Name	Example
1	Target name	`iqn.198812.com.oracle:x4-2-target` **Note -** iSCSI requires an iqn format for this item.
2	iSCSI initiator name	`iqn.198812.com.oracle:002222de444e` **Note -** iSCSI requires an iqn format for this item.
3	Virtual device	Virtual Disk 0
4	Logical Unit Number	LUN 0
Additional Information:		
5	IP address of iSCSI server	111.111.1.11 (IPv4)
6	Port number	3210

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

   See "Access BIOS Setup Utility Menus" on page 164.

2. **In the BIOS Setup Utility menus, navigate to the UEFI Driver Control Menu.**

   Options displayed include iSCSI booting and all controllable devices.

Note – The selection for iSCSI will always be an option in UEFI BIOS Boot mode; however, other menu options might change depending on which cards are installed in the system.

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
            Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

        ▶ iSCSI                                        Configure the iSCSI
        ▶ Intel(R) Ethernet Controller 10 Gigabit X -  parameters.
          00:21:28:E7:74:06
        ▶ Intel(R) Ethernet Controller 10 Gigabit X -
          00:21:28:E7:74:07
        ▶ LSI SAS2 MPT Controller SAS2008
          (PCIDevId:0x72, PCIVendorId:0x1000,
          PCIBus:0x50, PCIDevice:0x0, PCIFunc:0x0,
          PCISlot:0x4)
        ▶ Intel(R) Ethernet Controller 10 Gigabit X -  ←→: Select Screen
          00:21:28:E7:74:08                            ↑↓: Select Item
        ▶ Intel(R) Ethernet Controller 10 Gigabit X -  Enter: Select
          00:21:28:E7:74:09                            +/-: Change Opt.
                                                        F1: General Help
                                                        (CTRL+Q from serial
                                                        keyboard)
                                                        Q: Scroll Help Pane Up
                                                        A: Scroll Help Pane Down
                                                        ESC: Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

3. **Select** iSCSI**, and then to press Enter.**

   The iSCSI Initiator Name screen appears.

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                    UEFI Driver Control

  iSCSI Initiator Name                           The worldwide unique
                                                 name of iSCSI
                                                 Initiator. Only IQN
  ▶ Add an Attempt                               format is accepted.

  ▶ Delete Attempts

  ▶ Change Attempt Order
                                                 ▸◂: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 (CTRL+Q from serial
                                                 keyboard)
                                                 Q: Scroll Help Pane Up
                                                 A: Scroll Help Pane Down
                                                 ESC: Exit

           Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
                                                                          AB
```

4. Select iSCSI Initiator Name**, and then press Enter-.**

The iSCSI Initiator Name dialog box appears.

```
 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc
                          UEFI Driver Control

  iSCSI Initiator Name                            The worldwide uniq
                                                  name of iSCSI
► Add an Attempt                                  Initiator. Only IQ
                                                  format is accepted
► Delete Attempts
                           ─── iSCSI Initiator Name ───
► Ch ┌──────────────────────────────────────────────────────┐
     │ _                                                      │
     │                                                        │
     │                                                        │
     │                                                        │
     │                                                        │
     └────────────────────────────────────────────────────────┘
                                                  F1: General Help
                                                  (CTRL+Q from seria
                                                  keyboard)
                                                  Q: Scroll Help Pan
                                                  A: Scroll Help Pan
                                                  ESC: Exit
```
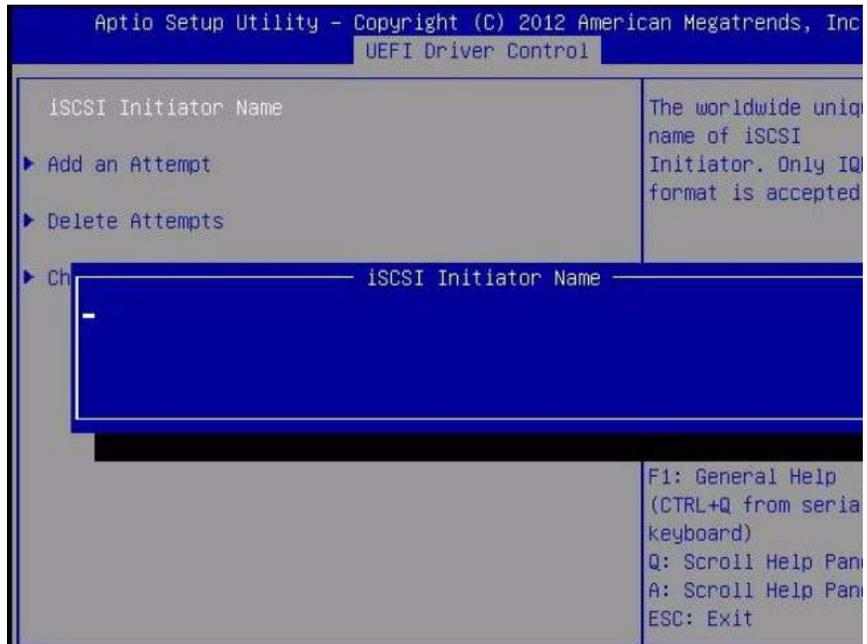
5. **Type the desired iSCSI Qualified Name (IQN) into the iSCSI Initiator Name dialog box, and then press Enter to save the changes.**

   The IQN identifies:

   The string "iqn"

   A date code that specifies the year and month in which the organization registered the domain or subdomain name used as the naming authority string

   The organizational naming authority string, which consists of a valid, reversed domain or subdomain name

   Optionally, a ":" (colon) followed by a string that the assigning organization can choose, which must make each assigned iSCSI name unique

   The iSCSI Initiator Name must conform to the IQN naming scheme (see *RFC 3271 – Internet Small Computer Systems Interface (iSCSI) Naming and Discovery*). For example: `iqn.1988-2.com.oracle:000000000000`

   The iSCSI Initiator Name appears in the UEFI Driver Control screen.

```
           Aptio Setup Utility - Copyright (C) 2012
                                       UEFI Driver Contr

        iSCSI Initiator Name                iqn.1988-2.com.or
                                            cle:000000000000

     ▶ Add an Attempt

     ▶ Delete Attempts

     ▶ Change Attempt Order
```

6. **Select** `Add an Attempt`**, and then press Enter.**

   The Add an Attempt screen appears.

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc
                                    UEFI Driver Control

    ▶ MAC 00:10:E0:0E:24:52                      PFA: Bus 32 | Dev
    ▶ MAC 00:10:E0:0E:24:53                      Func 0
    ▶ MAC 00:10:E0:0E:24:54
    ▶ MAC 00:10:E0:0E:24:55




                                                 ──────────────
                                                 ↔: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 (CTRL+Q from seria
                                                 keyboard)
                                                 Q: Scroll Help Pan
                                                 A: Scroll Help Pan
                                                 ESC: Exit
```

7. **Select the NIC port MAC address that corresponds to your chosen iSCSI boot target, and then press Enter.**

   For example: `Port 00-21-28-E7-71-06`.

   The Port Configuration screen appears. iSCSI is disabled by default.

   ```
   Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc
                           UEFI Driver Control

   iSCSI Attempt Name          1                    ▲  The human name def
                                                       for this attempt.
   iSCSI Mode                  [Disabled]

   Internet Protocol           [IP4]

   Connection Retry Count      0
   Connection Establishing     1000
   Timeout

   OUI-format ISID             0010E00E2452            →←: Select Screen
   Configure ISID              0E2452                  ↑↓: Select Item
                                                       Enter: Select
   Enable DHCP                 [[ ]]                   +/-: Change Opt.
     Initiator IP Address      0.0.0.0                 F1: General Help
     Initiator Subnet Mask     0.0.0.0                 (CTRL+Q from seria
     Gateway                   0.0.0.0                 keyboard)
                                                       Q: Scroll Help Pan
     Target Name                                    ▼  A: Scroll Help Pan
                                                       ESC: Exit
   ```

8. **Select** `iSCSI Mode`**, and then press the + or - key (plus or minus key) to toggle** `iSCSI Mode` **to** `Enabled` **to enable the iSCSI port for iSCSI boot.**

9. **Determine whether you want to set DHCP to enabled or disabled.**

   DHCP is disabled by default.

   - If you keep DHCP disabled, continue to Step 10.
   - If you set DHCP to enabled, continue to Step 11.

10. **If you elect to keep DHCP disabled, manually enter the following settings, and then press Enter to save your changes.**

    a. **Select** `Target Name`**, and then type the iqn target name.**

       For example: **iqn.1988-12.oracle.com:X4-2-target**

    b. **Select** `Target IP Address`**, and then type the target IP address of the iSCSI server in dotted-decimal notation.**

       For example: **111.111.1.11**

c. **Select** `Target Port`**, and then type the target port of the iSCSI server.**

For example: **3260** (default target port setting)

Note – When iSCSI is enabled on a network port, PXE is disabled for the port.

---

d. **Select** `Boot LUN`**, and then type the hexadecimal representation of the logical unit number (LUN).**

For example: **0**

e. **Continue to** Step 12

11. **To set DHCP to enabled, do the following, and then press Enter to save your changes.**

a. **Select** `Enable DHCP` **setting, and then press the + or - key (plus or minus key) to change the setting to** `Enabled`**.**

You do not need to enter the settings for the iSCSI Initiator and the related fields are hidden.

b. **Select** `Get target info via DHCP`**, and toggle the setting to** `Enabled`**.**

The target information is retrieved from the DHCP service and the related fields are hidden

The following screen shows `Enable DHCP` and `Get target info via DHCP` set to `Enabled`.

```
      Aptio Setup Utility - Copyright (C) 2012 American Megatrends, In
                           UEFI Driver Control

                                                 ▲ Get target info v
    OUI-format ISID           0010E00E2452
    Configure ISID            0E2452

    Enable DHCP               [[X]]

    Get target info via DHCP  [[X]]

    Authentication Type       [CHAP]
      CHAP Type               [One way]
        CHAP Name                                ──────────────────
        CHAP Secret                              ┼┼: Select Screen
                                                 ↑↓: Select Item
    Save Changes                                 Enter: Select
  ▸ Back to Previous Page                        +/-: Change Opt.
                                                 F1: General Help
                                                 (CTRL+Q from seri
                                                 keyboard)
                                                 Q: Scroll Help Pa
                                                 A: Scroll Help Pa
                                                 ▼ ESC: Exit
```

12. **Select a Challenge-Handshake Authentication Protocol (CHAP) Type to enable password security.**

   - None – If None is selected, the default setting, CHAP is disabled and not required.

   - One Way (also known as unidirectional) – If One Way is selected, the CHAP Name and CHAP Secret are required.

     - CHAP Name – User configurable. Typically the name of the Initiator, but can be any name. Must also be set at the target to authenticate the Initiator.

     - CHAP Secret – User configurable password. Must be set on the target and the Initiator.

   - Mutual – If Mutual (also known as bidirectional) is selected, CHAP Name, CHAP Secret, Reverse CHAP Name, and Reverse CHAP Secret are required.

     - Reverse CHAP Name – Set a CHAP name for the target as a parameter of the target.

     - Reverse CHAP Secret – Set a password for the target.

Note – The target must be configured to acknowledge a CHAP and for the parameters to be used.

```
┌────────────────────────────────────────────────────────────────────────┐
│        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.│
│                        UEFI Driver Control                               │
├────────────────────────────────────────────────────────────────────────┤
│ Enable iSCSI            [Enabled]           ▲ None, One way CHAP or       │
│ Enable DHCP             [Disabled]            mutual CHAP                 │
│   Initator IP Address   10.10.1.50                                       │
│   Initiator Subnet Mask 255.0.0.0                                        │
│   GateWay               0.0.0.0                                          │
│                                                                          │
│   Target Name          ┌─── CHAP Type ───┐                               │
│                        │ None            │                               │
│                        │ One way         │                               │
│                        │ Mutual          │                               │
│   Target IP Address    └─────────────────┘  →←: Select Screen            │
│   Target Port                                ↑↓: Select Item             │
│   Boot LUN              0                    Enter: Select                │
│                                              +/-: Change Opt.            │
│ CHAP Type               [Mutual]             F1: General Help            │
│   CHAP Name                                  (CTRL+Q from serial         │
│   CHAP Secret                                keyboard)                   │
│   Reverse CHAP Name                          Q: Scroll Help Pane Up      │
│   Reverse CHAP Secret                       ▼ A: Scroll Help Pane Down    │
│                                              ESC: Exit                    │
├────────────────────────────────────────────────────────────────────────┤
│       Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.     │
└────────────────────────────────────────────────────────────────────────┘
```

13. Verify that your settings match the iSCSI target server information.

14. Press F10 to save the changes and exit the BIOS Setup utilities.

See "Exit BIOS Setup Utility" on page 194.

