Oracle® Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Server X2-8 (formerly Sun Fire X4800 M2)

ORACLE®

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Contents

Using This Documentation

This section provides product information, documentation and feedback links, and a document change history.

Sun Server X2-8 Name Change

The Sun Server X2-8 was formerly named the Sun Fire X4800 M2 server. This former name might still appear in the software. The name change does not indicate any change in system features or functionality.

The new name identifies the following:

- X identifies an x86 product.
- The first number, 2, identifies the generation of the server.
- The second number, 8, identifies the number of processors.

Product Downloads

You can find downloads for all Oracle x86 servers and server modules (blades) on My Oracle Support (MOS). On MOS you can find two type of downloads:

- Software release bundles specific to the rackmount server, server module, modular system (blade chassis), or NEM. These software release bundles include Oracle ILOM, Oracle Hardware Installation Assistant and other platform software and firmware.

- Standalone software common across multiple types of hardware. This includes the Hardware Management Pack.

▼ Get Software and Firmware Downloads

1 Go to `http://support.oracle.com`.

2 Sign in to My Oracle Support.

The Patches and Updates screen appears.

3 At the top of the page, click the Patches and Updates tab.

Search fields appear.

4 In the Patch Search box, click Product or Family (Advanced Search).

Alternatively, type a full or partial product name (for example Sun Server X2–8) until a match appears.

5 In the Release pull-down list, select the release from the drop-down list.

Expand the folders to see component offerings.

6 Click Search.

A list of updates (patches) appears.

7 To select a patch, click the check boxes next to the patch name (you can select more than one patch).

A popup action panel appears. The panel lists several action options.

8 To download the update, click Download in the popup panel.

The download appears automatically.

Documentation and Feedback

Documentation	Link
All Oracle products	`http://www.oracle.com/documentation`
Sun Server X2-8	`http://www.oracle.com/pls/topic/lookup?ctx=sfx4800m2`
Oracle ILOM 3.0	`http://www.oracle.com/goto/ILOM/docs`

Provide feedback on this documentation at: `http://www.oracle.com/goto/docfeedback`.

About This Documentation

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

You can get a PDF that includes all information about a particular topic subject (such as hardware installation or product notes) by clicking the PDF button on the top of the page.

Change History

The following lists the release history of this documentation set:

- July 2011 – Initial publication.
- October 2011 – Revised for SW1.1.
- April 2012 – Revised to add preinstalled Oracle VM, and additional rack mounting instructions.
- June 2012 – Revided for SW1.1.1. Revised to add the preinstalled Oracle Solaris 11 operating system.
- July 2012 – Revised to change the product name to Sun Server X2–8 and to add 32 GB DIMM support.
- September 2012 – Added firmware versions to Product Notes.
- December 2012 – Revised for SW1.1.2. Added support for dual-ranked and quad-ranked 16 GB DIMMs.
- December 2012 – Removed erroneous listing of Windows Server 2008 pre-R2 as a supported OS. For Microsoft Windows, only Windows Server 2008 R2 SP1 is supported.
- January 2013 – Minor edit to Service Manual and Product Notes for memory DIMM population rules.
- January 2013 – Minor editorial corrections to Product Notes and Service Manual.
- March 2013 – Support for Windows Server 2012 added to Product Notes. Installation Guide revised to add the preinstalled Oracle Linux operating system.
- July 2013 – Revised for SW1.2. Updated information in Product Notes on operating system support, finding Windows Server 2008 drivers, and new CRs. Updated Service Manual to add procedure animation links and make minor editorial changes.
- August 2013 – Revised Installation Guide and Oracle ILOM Supplement to add information about changing the default Oracle ILOM password.

Determining Your Server Management Strategy

Note – If you want to perform server management functions *across several servers* simultaneously, you might want to use Oracle Enterprise Manager Ops Center, which you can order from Oracle. Refer to the Oracle Enterprise Manager Ops Center product information at:

http://www.oracle.com/us/products/enterprise-manager/opscenter/index.html

Note – The Sun Server X2-8 was formerly named the Sun Fire X4800 M2 server. This former name might still appear in the product. The name change does not indicate any change in system features or functionality.