15. Restart the server.

16. Press the F8 key (or Ctrl+P from a serial console) when prompted while the BIOS is running the power-on-self-test (POST) code checkpoint tests.

The Please Select Boot device dialog box appears.

17. Verify that the iSCSI target appears in the boot list.

Related Information

- "Access BIOS Setup Utility Menus" on page 164
- "Exit BIOS Setup Utility" on page 194

▼ Enable or Disable Oracle System Assistant

If you have disabled Oracle System Assistant, you can use the BIOS Setup Utility Boot Menu to put the USB device in an online state, so that Oracle System Assistant becomes available to the operating system.

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

   See

2. **In the BIOS Setup Utility menus, navigate to the Boot Menu.**

   The Boot Menu screen appears.

```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
       Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

    UEFI/BIOS Boot Mode          [Legacy BIOS]           UEFI: Only UEFI Boot
                                                         options are initialized
    Retry Boot List              [Disabled]              and present to user.
    Network Boot Retry           [Enabled]               Legacy BIOS: Only
  ▶ OSA Configuration                                    legacy boot options are
                                                         initialized and present
    Boot Option Priority                                 to user.
    [PXE:NET0:IBA XE Slot 4000 v2193]
    [PXE:NET1:IBA XE Slot 4001 v2193]
    [PXE:NET2:IBA XE Slot 8800 v2193]
    [PXE:NET3:IBA XE Slot 8801 v2193]                    ────────────────────────
                                                         ↔: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F7: Discard Changes
                                                         F9: Optimized Defaults
                                                         F10: Save & Exit
                                                         ESC: Exit

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                        AB
```

3. **Select** `OSA Configuration`.

   The OSA Configuration screen appears. The setting for OSA Internal Support is either `Enabled` or `Disabled`.

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Boot

    OSA Configuration                           Enable or Disable
                                                Internal USB Ports for
    OSA Internal Support      [Enabled]         OSA boot




                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F7: Discard Changes
                                                F9: Optimized Defaults
                                                F10: Save & Exit
                                                ESC: Exit

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                      AB
```
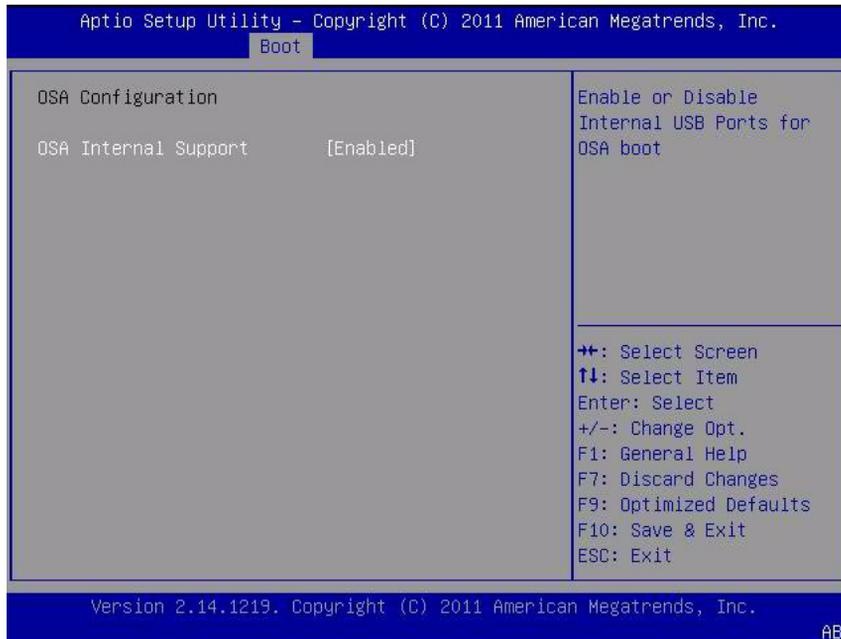
4. **To change the setting, use the + or - key (plus or minus), and then press Enter to select either** Enabled **or** Disabled**.**

5. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information
■ "BIOS Main Menu Selections" on page 198

▼ Configure TPM Support

If you intend to use the Trusted Platform Module (TPM) feature set, you must configure the server to support this feature.

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

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

   See "Access BIOS Setup Utility Menus" on page 164.

2. **In the BIOS Setup Utility menus, navigate to the Advanced Menu.**

   The Advanced Settings Menu screen appears.

3. **In the Advanced Menu screen, select** `Trusted Computing`**.**

   The TPM Configuration screen appears.

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Advanced

 TPM Configuration                                          Enables or Disables TPM
   TPM SUPPORT              [Disable]                        support. O.S. will not
                                                             show TPM. Reset of
                                                             platform is required.
 Current TPM Status Information
   TPM SUPPORT OFF

                                                            ++: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                          AB
```

4. **If the TPM State is listed as** `Disabled`**, select** `TPM Support` **and press Enter.**

   A TPM Support dialog box appears.

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
               Advanced

   TPM Configuration                                    Enables or Disables TPM
     TPM SUPPORT              [Disable]                 support. O.S. will not
                                                        show TPM. Reset of
                                                        platform is required.
   Current TPM Status Information
     TPM SUPPORT OFF

                        ┌────────── TPM SUPPORT ──────────┐
                        │ Disable                         │
                        │ Enable                          │
                        └─────────────────────────────────┘
                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                              AB
```

5. **In the dialog box, set** TPM Support **to** Enable**, and then press Enter.**

   The updated TPM Configuration screen appears.


```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
               Advanced

   TPM Configuration                                    Enables or Disables TPM
     TPM SUPPORT              [Enable]                   support. O.S. will not
     TPM State               [Disabled]                  show TPM. Reset of
   Pending TPM operation     [None]                      platform is required.


   Current TPM Status Information
     TPM Enabled Status:     [Disabled]
     TPM Active Status:      [Deactivated]
     TPM Owner Status:       [UnOwned]

                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                              AB
```

6. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information

- ■ "BIOS Setup Utility Menus" on page 162
- ■ "Exit BIOS Setup Utility" on page 194
- ■ Microsoft's Windows Trusted Platform Module Management documentation

▼ Configure SP Network Settings

Choose one of the following methods to specify service processor (SP) network settings:

- ■ **BIOS** – Assign the IP address for the server SP from the BIOS Setup Utility on the Advanced Menu.
- ■ **Oracle ILOM** – For instructions on setting the IP address for the server SP using Oracle ILOM, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at `http://www.oracle.com/goto/ILOM/docs`.
- ■ **Oracle System Assistant** – For instructions on using Oracle System Assistant to configure SP network settings, see the *Oracle X4 Series Servers Administration Guide* at `http://www.oracle.com/goto/x86AdminDiag/docs`.

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

   See "Access BIOS Setup Utility Menus" on page 164.

2. **In the BIOS Setup Utility menus, navigate to the Advanced Menu.**

   The Advanced Menu screen appears.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, In
  Main  Advanced  IO  Boot  Save & Exit

 ▶ Processors                          Processors
 ▶ USB Ports
 ▶ Serial Port Console Redirection
 ▶ Trusted Computing
 ▶ Network Stack
 ▶ BMC Network
                                       ─────────────────────
                                       �→←: Select Screen
                                       ↑↓: Select Item
                                       Enter: Select
                                       +/-: Change Opt.
                                       F1: General Help
                                       (CTRL+Q from seri
                                       keyboard)
                                       Q: Scroll Help Pa
                                       A: Scroll Help Pa
                                       ESC: Exit
```
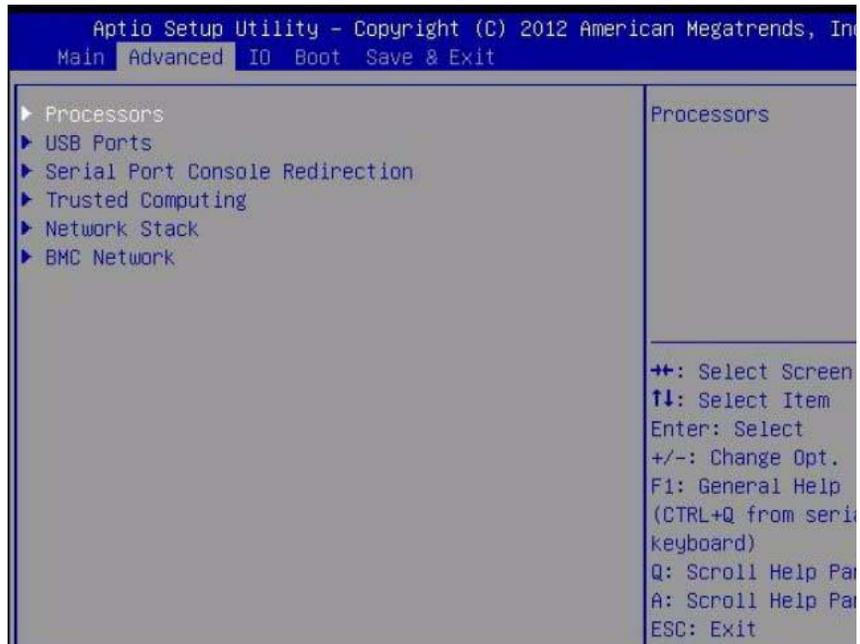
3. **In the Advanced Menu, select** `BMC Network`**, and then press Enter.**

   The BMC Network Configuration screen appears.

   The BMC is the Baseboard Management Controller.

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
               Advanced

    BMC Network                           ▲  Refresh current BMC Lan
    Current                               █  information
    Active Mgmt Port          NETMGT      █

  ▶ Refresh

    Active Mgmt Port          [NET MGT]

  ▶ Commit

    IPv4 Configuration                       ↔: Select Screen
                                             ↑↓: Select Item
    Channel Number            1              Enter: Select
    IPv4 IP Assignment        [Static]       +/-: Change Opt.
    Current IPv4 address in   N/A            F1: General Help
    BMC                                      F7: Discard Changes
    Current IPv4 MAC                         F9: Optimized Defaults
    address in BMC                           F10: Save & Exit
            N/A                           ▼  ESC: Exit

            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                          AB
```

4. **Select** Refresh**, and then press Enter to display the current BMC network settings.**

    The BMC Network Configuration screen appears.


```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, In
               Advanced

    Dynamic IPv6 Address 5                ▲  Commit current BM
            N/A                           █  information
    Dynamic IPv6 Address 6                █
            N/A
    Dynamic IPv6 Address 7
            N/A
    Dynamic IPv6 Address 8
            N/A
    Dynamic IPv6 Address 9
            N/A
    Dynamic IPv6 Address 10                  ↔: Select Screen
            N/A                              ↑↓: Select Item
                                             Enter: Select
  ▶ Refresh                                  +/-: Change Opt.
                                             F1: General Help
    IPv6 State              [Enabled]        (CTRL+Q from seri
    Auto IPv6 Configuration [Stateless]      keyboard)
                                             Q: Scroll Help Pa
  ▶ Commit                               ▼  A: Scroll Help Pa
                                             ESC: Exit
```

5. **Select** `Commit` **to update the BMC network settings with the latest values.**

6. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information

▼ Configure Option ROM Settings

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

2. **In the BIOS Setup Utility menus, navigate to the IO Menu.**

   The IO Menu screen appears.

```
         Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

   ▶ PCI Subsystem Settings                          PCI, PCI-X and PCI
   ▶ IO Virtualization                               Express Settings.
   ▶ IOAT

     Internal Devices
   ▶ NET0/1
   ▶ NET2/3

     Add-In Cards
   ▶ Slot 1
   ▶ Slot 2                                          ↔: Select Screen
   ▶ Slot 3                                          ↑↓: Select Item
   ▶ Slot Internal                                   Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F7: Discard Changes
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

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                                                                        AB
```
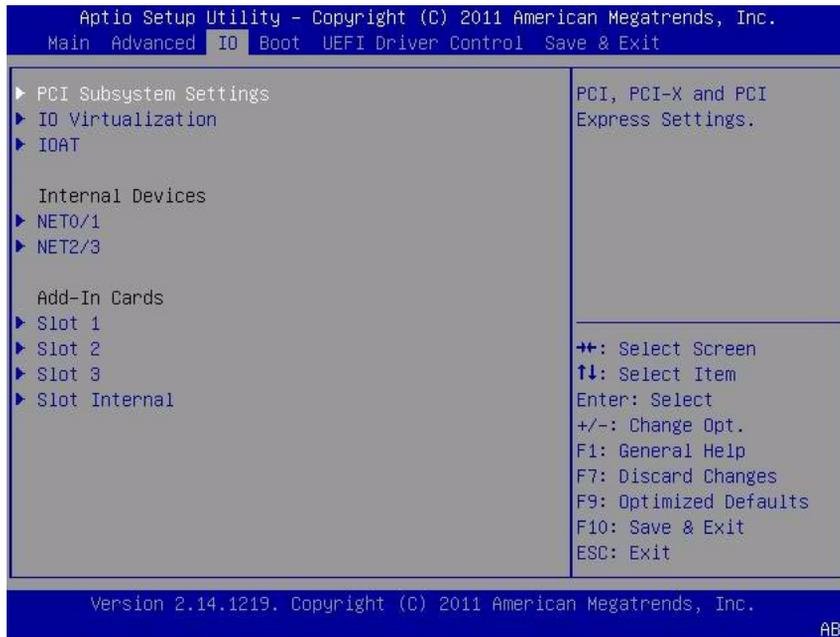
3. **Select the internal device or add-in card slot for which you want to enable or disable Option ROM.**

   The Option ROM screen for that device or add-in card slot appears.

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc
                IO

   NET0/1                                              NET0 OpROM Enable

   NET0 OpROM Enable          [Enabled]
   NET1 OpROM Enable          [Enabled]




                                                      ++: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      (CTRL+Q from seria
                                                      keyboard)
                                                      Q: Scroll Help Pan
                                                      A: Scroll Help Pan
                                                      ESC: Exit
```
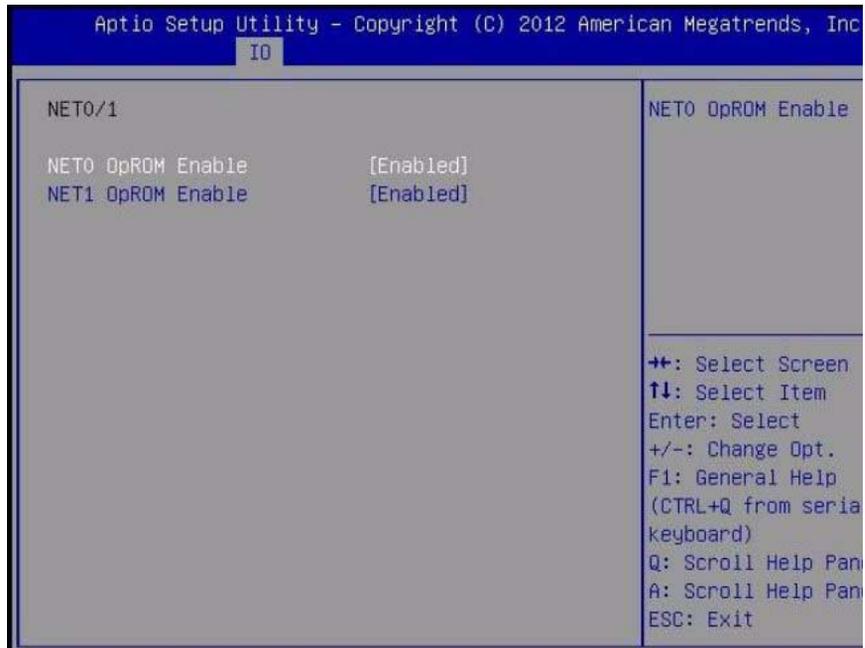
4. **Do one of the following:**

   - Select `Enabled` to enable the Option ROM setting for NET 0 or NET 1.
   - Select `Disabled` to disable the Option ROM setting for NET 0 or NET 1.

5. **Press the F10 key to save the changes and exit the BIOS Setup Utility.**

Related Information

- "Legacy Option ROM Allocation" on page 170
- "Access BIOS Setup Utility Menus" on page 164
- "BIOS Setup Utility Menus" on page 162
- "Exit BIOS Setup Utility" on page 194

▼ Configure I/O Resource Allocation

1. **Access the BIOS Setup Utility menus.**
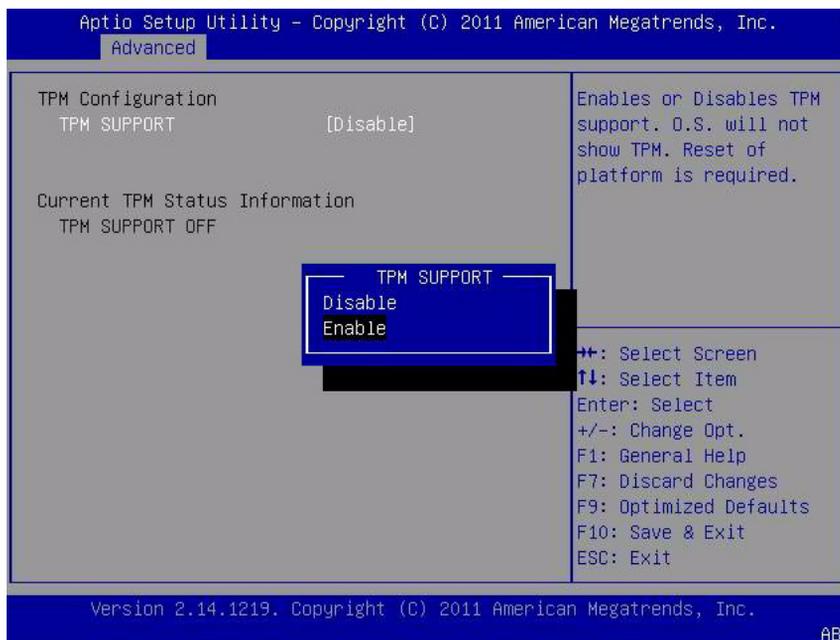
   See "Access BIOS Setup Utility Menus" on page 164.

2. **In the BIOS Setup Utility menus, navigate to the IO Menu.**

   The IO Menu screen appears.

3. **Select the add-in card you want to configure.**

4. **Do one of the following:**
   - Select `Enabled` to enable I/O resource allocation for the add-in card.
   - Select `Disabled` to disable I/O resource allocation for the add-in card.

5. **Press F10 to save the changes and exit the BIOS Setup Utility.**

Related Information
- "I/O Resource Allocation" on page 171
- "Access BIOS Setup Utility Menus" on page 164
- "BIOS Setup Utility Menus" on page 162
- "Exit BIOS Setup Utility" on page 194

▼ Exit BIOS Setup Utility

1. **Use the left and right arrow keys to navigate to the top-level Save & Exit Menu.**

2. **Use the up and down arrow keys to select the desired action.**

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

   A confirmation dialog box appears.

4. In the confirmation dialog box, select `Yes` **to proceed and exit the BIOS Setup Utility, or select** `No` **to stop the exit process.**

Note – After modifying any BIOS settings and selecting `Save Changes and Reset` from the Save & Exit Menu, the subsequent reboot might take longer than a typical reboot where no settings were modified. The additional delay is required to ensure that changes to the BIOS settings are synchronized with Oracle ILOM.

Related Information

- "Access BIOS Setup Utility Menus" on page 164
- "BIOS Setup Utility Menus" on page 162

BIOS Setup Utility Menu Options

This section includes searchable text-based representations and screenshots of the main menus in the BIOS Setup Utility for the Sun Server X4-2. Following the text and screenshot for each menu is a table of the options available from that menu.

The following sections are discussed.

Description	Links
Review the BIOS Main Menu selections.	"BIOS Main Menu Selections" on page 198
Review the BIOS Advanced Menu selections.	"BIOS Advanced Menu Selections" on page 203
Review the BIOS IO Menu selections.	"BIOS IO Menu Selections" on page 213
Review the Boot Menu selections.	"BIOS Boot Menu Selections" on page 217
Review the BIOS UEFI Driver Control Menu selections.	"UEFI Driver Control Menu Selections" on page 221
Review the BIOS Save & Exit Menu selections.	"BIOS Save & Exit Menu Selections" on page 225

Related Information

- *Oracle X4 Series Servers Administration Guide* at:
  http://www.oracle.com/goto/x86AdminDiag/docs
- "Setting Up BIOS Configuration Parameters" on page 161

BIOS Main Menu Selections

This section includes a searchable text-based representation and a screenshot of the BIOS Main Menu. The options that are available from the Main Menu are described in the table that follows. Options in the table that are marked as "(R/O)" are read-only information and cannot be changed.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit
/-----------------------------------------------+----------------------\
|   Project Version           25.01.05.00       |Set the Date. Use Tab  |
|   System Date               [Sat 07/16/2013]  |to switch between Data  |
|   System Time               [19:58:46]        |elements.              |
|                                               |                       |
|   Active Logical Cores      40                |                       |
|   QPI Link Speed            8.0 GT/s           |                       |
|   Total Memory              16 GB (DDR3)       |                       |
|   Current Memory Speed      1333 MHz           |                       |
|   USB Devices:                                | ---------------------|
|       1 Drive, 1 Keyboard, 1 Mouse, 3 Hubs    |><: Select Screen      |
|                                               |^v: Select Item        |
|                                               |                       |
|BMC Firmware Status       Healthy              |Enter: Select          |
|BMC Firmware Revision     3.1.2.0 r78939       |+/-: Change Opt.       |
|                                               |F1: General Help       |
|> Product Information                          |(Ctrl+Q from serial    |
|> CPU Information                              |keyboard)              |
|> DIMM Information                             |Q: Scroll Help Pane Up |
|                                               |A: Scroll Help Pane Down|
|> Security Setting                             |ESC: Exit              |
 -----------------------------------------------+----------------------/
 Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
          Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

        Project Version          25.01.05.00           Set the Date. Use T
        System Date              [Tue 03/05/2013]      to switch between D
        System Time              [14:02:06]            elements.