With your Oracle x86 server, you have three single-server management options available. They are:

- Oracle Integrated Lights Out Manager (ILOM)
- Oracle Hardware Management Pack
- Oracle Hardware Installation Assistant

Each of these server management options has unique capabilities, but some of the functions of the tools overlap. Each of these software options is freely available and can be used together.

This section includes information to help you evaluate the single-server management solution that best fits your server environment and the management tasks that you can perform. It also provides information about how to access the software and documentation.

These topics are discussed in this section:

Description	Link
View a list of common server management functions to see which is available with each tool.	"Common Server Management Tasks" on page 10

Description	Link
Review the major benefits of each server management option.	"Server Management Software Benefits" on page 10 ■ "Oracle Integrated Lights Out Manager" on page 11 ■ "Oracle Hardware Management Pack" on page 12 ■ "Oracle Hardware Installation Assistant" on page 13
Evaluate your server environment to determine which option fits your situation.	"Evaluating Your Server Environment" on page 14
Access server management software and documentation.	"Server Management Downloads and Documentation" on page 16

Common Server Management Tasks

The following table gives examples of common server management tasks that you can perform with the available single-server management software.

Task	Oracle Integrated Lights Out Manager	Oracle Hardware Management Pack	Oracle Hardware Installation Assistant
Update BIOS or ILOM firmware	Yes	No	Yes
Configure ILOM	Yes	Yes	Yes
Install Linux or Windows operating system and drivers	No	No	Yes
Monitor hardware components	Yes	Yes	No
Configure RAID	No	Yes	Yes
Update host bus adapter (HBA) and expander firmware	No	Yes	Yes
Power on or off the server remotely	Yes	No	No

Server Management Software Benefits

The benefits of the server management solutions are described in the following sections:

■ "Oracle Integrated Lights Out Manager" on page 11
■ "Oracle Hardware Management Pack" on page 12
■ "Oracle Hardware Installation Assistant" on page 13

Oracle Integrated Lights Out Manager

Oracle Integrated Lights Out Manager (ILOM) is system management firmware that is preinstalled on Oracle's x86-based servers and SPARC-based servers. The Oracle ILOM firmware automatically initializes as soon as power is applied to your server. Oracle ILOM enables you to actively manage and monitor components installed in your server. Using Oracle ILOM, you can remotely manage your servers regardless of the state of the host system. You can also configure Oracle ILOM to integrate with other management tools in your data center.

Oracle ILOM enables you to actively manage and monitor the server independently of the operating system state, providing you with a reliable Lights Out Management (LOM) system. With Oracle ILOM, you can:

- Learn about hardware errors and faults as they occur
- Remotely control the power state of your server
- Monitor power server consumption metrics
- View the graphical and non-graphical consoles for the host
- View the current status of sensors and indicators on the system
- Determine the hardware configuration of your system
- Receive generated alerts about system events in advance through IPMI PETs, SNMP traps, or email alerts.
- Access diagnostics supported through for your system
- Access RAID controller information (requires installation of the Hardware Management Pack, which is a free download to customers with support)

The service processor (SP) runs its own embedded operating system and has a dedicated Ethernet port, which together provide out-of-band management capability. In addition, you can access some Oracle ILOM features from the server's host operating system (Solaris, Linux, or Windows). Using Oracle ILOM, you can remotely manage your server as if you were using a locally attached keyboard, monitor, and mouse.

Oracle ILOM automatically initializes as soon as power is applied to your server. It provides a full-featured, browser-based web interface and has an equivalent command-line interface (CLI). There is also an industry-standard SNMP interface and IPMI interface.

You can easily integrate these management interfaces with other management tools and processes that you might have already working with your servers, such as Oracle Enterprise Manager Ops Center.

For more information about Oracle Enterprise Manager Ops Center, go to:
http://www.oracle.com/us/products/enterprise-manager/opscenter/index.html

In addition, you can integrate Oracle ILOM with a number of third-party tools, such as IBM Director, HP OpenView Operations, and Microsoft System Center Configuration Manager 2007. See the Oracle ILOM 3.0 documentation for further details.

Note – To use the Storage Monitoring feature in Oracle ILOM, you must install the Oracle Hardware Management Pack.

Oracle Hardware Management Pack

Oracle Hardware Management Pack is available for many x86–based servers and some SPARC-based servers. It includes the categories of tools described in the following sections:

Oracle Hardware Management Agents

The Oracle Hardware Management Agent and associated Oracle Hardware SNMP Plugins and Oracle Hardware Storage SNMP Plugins (SNMP Plugins) provide a way to monitor your server hardware. With the Hardware Management Agent SNMP Plugins you can use SNMP to monitor the Oracle servers and server modules in your data center, without having to connect the management port of the service processor to the network. This in-band functionality enables you to use a single IP address (the host's IP) for monitoring you servers and server modules.

The Hardware Management Agent SNMP Plugins run on the host operating system of Oracle servers. The Oracle Hardware SNMP Plugin uses the keyboard controller-style (KCS) interface to communicate with the service processor, and the Oracle Hardware Storage SNMP Plugins use the Oracle Hardware Storage Access Libraries to communicate with the service processor. By regularly polling the service processor, information about the current state of the server is fetched automatically by the Hardware Management Agent. This information is then made available through SNMP, using the SNMP Plugins.

Note – Previous versions of Hardware Management Pack have included a separate Storage Management Agent, but starting with Oracle Hardware Management Pack 2.1, the Storage Management Agent has been merged with the functionality of the Hardware Management Agent. System storage information is now available through SNMP with the sunStorageMIB.

Oracle Server CLI Tools

Oracle Server CLI Tools (CLI Tools) are command-line interface tools that configure Oracle servers. CLI Tools is a Hardware Management Pack component that you install using Oracle

Hardware Management Pack Installer . The CLI tools are available on the following operating systems: Oracle Solaris, Linux, Windows, and Oracle VM.

Task	Tool
Configure BIOS CMOS settings, device boot order, and some SP settings.	biosconfig CLI
Query, update, and validate firmware versions on supported SAS storage devices, embedded SAS storage controllers, LSI SAS storage expanders, and disk drives.	fwupdate CLI
Restore, set, and view Oracle ILOM configuration settings, as well as viewing and setting Oracle ILOM properties that are associated with network management, clock configuration, and user management.	ilomconfig CLI
View or create RAID volumes on storage drives that are attached to RAID controllers, including storage arrays.	raidconfig CLI

IPMItool

A version of IPMItool is provided as part of the Hardware Management Pack. It can be installed if your system does not already have IPMItool installed. IPMItool is a command-line application that enables you to manage and configure devices that support the IPMI protocol.

Oracle Hardware Installation Assistant

The Oracle Hardware Installation Assistant application is a provisioning tool for Sun Fire and Sun Blade x86 servers. The application guides you through server setup and maintenance by providing a single interface that facilitates server installation, configuration, maintenance, and recovery tasks.

Oracle Hardware Installation Assistant includes the following features and benefits:

- Supports multiple boot media options. Launch the Oracle Hardware Installation Assistant application from either a local drive attached to the server (CD/DVD or USB flash drive), a remote redirected network drive (virtual CD/DVD drive or ISO image), or an image available on your PXE network environment.

- Guides you through OS installation and provides device drivers for optional accessory cards and other system hardware.