        Active Logical Cores     40
        QPI Link Speed           8.0 GT/s
        Total Memory             256 GB (DDR3)
        Current Memory Speed     1600 MHz
        USB Devices:
                1 Drive, 1 Keyboard, 1 Mouse, 1 Point  ↔: Select Screen
                                                       ↑↓: Select Item
        BMC Status               Healthy               Enter: Select
        BMC Firmware Revision    3.1.2.0 r78939        +/-: Change Opt.
                                                       F1: General Help
      ▶ Product Information                            (CTRL+Q from serial
      ▶ CPU Information                                keyboard)
      ▶ DIMM Information                               Q: Scroll Help Pane
                                                       A: Scroll Help Pane
      ▶ Security Setting                               ESC: Exit
```
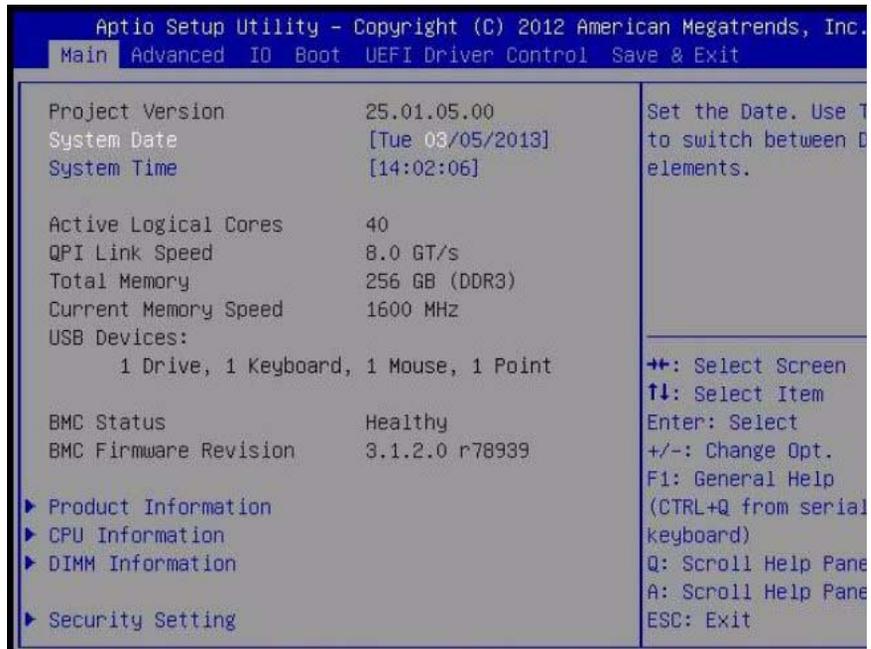
TABLE: BIOS Main Menu Options

Setup Options	Options	Defaults	Description
Project Version (R/O)			BIOS version is displayed. This string is a unique identifier used to reference a specific BIOS release. Format is XXYYZZPP, which indicates: • XX - Unique project/platform code. • YY - BIOS major release. • ZZ - BIOS minor release. • PP - Build number. Example: 18.01.04.01
System Date			Current date is displayed. You can change the date setting. Example: [Thu 10/20/2011]
System Time			Current time is displayed. You can change the time setting. Example: [13:38:27]
Active Logical Cores		40	

Setup Options	Options	Defaults	Description
QPI Link Speed (R/O)	SLOW/ 6.4 GT/s/ 7.2 GT/s/ 8.0 GT/s		Intel Quick Path Interconnect (QPI) operational speed is displayed.
Total Memory (R/O)			Memory in gigabytes is displayed. Example: 16-GB (DDR3)
Current Memory Speed (R/O)			Memory speed is displayed. Example: 1333 MHz
USB Devices (R/O)			Detected USB devices are displayed. Example: 1 keyboard, 1 mouse, 3 hubs
BMC Status (R/O)			
BMC Firmware Revision (R/O)			The service processor firmware version is displayed. Example: 3.1.2.0 r78939
PRODUCT INFORMATION (R/O)			Product information is displayed.
Product Name			Product name is displayed. Example: Sun Server X4-2
Product Serial Number			Product serial number is displayed. Example: 1134FML00V
Board Serial Number			Board serial number is displayed. Example: 0328MSL-1132U900
CPU INFORMATION (R/O)			Attributes of a single processor (CPU) are defined. A separate information structure is provided for each processor supported in the system. Most of the values are dependent on the processor.
Socket 0 CPU Information			If CPU socket 0 is populated, the following options are listed. Otherwise, displays "Not Present."
Intel CPU @ 2.70 GHz			Processor ID brand is displayed.

Setup Options	Options	Defaults	Description
CPU Signature			Processor (CPU) information is displayed. Example: 206d5
Microcode Patch			Software update (microcode patch) information is displayed. Example: 512
Max CPU Speed			Maximum non-turbo speed of the processor is displayed. Example: 2700 MHz
Min CPU Speed			Minimum speed of the processor is displayed. Example: 1200 MHz
Processor Cores			Number of available processor cores is displayed. Example: 8
Intel HT Technology			Indicates whether Intel Hyper Threading is supported.
Intel VT-x Technology			Indicates whether Intel Virtualization Technology is supported.
L1 Data Cache			Example: 32 KB x 8
L1 Code Cache			Example: 32 KB x 8
L2 Cache			Example: 256 KB x 8
L3 Cache			Example: 20480 KB
Socket 1 CPU Information			If CPU socket 1 is populated, the same options as Socket 0 CPU Information are displayed. Otherwise, displays "Not Present."
DIMM INFORMATION (R/O)			Memory module (DIMM) presence and size information are displayed.
CPU Socket 0 DIMM Information			If DIMM is present, memory size in gigabytes is displayed. Otherwise, displays "Not Present."

Setup Options	Options	Defaults	Description
D0...D7			Memory size in gigabytes is displayed. Example: Socket 0 DIMMs D0 – 4 GB D1 – 4 GB D2 – 4 GB D3 – 4 GB D4 – 2 GB D5 – 2 GB D6 – Not present D7 – Not present
CPU Socket 1 DIMM Information			If DIMM is present, memory size in gigabytes is displayed. Otherwise, displays "Not Present."
D0...D7			See previous DIMM information example.
SECURITY SETTING			Configure the security setting.
Administrator Password			Set the Administrator password.

Related Information

- "BIOS Advanced Menu Selections" on page 203
- "BIOS IO Menu Selections" on page 213
- "BIOS Boot Menu Selections" on page 217
- "UEFI Driver Control Menu Selections" on page 221
- "BIOS Save & Exit Menu Selections" on page 225

BIOS Advanced Menu Selections

This section includes a searchable text-based representation and a screenshot of the BIOS Advanced Menu. The options that are available from the Advanced Menu are described in the table that follows. Options in the table that are marked as "(R/O)" are read-only information and cannot be changed.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main   Advanced   IO   Boot   UEFI Driver Control   Save & Exit
/-------------------------------------------------+----------------------\
|> Processors                                     |CPU Configuration     |
|> USB Ports                                      |Parameters            |
|> Serial Port Console Redirection                |                      |
|> Trusted Computing                              |                      |
|> Network Stack                                  |                      |
|> BMC Network                                    |                      |
|                                                 |                      |
|                                                 |                      |
|                                                 |                      |
|                                                 |----------------------|
|                                                 |><: Select Screen     |
|                                                 |^v: Select Item       |
|                                                 |Enter: Select         |
|                                                 |+/-: Change Opt.      |
|                                                 |F1: General Help      |
|                                                 |F7: Discard Changes   |
|                                                 |F9: Optimized Defaults|
|                                                 |F10: Save & Exit      |
|                                                 |ESC: Exit             |
 -------------------------------------------------+----------------------/
 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

          ▶ Processors                                      CPU Configuration
          ▶ USB Ports                                       Parameters
          ▶ Serial Port Console Redirection
          ▶ Trusted Computing
          ▶ Network Stack
          ▶ BMC Network


                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
                                                                              AB
```

TABLE: BIOS Advanced Menu Options

Setup Options	Options	Defaults	Description
PROCESSORS			Enable or disable processor (CPU) features.
Hyper-threading	Disabled/Enabled	Enabled	When enabled, two threads are available per enabled core. When disabled, only one thread per enabled core is available.
Execute Disable Bit	Disabled/Enabled	Enabled	When enabled, execute disable bit can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Oracle Solaris, Oracle VM, Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and VMware ESXi).
Hardware Prefetcher	Disabled/Enabled	Enabled	Enable the mid-level cache (L2) streamer prefetcher.
Adjacent Cache Line Prefetcher	Disabled/Enabled	Enabled	Enable the mid-level cache (L2) prefetching of adjacent cache lines.

Setup Options	Options	Defaults	Description
DCU Streamer Prefetcher	Disabled/Enabled	Enabled	Enable prefetching of next L1 data line based on multiple loads in same cache line.
DCP IP Prefetcher	Disabled/Enabled	Enabled	Enable prefetching of next L1 line based on sequential load history.
Intel Virtualization Technology	Disabled/Enabled	Enabled	When enabled, a Virtual Machine Manager (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology.
CPU Power Management Configuration			Displays processor (CPU) information. BIOS provides C-states, P-states, and T-states support in order for the OS to manage the power utilization of the system. Power management is also controlled by the service processor based on system policies.
Power Technology	Disabled/Enabled/ Efficient/Custom	Efficient	Enable the power management features. The following options are not displayed if Power Technology is set to Disabled.
Intel SpeedStep	Disabled/Enabled	Enabled	Displays only if Power Technology is set to Custom. Enable or disable Intel SpeedStep. The Intel technology used to support P-state transitions is referred to as Intel SpeedStep.
Turbo Mode	Disabled/Enabled	Enabled	Displays only if Power Technology is set to Custom, Intel SpeedStep is set to enabled, and Turbo Mode is supported in the CPU. Enable or disable Turbo Mode.
CPU C3 Report	Disabled/Enabled	Disabled	Displays only if Power Technology is set to Custom and power state (C3) is supported in the CPU. Enable or disable CPU C3 (ACPI C2) report to operating system.

Setup Options	Options	Defaults	Description
CPU C6 Report	Disabled/Enabled	Enabled	Displays only if Power Technology is set to Custom and power state (C6) is supported in the CPU. Enable or disable CPU C6 (ACPI C3) report to operating system.
CPU C7 Report	Disabled/Enabled	Enabled	Displays only if Power Technology is set to Custom and power state (C7) is supported in the CPU. Enable or disable CPU C7 (ACPI C3) report to operating system.
Package C-States	Disabled/Enabled	Enabled	Displays only if Power Technology is set to Custom. The power state control is referred to as C-State. Enable or disable the Package C-State limit.
Energy Performance	Performance/ Balanced Performance/ Balanced Energy/ Energy Efficient	Balanced Performance	Optimize between performance and power savings. Windows 2008 and later operating systems override this value according to its power plan.
USB PORTS			Set USB port configuration parameters.
EHCI Hand-off	Disabled/Enabled	Disabled	Enable or disable Enhanced Host Controller Interface (EHCI) hand-off support.
Port 60/64 Emulation	Disabled/Enabled	Enabled	Enable I/O port 60h/64h emulation support. Enable this setting for the complete USB keyboard legacy support for non-USB aware operating systems.
All USB Devices	Disabled/Enabled	Enabled	Enable or disable all USB devices.
Rear Port 0	Disabled/Enabled	Enabled	Enable or disable USB Port 0.
Rear Port 1	Disabled/Enabled	Enabled	Enable or disable USB Port 1.
Front Port 0	Disabled/Enabled	Enabled	Enable or disable USB Port 2.
Front Port 1	Disabled/Enabled	Enabled	Enable or disable USB Port 3.
Internal Port 0	Disabled/Enabled	Enabled	Enable or disable USB Port 4.

Setup Options	Options	Defaults	Description
Internal Port 1	Disabled/Enabled	Enabled	Enable or disable USB Port 5.
SERIAL PORT CONSOLE REDIRECTION			Provides the capability to redirect console output/input to the serial port. Graphic output is not redirected. BIOS serial console redirection lets you monitor BIOS POST messages and navigate the BIOS Setup Utility menus and Option ROMs from a terminal connected to the server using a serial connection.
External Serial Port	System/BMC	System	Control whether the external serial port connects to the Baseboard Management Controller (BMC) or directly to the system. Set to BMC for serial link management.
EMS Console Redirection	Disabled/Enabled	Disabled	Enable or disable console redirection for Windows Emergency Management Service (EMS) administration.
Console Redirection	Disabled/Enabled	Enabled	Enable or disable console redirection.
Terminal Type	VT100/ VT100+/ VT-UTF8/ ANSI	VT100+	Select the emulation for the terminal: • VT100: ASCII character set. • VT100+: Extends VT100 to support color, function keys, etc. • VT-UTF8: Uses UTF8 encoding to map Unicode characters onto one or more bytes. • ANSI: Extended ASCII character set.
Bits per Second	9600/ 10200/ 57600/ 115200	9600	Select the serial port transmission speed. The speed must be matched on the connecting serial device. Long or noisy lines require lower speeds.
Data Bits	07/ 08/ 11	8	Select the data bits.

Setup Options	Options	Defaults	Description
Parity	None/ Even/ Odd/ Mark/ Space/	None	A parity bit can be sent with the data bits to detect some transmission errors. • None: No parity bits are sent. • Even: Parity bit is 0 if the number of 1s in the data bits is even. • Odd: Parity bit is 0 if the number of 1s in the data bits is odd. • Mark: Parity bit is always 1. • Space: Parity bit is always 0. Mark and Space parity do not allow for error detection. They can be used as an additional data bit.
Stop Bits	01/02	1	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning of a serial data packet.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Flow Control	None/ Hardware RTS/ CTS	None	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow control uses two wires to send start and stop RTS (request to send) and CTS (clear to send) signals.
TRUSTED COMPUTING			If you intend to use the Trusted Platform Module (TPM) feature set, you must configure the server to support TPM. The TPM feature is used by the OS for proof that the BIOS code has not been tampered with.

Setup Options	Options	Defaults	Description
TPM Support	Disabled/Enabled	Enabled	Enable or disable TPM support. Only UEFI BIOS implements this setup option. If disabled, the OS will not show TPM. Reset of the platform is required.
TPM State	Disabled/Enabled	Disabled	Displays whether TPM Support is enabled.
Current TPM Status Information (R/O)			If TPM Support is disabled, Current TPM Status displays "TPM SUPPORT OFF." If TPM Support is enabled, Current TPM Status displays: • TPM Enabled Status: • TPM Active Status: • TPM Owner Status:
NETWORK STACK			Configure network stack settings.
Network Stack	Disabled/Enabled	Enabled	Enable or disable the UEFI network stack.
Ipv4 PXE Support	Disabled/Enabled	Enabled	Enable or disable IPv4 PXE Boot support. If disable, the IPv4 Boot Option will not be created.
Ipv6 PXE Support	Disabled/Enabled	Disabled	Enable or disable IPv6 PXE Boot support. If disable, the IPv6 Boot Option will not be created.
BMC NETWORK			Configure Baseboard Management Controller (BMC) network parameters.
BMC Network: Current Active Management Port (R/O)			Active management port settings are displayed.
Refresh			Refresh current BMC network information with the latest information from the service processor.
Active Management Port	NETMGT/ NET0/ NET1/ NET2/ NET3		Change the management port that is currently active.

Setup Options	Options	Defaults	Description
Commit			Commit the current BMC network information.
IPv4 Configuration (R/O)			Current configuration of the IPv4 settings is displayed.
Channel Number (R/O)		1	Current channel number is displayed.
IPv4 Assignment (R/O)	Static/Dynamic	Static	View whether the service processor is assigned a static IPv4 address or assigned a dynamic IPv4 address using Dynamic Host Control Protocol (DHCP).
Current IPv4 Address in BMC (R/O)			Current IPv4 address of the service processor is displayed. Example: 172.31.255.255
Current IPv4 MAC Address in BMC (R/O)			Current IPv4 MAC address for the service processor is displayed. Example: 00:12:46:BE:0A:02
Current IPv4 Subnet Mask in BMC (R/O)			Current IPv4 subnet mask address for the service processor is displayed. Example: 255.255.255.0
Refresh			Select Refresh to update to the current settings.
IPv4 Address			If IPv4 Assignment is set to Static, set the IPv4 address for the service processor. Example: 172.31.255.255
IPv4 Subnet Mask			If the IPv4 Assignment is set to Static, set the IPv4 subnet mask. Example: 255.255.255.0
IPv4 Default Gateway			If the IPv4 Assignment is set to Static, set the IPv4 default gateway Example: 172.31.255.255
Commit			Commit the IPv4 configuration settings.

Setup Options	Options	Defaults	Description
IPv6 Configuration (R/O)	Static/Dynamic	Dynamic	Current configuration of the IPv6 settings is displayed. IPv6 addresses are written with hexadecimal digits and colon separators. For example: 2001:0db0:000:82a1:0000:0000:1234:abcd. IPv6 addresses are composed of two parts: a 64-bit subnet prefix and a 64-bit host interface ID. To shorten the IPv6 address, you can (1) omit all leading zeros, and (2) replace one consecutive group of zeros with a double colon (::). For example: 2001:db0:0:82a1::1234:abcd
Channel Number (R/O)		1	Current channel number is displayed.
Current IPv6 State (R/O)			Current IPv6 state is displayed.
Current IPv6 Auto Configuration (R/O)			Current IPv6 autoconfiguration parameters are displayed.
Link Local IPv6 Address (R/O)			Current link local IPv6 address is displayed. Example: fe80::214:4fff:feca:5f7e/64
Static IPv6 Address (R/O)			Current static IPv6 address is displayed. Example: 2001:0db0:000:82a1:0000:0000:1234:abcd
IPv6 Gateway (R/O)			Current IPv6 gateway address is displayed. Example: fe80::211:5dff:febe:5000/128
Dynamic IPv6 Address 1-*n* (R/O)			Current dynamic IPv6 addresses are displayed. Example: fec0:a:8:b7:214:4fff:feca:5f7e/64
Refresh			Select Refresh to update to the current settings.

TABLE: BIOS Advanced Menu Options *(Continued)*

Setup Options	Options	Defaults	Description
IPv6 State (R/O)	Disabled/Enabled		View whether the IPv6 state is enabled or disabled.
Auto IPv6 Configuration	Disabled/ Stateless/ Dhcpv6_stateless/ Dhcpv6_stateful	Disabled	Autoconfiguration options are: • Disabled: When autoconfiguration is disabled, only the Link Local address is set. None of the autoconfiguration options to configure an IPv6 address are run. • Stateless: When enabled, the IPv6 Stateless autoconfiguration is run to learn the IPv6 addresses for the device. • Dhcpv6_stateless: When enabled, the Dhcpv6_stateless autoconfiguration is run to learn the DNS and domain information for the device. • Dhcpv6_stateful: When enabled, the Dhcpv6_stateful autoconfiguration is run to learn the IP addresses and DNS information for the device.
Static IPv6 Address			Set the static IPv6 address. Example: 2001:0db0:000.82a1:0000:0000:1234:abcd
Commit			Commit the IPv6 configuration settings.

Related Information

- "BIOS Main Menu Selections" on page 198
- "BIOS IO Menu Selections" on page 213
- "BIOS Boot Menu Selections" on page 217
- "UEFI Driver Control Menu Selections" on page 221
- "BIOS Save & Exit Menu Selections" on page 225
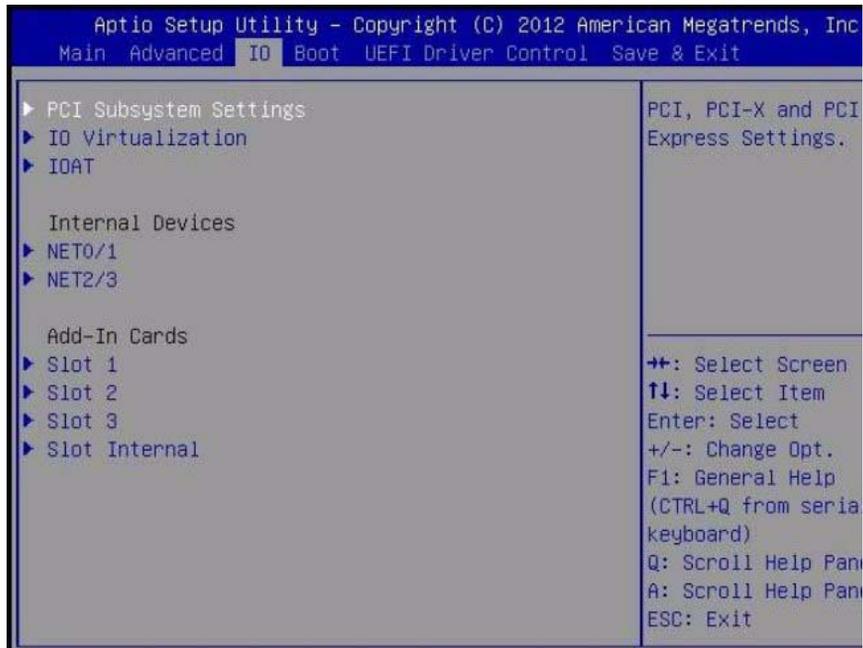
BIOS IO Menu Selections

This section includes a searchable text-based representation and a screenshot of the BIOS IO Menu. The options that are available from the IO Menu are described in the table that follows.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit
/-------------------------------------------------+----------------------\
|> PCI Subsystem Settings                         |PCI, PCI-X and PCI    |
|> IO Virtualization                              |Express Settings.     |
|> IOAT                                           |                      |
|                                                 |                      |
|  Internal Devices                               |                      |
|> NET0/1                                         |                      |
|> NET2/3                                         |                      |
|                                                 |                      |
|  Add-In Cards                                   |                      |
|> Slot 1                                         |----------------------|
|> Slot 2                                         |><: Select Screen     |
|> Slot 3                                         |^v: Select Item       |
|> Slot Internal                                  |Enter: Select         |
|>                                                |+/-: Change Opt.      |
|>                                                |F1: General Help      |
|                                                 |F7: Discard Changes   |
|                                                 |F9: Optimized Defaults|
|                                                 |F10: Save & Exit      |
|                                                 |ESC: Exit             |
 -------------------------------------------------+----------------------/
 Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

Note – PCIe slot 1 and Ethernet ports NET2 and NET3 are nonfunctional in single-processor systems.

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc
          Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

        ▶ PCI Subsystem Settings                      PCI, PCI-X and PCI
        ▶ IO Virtualization                           Express Settings.
        ▶ IOAT

          Internal Devices
        ▶ NET0/1
        ▶ NET2/3

          Add-In Cards
        ▶ Slot 1
        ▶ Slot 2                                      ↔: Select Screen
        ▶ Slot 3                                      ↑↓: Select Item
        ▶ Slot Internal                               Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      (CTRL+Q from seria
                                                      keyboard)
                                                      Q: Scroll Help Pan
                                                      A: Scroll Help Pan
                                                      ESC: Exit
```

TABLE: BIOS IO Menu Options

Setup Options	Options	Defaults	Description
PCI SUBSYSTEM SETTINGS			Configure PCI, PCI-X, and PCI Express settings.
PCI 64 Bit Resources Allocation	Disabled/Enabled	Enabled	Enable or disable 64-bit capable devices to be decoded in above 4G address space. This setting is available only if the system supports 64-bit decoding.
IO VIRTUALIZATION			Configure single root I/O virtualization settings.
VT-d	Disabled/Enabled	Enabled	Enable or disable Intel Virtualization Technology for directed I/O (VT-d). If enabled, ensures improved isolation of I/O resources for greater reliability, security, and availability.

Setup Options	Options	Defaults	Description
SR-IOV	Disabled/Enabled	Disabled	Single Root I/O Virtualization (SR-IOV) is used to configure devices into multiple virtual devices that can be used on virtual OS installations. If supported by the hardware and set to enabled, all devices within the system that are SR-IOV capable are configured to support SR-IOV and I/O resources are allocated to the device as normal. If set to disabled, I/O resources are not allocated to the device.
ARI	Disabled/Enabled	Disabled	If Alternate Routing ID (ARI) is supported by the hardware and set to enabled, devices are permitted to locate virtual functions (VFs) in function numbers 8 to 255 of the captured bus number, instead of normal function numbers 0 to 7.
I/OAT			Configure settings for the Intel I/O Acceleration Technology (I/OAT).
Intel I/OAT	Disabled/Enabled	Enabled	Enable or disable Intel I/OAT.
DCA Support	Disabled/Enabled	Enabled	Enable or disable direct cache access (DCA) support.
INTERNAL DEVICES			Configure settings for the embedded network controller.
NET0/1 OpROM Enable	Disabled/Enabled	Enabled	Enable or disable Option ROM. If set to enabled, Option ROM for the card executes as normal. If set to disabled, Option ROM for the card is not copied into memory and the execution of the Option ROM is inhibited.

Setup Options	Options	Defaults	Description
NET2 and NET3 OpROM Enable **Note -** Ethernet ports NET2 and NET3 are nonfunctional in single-processor systems.	Disabled/Enabled	Enabled	Enable or disable Option ROM. If set to enabled, Option ROM for the card executes as normal. If set to disabled, Option ROM for the card is not copied into memory and the execution of the Option ROM is inhibited.
ADD-IN CARDS			Enable or disable the add-in cards.
Slot 1 **Note -** PCIe slot 1 is nonfunctional in single-processor systems.			
IO Enable	Disabled/Enabled	Enabled	Enable or disable I/O for the add-in card.
OpROM Enable	Disable/Enabled	Enabled	Enable or disable Option ROM for add-in card.
Slot 2			
IO Enable	Disabled/Enabled	Enabled	Enable or disable I/O for the add-in card.
OpROM Enable	Disable/Enabled	Enabled	Enable or disable Option ROM for add-in card.
Slot 3			
IO Enable	Disabled/Enabled	Enabled	Enable or disable I/O for the add-in card.
OpROM Enable	Disable/Enabled	Enabled	Enable or disable Option ROM for add-in card.
Slot Internal	Disabled/enabled	Enabled	
IO Enable	Disabled/Enabled	Enabled	Enable or disable the I/O for the internal host bus adapter (HBA) card.
OpROM Enable	Disable/Enabled	Enabled	Enable or disable Option ROM for the internal host bus adapter (HBA) card.

Related Information

- "BIOS Main Menu Selections" on page 198
- "BIOS Advanced Menu Selections" on page 203

BIOS Boot Menu Selections

This section includes a searchable text-based representation and a screenshot of the BIOS Boot Menu. The options that are available from the Boot Menu are described in the table that follows.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit
/--------------------------------------------------+----------------------\
|  UEFI/BIOS Boot Mode       [Legacy BIOS]         |UEFI: Only UEFI Boot  |
|                                                  |options are initialized|
|  Retry Boot List           [Disabled]            |and present to user.  |
|  Network Boot Retry        [Enabled]             |Legacy BIOS: Only     |
|> OSA Configuration                               |legacy boot options are|
|                                                  |initialized and present|
|  Boot Option Priority                            |to user.              |
|  [PXE:NET0:IBA XE Slot 4000 v2193]               |                      |
|  [PXE:NET1:IBA XE Slot 4001 v2193]               |                      |
|  [PXE:NET2:IBA XE Slot 8800 v2193]               |----------------------|
|  [PXE:NET3:IBA XE Slot 8801 v2193]               |><: Select Screen     |
|                                                  |^v: Select Item       |
|                                                  |Enter: Select         |
|                                                  |+/-: Change Opt.      |
|                                                  |F1: General Help      |
|                                                  |F7: Discard Changes   |
|                                                  |F9: Optimized Defaults|
|                                                  |F10: Save & Exit      |
|                                                  |ESC: Exit             |
 --------------------------------------------------+----------------------/
 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
          Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
           Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

        UEFI/BIOS Boot Mode          [Legacy BIOS]           UEFI: Only UEFI Boot
                                                             options are initialized
        Retry Boot List              [Disabled]              and present to user.
        Network Boot Retry           [Enabled]               Legacy BIOS: Only
      ▶ OSA Configuration                                    legacy boot options are
                                                             initialized and present
        Boot Option Priority                                 to user.
        [PXE:NET0:IBA XE Slot 4000 v2193]
        [PXE:NET1:IBA XE Slot 4001 v2193]
        [PXE:NET2:IBA XE Slot 8800 v2193]
        [PXE:NET3:IBA XE Slot 8801 v2193]                  ▸◂: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

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                                                                          AB
```

TABLE: BIOS Boot Menu Options

Setup Options	Options	Defaults	Description
UEFI/BIOS Boot Mode	Legacy BIOS/UEFI	Legacy BIOS	Select either Legacy BIOS or UEFI BIOS as the boot mode. • Enable UEFI: Only UEFI BIOS boot options are initialized and presented to user. • Enable Legacy BIOS: Only Legacy BIOS boot options are initialized and presented to user.
Retry Boot List	Disabled/Enabled	Enabled	If enabled, BIOS automatically retries to boot from the top of the Boot Options Priority list when all devices have been attempted and failed.
Network Boot Retry	Disabled/Enabled	Enabled	If enabled, BIOS automatically retries the PXE list present in the system when all PXE attempts have failed. If set to disabled, the system halts and displays the error message "Network Boot Failed" when all PXE boots failed. If set to Boot List, fail over to the main Boot Options Priority list.