- Guides you in RAID configuration for servers that contain an integrated LSI disk controller. Support is for RAID 0 and RAID 1 integrated mirror or integrated mirror enhanced (striping). Assisted RAID 1 configuration is also available (beginning with Oracle Hardware Installation Assistant 2.4) for LSI SAS-2 controllers (926x, 9280).
- Provides a specific set of service processor and Oracle ILOM configuration capabilities.
  - Enables management of Oracle ILOM user account settings and configuration of network settings, system clock, and system identification information.
  - Allows BIOS-level boot device priority configuration and next boot device selection.
- Updates firmware for:
  - System BIOS and Oracle ILOM firmware
  - Host Bus Adapter (HBA) firmware
  - Expander firmware

Evaluating Your Server Environment

Now you decide which option or combination of options best suits your needs.

The evaluation covers the following categories:

Which Operating System Do You Plan to Install?

Most of the server management software works with most operating systems that are supported for Oracle servers. However, there are some exceptions that are important to note. See the following table for detailed information.

Server Management Software	Operating System Limitations
Oracle Integrated Lights Out Manager (ILOM)	There are no operating system limitations with Oracle ILOM, because the software runs on the system service processor, not on the operating system.
Oracle Hardware Management Pack	There are some limitations on which operating systems are supported with the Hardware Management Pack components. Refer to the support matrix at http://www.oracle.com/goto/system-management for details.

Server Management Software	Operating System Limitations
Oracle Hardware Installation Assistant	You can install only Windows and Linux (Oracle Linux, Red Hat Enterprise Linux, and SUSE Linux) operating systems with Oracle Hardware Installation Assistant.
	If you have Oracle Solaris, Oracle VM, or VMware ESX installed on the server, you can update firmware and perform additional server management tasks.

From Which Platform Do You Want to Run the Software?

One factor to keep in mind when deciding on your server management strategy is whether you want to run your server management tasks from the system host, embedded firmware, or bootable media.

Server Management Software	Platform
Oracle Integrated Lights Out Manager (ILOM)	Embedded service processor firmware
Oracle Hardware Management Pack	Host operating system
Oracle Hardware Installation Assistant	Bootable media (CD/DVD or USB drive) from a local or remote source

Do You Want to Update or Monitor Your System Components?

If you want to primarily update or monitor system software and components, you will want to make sure that the software that you choose covers those requirements. The following table lists the main functions of each software option.

Server Management Software	Update Functions	Monitoring Functions
Oracle Integrated Lights Out Manager (ILOM)	Updates Oracle ILOM and BIOS firmware	Monitors component status and reports faults
Oracle Hardware Management Pack	Configures Oracle ILOM and BIOS firmware	Monitors component status and reports faults
	Updates HBA and expander firmware	
	Configures RAID	

Server Management Software	Update Functions	Monitoring Functions
Oracle Hardware Installation Assistant	Updates and configures Oracle ILOM, BIOS, and HBA firmware	Provides minimal system status information
	Assists in operating system and driver installation	
	Configures RAID	

Do You Have a Modular System (Blade) Environment?

All of the server management software can be used with a modular systems (blades) or rack servers, but only one of the software solutions, Oracle ILOM, can be used to manage blade servers from both the modular system chassis and blade server interfaces.

Server Management Software	Modular System CMM Interface?	Server Module Interface?
Oracle Integrated Lights Out Manager (ILOM)	Yes	Yes
Oracle Hardware Management Pack	No	Yes
Oracle Hardware Installation Assistant	No	Yes

Server Management Downloads and Documentation

For instructions on accessing management software and documentation, see the following:

Server Management Option	How to access the software	Documentation Library URL
Oracle Integrated Lights Out Manager	No installation required. Embedded on system service processor.	Oracle ILOM documentation library
Oracle Hardware Management Pack	Download from http://support.oracle.com.	Oracle Hardware Management Pack documentation library
Oracle Hardware Installation Assistant	Order media with the system or download an .iso image from http://support.oracle.com.	Oracle Hardware Installation Assistant documentation library

Oracle ILOM Documentation

Description	Link
Learn where to get information about Oracle ILOM features	"Oracle ILOM 3.0 Common Feature Set Documentation" on page 17

Oracle ILOM 3.0 Common Feature Set Documentation

This table identifies the guides in the Oracle Integrated Lights Out Manager (ILOM) 3.0 online documentation library (formerly called Sun Integrated Lights Out Manager 3.0 Documentation Collection). Refer to these guides for information about using Oracle ILOM features that are common to all server platforms.

Refer to the Oracle ILOM documentation library.

Document	Content
Oracle Integrated Lights Out Manager (ILOM) 3.0 Feature Updates and Release Notes	For each point release after Oracle ILOM 3.0, provides information about: ■ New Oracle ILOM 3.0.x features ■ Known issues and workarounds ■ Fixed issues
Oracle Integrated Lights Out Manager (ILOM) 3.0 HTML Documentation Collection	Comprises all guides in the Oracle ILOM 3.0 Documentation Library.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Quick Start	Helps you get the Oracle ILOM firmware up and running.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Remote Redirection Consoles Guide	Describes the setup and use of the Oracle ILOM 3.0 Remote Console feature for accessing a host console remotely.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management Concepts Guide	Describes the Oracle ILOM 3.0 daily management features.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management CLI Procedures Guide	Describes the Oracle ILOM daily management features available through the CLI.

Document	Content
Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management Web Procedures Guide	Describes the Oracle ILOM daily management features available through the web interface.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Maintenance and Diagnostics CLI and Web Procedures Guide	Describes maintenance and diagnostics features that are available in both the Oracle Integrated Lights Out Manager (ILOM) 3.0 web interface and CLI.
Oracle Integrated Lights Out Manager (ILOM) 3.0 Protocol Management CLI and Web Procedures Guide	Provides Oracle Integrated Lights Out Manager (ILOM) 3.0 instructions for managing remote Oracle hardware devices with the following supported management protocols: ■ Simple Network Management Protocol (SNMP) ■ Intelligent Platform Management Interface (IPMI) ■ Web Service Management (WS-Man) ■ Common Information Model (CIM)
CMM Administration CLI and Web Procedures Guide	Provides Oracle ILOM 3.0 instructions for managing the chassis components in a Sun Blade 6000 or a Sun Blade 6048 Modular System Chassis.

Updating Firmware

Updates to the firmware for Oracle ILOM, system BIOS, and LSI HBA are periodically available on the My Oracle Support to provide additional features and bug fixes for the server. The firmware components must all be updated together for a given software update. The "Firmware Versions Worksheet" on page 20 can be used to keep track of the firmware versions needed for the upgrade process.

This section contains the following topics:

- "Firmware Versions Worksheet" on page 20
- "Determining Current Firmware Versions" on page 21
- "Planning and Downloading the Firmware Update" on page 24
- "Updating the Oracle ILOM and System BIOS" on page 27
- "How to Update Embedded HBA Firmware" on page 32
- "How to Update NEM Firmware Using the Web Interface" on page 32
- "How to Update NEM Firmware Using the CLI" on page 35

You need to make sure that component firmware is compatible when you change:

- NEMs

- REMs

- PCIe Express modules

- LSI host bus adapter (HBA)

- CMODs if the CPLD in the new CMOD does not match the CPLD of the existing CMODs.

You can change firmware by using the following tools:

Firmware	Tool
Oracle ILOM and BIOS	Oracle ILOM web interface or CLI
NEM	Oracle ILOM web interface or CLI
REM	Oracle Hardware Installation Assistant
PCIeExpress modules	Oracle Hardware Installation Assistant
LSI HBA	Oracle Hardware Installation Assistant

See the following table for the firmware update procedures.

Step	Description	Link
1	Verify the firmware versions that are currently running on the server.	"Determining Current Firmware Versions" on page 21
2	Determine the target firmware versions and download the firmware.	"Planning and Downloading the Firmware Update" on page 24
3	Update the Oracle ILOM and system BIOS.	"Updating the Oracle ILOM and System BIOS" on page 27
4	Update the Embedded HBA firmware.	"How to Update Embedded HBA Firmware" on page 32
5	Update the NEM firmware.	"How to Update NEM Firmware Using the Web Interface" on page 32 or "How to Update NEM Firmware Using the CLI" on page 35

Firmware Versions Worksheet

The following table is provided to help keep track of firmware versions that you will identify in the procedures in this section.