TABLE: BIOS Boot Menu Options *(Continued)*

Setup Options	Options	Defaults	Description
OSA Configuration			Configure whether the operating system recognizes Oracle System Assistant at boot.
OSA Internal Support	Disabled/Enabled	Enabled	Enable or disable the internal USB port for Oracle System Assistant boot. If enabled, the Oracle System Assistant media is recognized by the system. If disabled, the Oracle System Assistant media will not be recognized by the system.
Boot Option Priority			Set the system boot order. Example: [PXE:NET0:IBA XESlot 2000 v2193] [PXE:NET0:IBA XESlot 2001 v2193] [PXE:NET0:IBA XESlot 8800 v2193] [PXE:NET0:IBA XESlot 8801 v2193] [Disabled]

Related Information

UEFI Driver Control Menu Selections

This section includes a searchable text-based representation and a screenshot of the UEFI Driver Control Menu. The options that are available from the UEFI Driver Control Menu are described in the table that follows.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit
/-------------------------------------------------+----------------------\
|  iSCSI - ****************************************** |Configure the iSCSI |
|  Intel(R) Ethernet Controller 10 Gigabit X -      |parameters |
|  00:21:28:E7:74:CC |
|  Intel(R) Ethernet Controller 10 Gigabit X - |
|  00:21:28:E7:74:CD                               |                      |
|  LSI SAS2 MPT Controller SAS2008                 |                      |
|  (PCIDevId:0x72, PCIVendorId:0x1000,             |                      |
|  PCIBus:0x50, PCIDevice:0x0, PCIFunc:0x0,        |                      |
|  PCISlot:0x4)                                    |                      |
|  Intel(R) Ethernet Controller 10 Gigabit X -     |                      |
|  00:21:28:E7:74:CE                               |----------------------|
|  Intel(R) Ethernet Controller 10 Gigabit X -     |><: Select Screen     |
|  00:21:28:E7:74:CF                               |^v: Select Item       |
|                                                  |Enter: Select         |
|                                                  |+/-: Change Opt.      |
|                                                  |F1: General Help      |
|                                                  |F7: Discard Changes   |
|                                                  |F9: Optimized Defaults|
|                                                  |F10: Save & Exit      |
|                                                  |ESC: Exit             |
 -------------------------------------------------+----------------------/
 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit

    ▶ iSCSI                                      Configure the iSCSI
    ▶ Intel(R) Ethernet Controller 10 Gigabit X -  parameters.
      00:21:28:E7:74:06
    ▶ Intel(R) Ethernet Controller 10 Gigabit X -
      00:21:28:E7:74:07
    ▶ LSI SAS2 MPT Controller SAS2008
      (PCIDevId:0x72, PCIVendorId:0x1000,
      PCIBus:0x50, PCIDevice:0x0, PCIFunc:0x0,
      PCISlot:0x4)
    ▶ Intel(R) Ethernet Controller 10 Gigabit X -  ↔: Select Screen
      00:21:28:E7:74:08                            ↑↓: Select Item
    ▶ Intel(R) Ethernet Controller 10 Gigabit X -  Enter: Select
      00:21:28:E7:74:09                            +/-: Change Opt.
                                                   F1: General Help
                                                   (CTRL+Q from serial
                                                   keyboard)
                                                   Q: Scroll Help Pane Up
                                                   A: Scroll Help Pane Down
                                                   ESC: Exit

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```

TABLE: BIOS UEFI Driver Control Menu Options

Setup Options	Options	Default	Description
iSCSI Configuration	NA	NA	Select to configure the iSCSI initiator name parameters. Only available in UEFI BIOS mode.
iSCSI Initiator Name	NA (must be specified)	None	The worldwide unique name of the iSCSI Initiator. Only IQN format is accepted.
Add an Attempt	When this option is selected, a sub-menu with following options is presented.		
	• iSCSI Attempt Name	None	The human name that you assigned to this attempt.
	• iSCSI Mode	Disabled	Set to Enabled for multipath I/O (MPIO). MPIO can boost the performance of an application by load balancing traffic across multiple ports.

Setup Options	Options	Default	Description
Add an Attempt (Continued)	• Internet Protocol	IP4	Can be set to IP4, IP6, or Autoconfigure. The initiator IP address is assigned by the system to IP6. In Autoconfigure mode, the iSCSI driver attempts to connect to the iSCSI target using the IPv4 stack. If this fails, then the iSCSI driver attempt to connect using the IPv6 stack.
	• Connection Retry Count	0	The count range is 0 to 16. If set to 0, there are no retries.
	• Connection Establishing Timeout	1,000	The timeout value in milliseconds. The timeout range is 100 milliseconds to 20 seconds.
	• OUI-format ISID (R/O)	This valued derived from MAC address	OUI-format ISID represented in six bytes.
	• Configure ISID	The last three bytes of the OUI-format ISID	The default value is derived from the MAC address. Only this portion of the ISID is configurable.
	• Enable DHCP	Enabled	Enabled or disable.
	• Initiator IP Address	None	Use to set the initiator IP address.
	• Initiator Subnet Mask	None	Use to set initiator subnet mask address.
	• Gateway	None	Use to set initiator gateway address.
	• Target Name		Worldwide unique name of the target. Only IQN format is accepted.
	• Target IP address	None	Use to set target IP address
	• Target Port	3260	Use to change target port number.
	• Boot LUN	0	Use to set the hexadecimal representation of the boot logical unit number (LUN).

Setup Options	Options	Default	Description
Add an Attempt (Continued)	• Authentication Type	CHAP	Defines the Challenge-Handshake Authentication Protocol (CHAP)
	• CHAP Type	One Way	Use to set CHAP type to either One Way or Mutual.
	• CHAP Name	None	Use to set CHAP name.
	• CHAP Secret	None	Use to set the CHAP secret. The secret length range is 12 to 16 bytes.
Delete Attempts	NA	None	Use to delete one or more attempts.
Change Attempt Order	NA	None	Use to change the order of attempts.
Controller Management			Select to manage controller properties, to create or clear controller configurations, and to save or clear controller events.
View Controller Properties (R/O)			Select to view controller properties.
Change Controller Properties			Select to change controller properties.
Create Configuration			Use to specify RAID level and select physical disks.
Save Controller Events			Select to specify the file system, the directory and the file name to used to save controller events.
Physical Disk Management			Select to view properties and perform operations on physical disks.
View Physical Disk Properties (R/O)			Select to view physical disk properties
Select Physical Disk Operations			Select to manage physical disk operations
Port Configuration Menu			Select to set and display port configuration information.
NIC Configuration (R/O)			Select to view the network device port setting.
Blink LEDs	0 - 15	0	LEDs will blink for a specified duration (up to 15 seconds)
Port Configuration Information (R/O)			Displays the port settings for the network device.

Related Information

BIOS Save & Exit Menu Selections

This section includes a searchable text-based representation and a screenshot of the BIOS Save & Exit Menu. The options that are available from the Save & Exit Menu are described in the table that follows.

```
 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Main  Advanced  IO  Boot  UEFI Driver Control  Save & Exit
/------------------------------------------------------+----------------------\
|  Save Changes and Reset                              |Reset the system after |
|  Discard Changes and Exit                            |saving the changes.     |
|  Discard Changes                                     |                        |
|  Restore Defaults                                    |                        |
|                                                      |                        |
|                                                      |                        |
|                                                      |                        |
|                                                      |                        |
|                                                      |                        |
|                                                      |------------------------|
|                                                      |><: Select Screen       |
|                                                      |^v: Select Item         |
|                                                      |Enter: Select           |
|                                                      |+/-: Change Opt.        |
|                                                      |F1: General Help        |
|                                                      |F7: Discard Changes     |
|                                                      |F9: Optimized Defaults  |
|                                                      |F10: Save & Exit        |
|                                                      |ESC: Exit               |
 ------------------------------------------------------+----------------------/
 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
          Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Main  Advanced  IO  Boot  UEFI Driver Control   Save & Exit

          Save Changes and Reset                        Reset the system after
          Discard Changes and Exit                      saving the changes.
          Discard Changes
          Restore Defaults




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F7: Discard Changes
                                                         F9: Optimized Defaults
                                                         F10: Save & Exit
                                                         ESC: Exit

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                                                                          AB
```

TABLE: BIOS Save & Exit Menu Options

Setup Options	Description
Save Changes and Reset	Save changes and then reset the system.
Discard Changes and Exit	Exit the BIOS Setup Utility without saving any changes.
Discard Changes	Discard changes made to the setup options so far.
Restore Defaults	Restore and load all default setup options for BIOS.

Related Information

- "BIOS Main Menu Selections" on page 198
- "BIOS Advanced Menu Selections" on page 203
- "BIOS IO Menu Selections" on page 213
- "BIOS Boot Menu Selections" on page 217
- "UEFI Driver Control Menu Selections" on page 221

Monitoring Components and Identifying SNMP Messages

This section includes information about monitoring components and identifying SNMP messages for the Sun Server X4-2.

The following sections are discussed.

Description	Links
Review how Oracle ILOM monitors component health and faults.	"Monitoring Component Health and Faults Using Oracle ILOM" on page 227
Review information about system components and nomenclature.	"Monitoring System Components" on page 228
Review SNMP traps generated by the server.	"Identifying SNMP Trap Messages" on page 239

Related Information

■ Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
   http://www.oracle.com/goto/ILOM/docs

Monitoring Component Health and Faults Using Oracle ILOM

The Oracle ILOM 3.1 interfaces provide easy-to-view information about the health status of system components. From the Oracle ILOM web interface or the /System target in the Oracle ILOM command-line interface, you can collect system-specific information about the server, determine the health state of discrete components, and view any open problems on the server. Oracle ILOM automatically detects system hardware faults and environmental conditions on the server. If a problem occurs on the server, Oracle ILOM will automatically do the following:

- Illuminate the Service Required status indicator (LED) on the server front and back panels.
- Identify the faulted component in the Open Problems table.
- Record system information about the faulted component or condition in the event log.

For further information about administering open problems that are detected and reported by Oracle ILOM, refer to "Administering Open Problems" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide*.

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: http://www.oracle.com/goto/ILOM/docs

Monitoring System Components

The tables in this section identify the system components and describe the naming conventions applied to the components of the Sun Server X4-2.

Each section corresponds to an IPMI entity ID and lists sensors, indicators, and field-replaceable units (FRUs) related to that entity. The tables contain the following fields:

- **Component Name** – Shows the user-visible component name used in management interfaces to refer to a specific sensor, indicator, or FRU. The IPMI name is a shortened form of the component name, and is indicated by the **boldface** portion of the component name.
- **IPMI Type** – Indicates the type of sensor, indicator, or FRU represented.
- **Description** – Describes of this particular component name reference.
- **Values** – Defines the states of the sensor, indicator, or FRU entity, and any specific units or values that are expected, if applicable.

Note – Some component names are hidden in the Oracle ILOM user interfaces. These names are marked as hidden in the following tables. Further, as of Oracle ILOM 3.1, the Oracle ILOM 3.0 legacy targets `/SYS` and `/STORAGE` have been replaced by `/System`. Even though these legacy targets might be hidden, you can still use them to issue commands. For information on legacy targets, see the ILOM 3.1 Documentation Library at http://www.oracle.com/goto/ILOM/docs.

This section includes information for the following server components:

System Chassis Components

The following table lists the system chassis components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/**SYS**	FRU	General host FRU	
/SYS/**UUID**	FRU	Unique system ID	Derived from host MAC address. Use for PXE boot and licensing.
/SYS/**ACPI**	State sensor	Precondition for sensors that need to know if the host is on	(*hidden*) 01h-ACPI_ON_WORKING 20h-ACPI_SOFT_OFF
/SYS/**PWRBS**	Discrete sensor	Power budget status	01h-DEASSERTED 02h-ASSERTED
/SYS/**VPS**	Threshold sensor	Virtual power sensor	Watts
/SYS/**VPS_CPUS**	Threshold sensor	Virtual power sensor (CPUs)	Watts
/SYS/**VPS_MEMORY**	Threshold sensor	Virtual power sensor (Memory)	Watts
/SYS/**VPS_FANS**	Threshold sensor	Virtual power sensor (Fans)	Watts
/SYS/**INTSW**	Discrete sensor	Chassis intrusion switch	01h-DEASSERTED 02h-ASSERTED

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**T_AMB**	Threshold sensor	System ambient temperature	Degrees C
/SYS/**TEMP_FAULT**	Indicator	Temperature Fault LED	Color: Amber Location: Mainboard Off: Normal On: Chassis overtemp fault
/SYS/**OK**	Indicator	OK LED	Color: Green Location: Front panel Off: Power is off. Fast blink: SP is booting. Slow blink: Host is in BIOS. On: Host is booting OS.
/SYS/**SERVICE**	Indicator	Service Required LED	Color: Amber Location: Front panel Off: Server is normal. On: Server requires service.
/SYS/**LOCATE**	Indicator	Locator LED	Color: White Location: Front and rear panels Off: Normal Fast blink: Locate function is activated; self-extinguishes after 30 minutes.
/SYS/**HOST_ERR**	Discrete sensor	Writable digital, OEM reserved sensor type, per IPMI	0x02: asserts SYS/SERVICE 0x01: deasserts SYS/SERVICE
/SYS/**PS_FAULT**	Indicator Rear	Power Supply Fault LED	Color: Amber Location: Mainboard Off: Normal On: General power supply fault
/SYS/**FAN_FAULT**	Indicator	Top Fan Fault LED	Color: Amber Location: Mainboard Off: Normal On: General fan fault

Related Information

Cooling Unit Components

The system has 1.57-inch (40-mm) fan modules with two fans in each module. The following table lists the system cooling unit components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/FM[0-3]**	FRU	Fan module FRU	
/SYS/**MB/FM[0-3]/PRSNT**	Discrete sensor	Fan module is present.	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT
/SYS/**MB/FM[0-3]/F[0-1]/TACH**	Threshold sensor	Fan module fan speed	RPM
/SYS/**MB/FM[0-3]/SERVICE**	Indicator	Fan Service Required LED	Color: Amber Location: Mainboard Off: Normal On: Fan module was diagnosed as faulty.
/SYS/**MB/FM[0-3]/OK**	Indicator	Fan Module OK LED	Color: Green Location: Mainboard On: Normal Off: Fan module is offline.

Related Information

Disk Backplane Components

The following table lists the disk backplane (DBP) components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description
/SYS/**DBP[0-2]**	FRU	Disk backplane FRUs for a multiple DBP configuration
/SYS/**DBP**	FRU	Disk backplane FRU for a single DBP configuration

Related Information

Memory Device Components

The following table lists the memory device components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/P[0-1]/D[0-7]**	FRU	Host CPU DIMM FRU	

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/P[0-1]/D[0-7]/PRSNT**	Discrete sensor	Host CPU DIMM is present.	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT
/SYS/**MB/P[0-1]/D[0-7]/SERVICE**	Indicator	Host CPU DIMM Service LED	Color: Amber Location: Mainboard Off: Normal On: DIMM is diagnosed as faulty.

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232
- "Power Unit Components" on page 233
- "Processor Components" on page 235
- "System Board Components" on page 235
- "System Firmware Components" on page 237
- "Hard Disk Drive Components" on page 238

Power Unit Components

The following table lists the power unit components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**PS[0-1]**	FRU	Power supply FRU	
/SYS/**PS[0-1]/PRSNT**	Discrete sensor	Power supply is present.	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**PS[0-1]/STATE**	Discrete sensor	Multistate, power supply sensor type, per IPMI	Presence detected Failure detected Predictive failure Power supply input lost Power supply input lost or out-of-range Power supply input out-of-range Configuration error
/SYS/**PS[0-1]/P_IN**	Power sensor	Input power draw	Watts
/SYS/**PS[0-1]/P_OUT**	Power sensor	Output power	Watts
/SYS/**PS[0-1]/V_IN**	Voltage sensor	Input voltage	Volts
/SYS/**PS[0-1]/V_12V**	Voltage sensor	12V rail voltage	Volts
/SYS/**PS[0-1]/V_3V3**	Voltage sensor	3.3V rail voltage	Volts
/SYS/**PS[0-1]/T_OUT**	Temperature sensor	Ambient temperature	Degrees C

Related Information

Processor Components

The following table lists the processor (CPU) components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/P[0-1]**	FRU	Host CPU FRU	
/SYS/**MB/P[0-1]/PRSNT**	Discrete sensor	Host CPU is present.	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT
/SYS/**MB/P[0-1]/SERVICE**	Indicator	Host CPU Service LED	Color: Amber Location: Mainboard Off: Normal On: Processor was diagnosed as faulty.
/SYS/**MB/P[0-1]/V_DIMM**	Static sensor	CPU's DIMM bank operating voltage	LVDIMM = 1.3V non-LVDIMM = 1.5V

Related Information

System Board Components

The following table lists the system board components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB**	FRU	General host system board FRU	
/SYS/**MB/NET[0-3]**	FRU	Host Ethernet FRU	

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/PCIE[1-6]/PRSNT**	Discrete sensor	Option card inserted into PCIe slot	01h-ENTITY_PRESENT, 02h-ENTITY_PRESENT
/SYS/**MB/T_OUT_ZONE[0-2]**	Threshold sensor	Cooling zone exhaust temperature	Degrees C
/SYS/**MB/T_IN_ZONE[0-2]**	Threshold sensor	Cooling zone inlet temperature	Degrees C
/SYS/**MB/T_CORE_NET01**, /SYS/**MB/T_CORE_NET23**	Threshold sensor	Gigabit Ethernet controller die temperature	Degrees C
/SYS/**MB/T_IN_PS[0,1]**	Threshold sensor	PSU inlet temperature	Degrees C
/SYS/**MB/SASEXP**	FRU	SAS expander FRU	
/SYS/**MB/SASEXP/PRSNT**	Discrete sensor	SAS expander board presence	01h-ENTITY_PRESENT, 02h-ENTITY_PRESENT
/SYS/**MB/SASEXP/T_CORE**	Threshold sensor	SAS expander board temperature	Degrees C
/SYS/**MB/RIO**	FRU	Rear I/O board	
/SYS/**MB/RIO/PRSNT**	Discrete sensor	Rear I/O board presence	01h-ENTITY_PRESENT, 02h-ENTITY_PRESENT
/SYS/**MB/CONNBD**	FRU	Connector board on QPI bridge	
/SYS/**MB/CONNBD/PRSNT**	Discrete sensor	Connector board presence	01h-ENTITY_PRESENT, 02h-ENTITY_PRESENT
/SYS/**SP**	FRU	Service processor FRU	
/SYS/**SP/OK**	Indicator	SP OK LED	Color: Green Location: Front panel On: SP is operating.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**SP/SERVICE**	Indicator	SP Service Required LED	Color: Amber Location: Front panel Off: SP is working properly. On: SP requires service.
/SYS/**SP/NET[0-1]**	FRU	SP Ethernet FRU	

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232
- "Memory Device Components" on page 232
- "Power Unit Components" on page 233
- "Processor Components" on page 235
- "System Firmware Components" on page 237
- "Hard Disk Drive Components" on page 238

System Firmware Components

The following table lists the system firmware components.

Component Name (Oracle ILOM CLI Target)	IPMI Type	Description
/SYS/**MB/BIOS**	FRU	BIOS FRU

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232
- "Memory Device Components" on page 232
- "Power Unit Components" on page 233
- "Processor Components" on page 235

Hard Disk Drive Components

The following table lists the hard disk drive (HDD) components.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**MB/RHDD[0-1]**	FRU	Rear hard disk drive FRU	From host
/SYS/**MB/RHDD[0-1]/PRSNT**	Discrete sensor	Rear hard disk drive presence	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT
/SYS/**MB/RHDD[0-1]/SERVICE**	Indicator	Rear hard disk drive Service Required LED	Color: Amber Location: Rear HDD On: Hard disk drive was diagnosed as faulty.
/SYS/**MB/RHDD[0-1]/OK2RM**	Indicator	Rear hard disk drive OK to Remove LED	Color: Blue Location: Rear HDD Off: Normal On: Ready to remove
/SYS/**MB/RHDD[0-1]/STATE**	Discrete sensor	Writable multistate, slot/connector sensor type, per IPMI	FAULT: Asserts SERVICE IDENTIFY: Blinks OK2RM OK2RM: Asserts OK2RM
/SYS/**DBP[0-2]/HDD[0-x]**	FRU	Hard disk drive FRU	From host
/SYS/**DBP[0-2]/HDD[0-y]/PRSNT**	Discrete sensor	Hard disk drive presence	01h-ENTITY_PRESENT, 02h-ENTITY_ABSENT
/SYS/**DBP[0-2]/HDD[0-y]/SERVICE**	Indicator	Hard disk drive Service Action LED	Color: Amber Location: HDD Off: Normal On: Hard disk drive was diagnosed as faulty.

Component Name (Oracle ILOM CLI Targets)	IPMI Type	Description	Values (if applicable)
/SYS/**DBP[0-2]/HDD[0-y]/OK2RM**	Indicator	Hard disk drive OK to Remove LED	Color: Blue Location: HDD Off: Normal On: Ready to remove
/SYS/**DBP[0-2]/HDD[0-y]/STATE**	Discrete sensor	Writable multistate, slot/connect or sensor type, per IPMI	FAULT: Asserts SERVICE IDENTIFY: Blinks OK2RM OK2RM: Asserts OK2RM

Related Information

Identifying SNMP Trap Messages

It is possible to configure Oracle ILOM to generate Simple Network Management Protocol (SNMP) traps when hardware problems occur. For information about how to configure SNMP alert rule destinations to start receiving these traps, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:

http://www.oracle.com/goto/ILOM/docs

The tables in these sections list the set of SNMP traps that are generated from Oracle ILOM:

Generic Host Events

The following table lists generic host events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** Assert **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/HOST_ERR
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** Deassert **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/HOST_ERR

Related Information

Environmental Events

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapTempFatalThresholdExceeded **Oracle ILOM Message:** Lower fatal threshold exceeded **Severity and Description:** Critical; A temperature sensor has reported that its value has gone above an upper fatal threshold setting or below a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/PS0/T_OUT /SYS/PS1/T_OUT /SYS/MB/T_IN_ZONE0 /SYS/MB/T_OUT_ZONE0 /SYS/MB/T_IN_ZONE1 /SYS/MB/T_OUT_ZONE1 /SYS/MB/T_IN_ZONE2 /SYS/MB/T_OUT_ZONE2
SNMP Message: sunHwTrapTempFatalThresholdDeasserted **Oracle ILOM Message:** Lower fatal threshold no longer exceeded **Severity and Description:** Informational; A temperature sensor has reported that its value has gone below an upper fatal threshold setting or above a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/PS0/T_OUT /SYS/PS1/T_OUT /SYS/MB/T_IN_ZONE0 /SYS/MB/T_OUT_ZONE0 /SYS/MB/T_IN_ZONE1 /SYS/MB/T_OUT_ZONE1 /SYS/MB/T_IN_ZONE2 /SYS/MB/T_OUT_ZONE2
SNMP Message: sunHwTrapTempFatalThresholdExceeded **Oracle ILOM Message:** Upper fatal threshold exceeded **Severity and Description:** Critical; A temperature sensor has reported that its value has gone above an upper fatal threshold setting or below a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/PS0/T_OUT /SYS/PS1/T_OUT /SYS/MB/T_IN_ZONE0 /SYS/MB/T_OUT_ZONE0 /SYS/MB/T_IN_ZONE1 /SYS/MB/T_OUT_ZONE1 /SYS/MB/T_IN_ZONE2 /SYS/MB/T_OUT_ZONE2
SNMP Message: sunHwTrapTempFatalThresholdDeasserted **Oracle ILOM Message:** Upper fatal threshold no longer exceeded **Severity and Description:** Informational; A temperature sensor has reported that its value has gone below an upper fatal threshold setting or above a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/PS0/T_OUT /SYS/PS1/T_OUT /SYS/MB/T_IN_ZONE0 /SYS/MB/T_OUT_ZONE0 /SYS/MB/T_IN_ZONE1 /SYS/MB/T_OUT_ZONE1 /SYS/MB/T_IN_ZONE2 /SYS/MB/T_OUT_ZONE2
SNMP Message: sunHwTrapTempFatalThresholdExceeded **Oracle ILOM Message:** Lower fatal threshold exceeded **Severity and Description:** Critical; A temperature sensor has reported that its value has gone above an upper fatal threshold setting or below a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/T_AMB /SYS/MB/T_CORE_NET01 /SYS/MB/T_CORE_NET23 /SYS/MB/T_IN_PS0 /SYS/MB/T_IN_PS1

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapTempFatalThresholdDeasserted **Oracle ILOM Message:** Lower fatal threshold no longer exceeded **Severity and Description:** Informational; A temperature sensor has reported that its value has gone below an upper fatal threshold setting or above a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/T_AMB /SYS/MB/T_CORE_NET01 /SYS/MB/T_CORE_NET23 /SYS/MB/T_IN_PS0 /SYS/MB/T_IN_PS1
SNMP Message: sunHwTrapTempFatalThresholdExceeded **Oracle ILOM Message:** Upper fatal threshold exceeded **Severity and Description:** Critical; A temperature sensor has reported that its value has gone above an upper fatal threshold setting or below a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/T_CORE_NET01 /SYS/MB/T_CORE_NET23 /SYS/MB/T_IN_PS0 /SYS/MB/T_IN_PS1
SNMP Message: sunHwTrapTempFatalThresholdDeasserted **Oracle ILOM Message:** Upper fatal threshold no longer exceeded **Severity and Description:** Informational; A temperature sensor has reported that its value has gone below an upper fatal threshold setting or above a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/T_CORE_NET01 /SYS/MB/T_CORE_NET23 /SYS/MB/T_IN_PS0 /SYS/MB/T_IN_PS1

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232
- "Memory Device Components" on page 232
- "Power Unit Components" on page 233
- "Processor Components" on page 235
- "System Board Components" on page 235
- "Hard Disk Drive Components" on page 238

Hard Disk Drive Events

The following table lists hard disk drive events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapSlotOrConnectorError **Oracle ILOM Message:** Assert **Severity and Description:** Major; A sensor associated with a slot or connector has detected an error.	/SYS/DBP/HDD0/STATE /SYS/DBP/HDD1/STATE /SYS/DBP/HDD2/STATE /SYS/DBP/HDD3/STATE /SYS/DBP/HDD4/STATE /SYS/DBP/HDD5/STATE /SYS/DBP/HDD6/STATE /SYS/DBP/HDD7/STATE
SNMP Message: sunHwTrapSlotOrConnectorOk **Oracle ILOM Message:** Dessert **Severity and Description:** Informational; A sensor associated with a slot or connector has returned to its normal state.	/SYS/DBP/HDD0/STATE /SYS/DBP/HDD1/STATE /SYS/DBP/HDD2/STATE /SYS/DBP/HDD3/STATE /SYS/DBP/HDD4/STATE /SYS/DBP/HDD5/STATE /SYS/DBP/HDD6/STATE /SYS/DBP/HDD7/STATE

Related Information

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Power Events

The following table lists power events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** Assert **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/POLL /SYS/PS1/POLL
SNMP Message: sunHwTrapPowerSupplyOk **Oracle ILOM Message:** Deassert **Severity and Description:** Informational; A power supply sensor has returned to its normal state.	/SYS/PS0/POLL /SYS/PS1/POLL
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_PRESENCE ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_PRESENCE DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_FAILURE ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_FAILURE DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_PREDICTIVE_FAILURE ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_PREDICTIVE_FAILURE DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_LOST ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_LOST DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_ERROR ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_ERROR DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_RANGE_ERROR ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_INPUT_RANGE_ERROR DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_CONFIG_ERROR ASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** PS_CONFIG_ERROR DEASSERT **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PS0/STATE /SYS/PS1/STATE
SNMP Message: sunHwTrapSensorNonCritThresholdExceeded **Oracle ILOM Message:** Upper noncritical threshold exceeded **Severity and Description:** Minor; A sensor has reported that its value has gone above an upper non-critical threshold setting or below a lower non-critical threshold setting. This generic 'sensor' trap is generated when the SNMP agent does not recognize the component type. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/VPS
SNMP Message: sunHwTrapSensorThresholdOk **Oracle ILOM Message:** Upper noncritical threshold no longer exceeded **Severity and Description:** Informational; A sensor has reported that its value is in the normal operating range. The generic 'sensor' trap is generated when the SNMP agent does not recognize the component type.	/SYS/VPS
SNMP Message: sunHwTrapPowerSupplyError **Oracle ILOM Message:** Assert **Severity and Description:** Major; A power supply sensor has detected an error.	/SYS/PWRBS
SNMP Message: sunHwTrapPowerSupplyOk **Oracle ILOM Message:** Deassert **Severity and Description:** Informational; A power supply sensor has returned to its normal state.	/SYS/PWRBS
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ACPI_ON_WORKING ASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/ACPI

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ACPI_ON_WORKING DEASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/ACPI
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ACPI_SOFT_OFF ASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/ACPI
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ACPI_SOFT_OFF DEASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/ACPI

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232
- "Memory Device Components" on page 232
- "Power Unit Components" on page 233
- "Processor Components" on page 235
- "System Board Components" on page 235
- "Hard Disk Drive Components" on page 238

Fan Events

The following table lists fan events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapFanSpeedCritThresholdExceeded **Oracle ILOM Message:** Lower critical threshold exceeded **Severity and Description:** Major; A fan speed sensor has reported that its value has gone above an upper critical threshold setting or below a lower critical threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/FM0/F0/TACH /SYS/MB/FM0/F1/TACH /SYS/MB/FM1/F0/TACH /SYS/MB/FM1/F1/TACH /SYS/MB/FM2/F0/TACH /SYS/MB/FM2/F1/TACH /SYS/MB/FM3/F0/TACH /SYS/MB/FM3/F1/TACH
SNMP Message: sunHwTrapFanSpeedCritThresholdDeasserted **Oracle ILOM Message:** Lower critical threshold no longer exceeded **Severity and Description:** Informational; A fan speed sensor has reported that its value has gone below an upper critical threshold setting or above a lower critical threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/FM0/F0/TACH /SYS/MB/FM0/F1/TACH /SYS/MB/FM1/F0/TACH /SYS/MB/FM1/F1/TACH /SYS/MB/FM2/F0/TACH /SYS/MB/FM2/F1/TACH /SYS/MB/FM3/F0/TACH /SYS/MB/FM3/F1/TACH
SNMP Message: sunHwTrapFanSpeedFatalThresholdExceeded **Oracle ILOM Message:** Lower fatal threshold exceeded **Severity and Description:** Critical; A fan speed sensor has reported that its value has gone above an upper fatal threshold setting or below a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/FM0/F0/TACH /SYS/MB/FM0/F1/TACH /SYS/MB/FM1/F0/TACH /SYS/MB/FM1/F1/TACH /SYS/MB/FM2/F0/TACH /SYS/MB/FM2/F1/TACH /SYS/MB/FM3/F0/TACH /SYS/MB/FM3/F1/TACH
SNMP Message: sunHwTrapFanSpeedFatalThresholdDeasserted **Oracle ILOM Message:** Lower fatal threshold no longer exceeded **Severity and Description:** Informational; A fan speed sensor has reported that its value has gone below an upper fatal threshold setting or above a lower fatal threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower threshold.	/SYS/MB/FM0/F0/TACH /SYS/MB/FM0/F1/TACH /SYS/MB/FM1/F0/TACH /SYS/MB/FM1/F1/TACH /SYS/MB/FM2/F0/TACH /SYS/MB/FM2/F1/TACH /SYS/MB/FM3/F0/TACH /SYS/MB/FM3/F1/TACH

Related Information

- "System Chassis Components" on page 229
- "Cooling Unit Components" on page 231
- "Disk Backplane Components" on page 232

Memory Events

The following table lists memory events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapSensorNonCritThresholdExceeded **Oracle ILOM Message:** Upper noncritical threshold exceeded **Severity and Description:** Minor; A sensor has reported that its value has gone above an upper non-critical threshold setting or below a lower non-critical threshold setting. This generic 'sensor' trap is generated when the SNMP agent does not recognize the component type. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower.	/SYS/VPS_CPUS /SYS/VPS_MEMORY
SNMP Message: sunHwTrapSensorThresholdOk **Oracle ILOM Message:** Upper noncritical threshold no longer exceeded **Severity and Description:** Informational; A sensor has reported that its value is in the normal operating range. This generic 'sensor' trap is generated when the SNMP agent does not recognize the component type.	/SYS/VPS_CPUS /SYS/VPS_MEMORY
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.cpu.intel.quickpath.link_slow **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.cpu.intel.quickpath.link_slow **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.cpu.intel.quickpath.unknown-errcode **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.cpu.intel.quickpath.unknown-errcode **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.memory.intel.dimm.none **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.none **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.memory.intel.dimm.memtest-failed **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.memtest-failed **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.memory.intel.dimm.quadrank-3rd-slot **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.quadrank-3rd-slot **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.memory.intel.dimm.ddr3u-unsupported **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.ddr3u-unsupported **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFault **Oracle ILOM Message:** event fault.memory.intel.mrc.unknown-errcode **Severity and Description:** Major; A component is suspected of causing a fault. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapComponentFaultCleared **Oracle ILOM Message:** event fault.memory.intel.mrc.unknown-errcode **Severity and Description:** Informational; A component fault has been cleared. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.udimm-unsupported **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.udimm-unsupported **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.sodimm-unsupported **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.sodimm-unsupported **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.4gb-fused **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.4gb-fused **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.8gb-fused **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.8gb-fused **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible-maxranks **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible-maxranks **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible-quadrank **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.incompatible-quadrank **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.numranks-unsupported **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.numranks-unsupported **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.speed-slow **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.speed-slow **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.disable-quadrank **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.disable-quadrank **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.population-invalid **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.population-invalid **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.out-of-order **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.out-of-order **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFault **Oracle ILOM Message:** event fault.memory.intel.dimm.category-unknown **Severity and Description:** Major; A memory component is suspected of causing a fault.	/SYS/MB/P/D
SNMP Message: sunHwTrapMemoryFaultCleared **Oracle ILOM Message:** event fault.memory.intel.dimm.category-unknown **Severity and Description:** Informational; A memory component fault has been cleared.	/SYS/MB/P/D

Related Information

Entity Presence Events

The following table lists entity presence events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_PRESENT ASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_PRESENT DEASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_ABSENT ASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_ABSENT DEASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_DISABLED ASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT
SNMP Message: sunHwTrapComponentError **Oracle ILOM Message:** ENTITY_DISABLED DEASSERT **Severity and Description:** Major; A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.	/SYS/MB/P0/PRSNT /SYS/MB/P1/PRSNT

Related Information

Physical Presence Events

The following table lists physical presence events.

Messages and Descriptions	Sensor Name
SNMP Message: sunHwTrapSecurityIntrusion	/SYS/INTSW
Oracle ILOM Message: Assert	/SYS/SP/SP_NEEDS_R
Severity and Description: Major; An intrusion sensor has detected that someone may have physically tampered with the system.	EBOOT
SNMP Message: sunHwTrapSecurityIntrusion	/SYS/INTSW
Oracle ILOM Message: Deassert	/SYS/SP/SP_NEEDS_R
Severity and Description: Major; An intrusion sensor has detected that someone may have physically tampered with the system.	EBOOT

Related Information

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