Firmware Type	Current Version	Intermediate Version	Target Version
Oracle ILOM			
BIOS			
LSI HBA		n/a	
CPLD			
NEM			
REM			

Determining Current Firmware Versions

The first two procedures in this section describe alternate ways to determine the current Oracle ILOM and BIOS firmware versions. The third procedure describes how to determine the LSI HBA firmware version.

This section contains the following procedures:

- "How to Verify the Oracle ILOM and BIOS Firmware Versions Using the Web Interface" on page 21
- "How to Verify the Oracle ILOM and BIOS Firmware Versions Using the Command Line Interface" on page 23
- "How to Verify the LSI HBA Firmware Version" on page 24

▼ How to Verify the Oracle ILOM and BIOS Firmware Versions Using the Web Interface

1 **Open a web browser and enter the IP address of the server's service processor.**

2 **At the login page, log in using a user account with Administrator privileges.**

If you are logging into Oracle ILOM for the first time, see "Connecting to Oracle ILOM" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide* for more information.

The first web page presented is the System Information —> Overview page, which includes the Oracle ILOM version and Build Number.
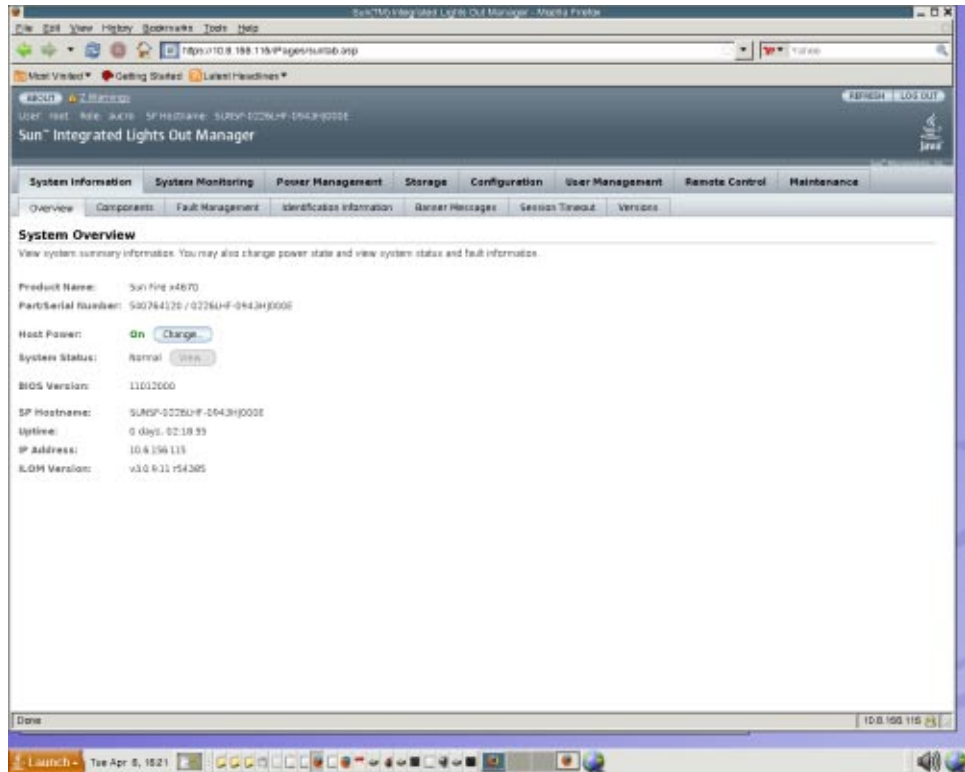
3 Click on System Information —> Components.

4 Click on /SYS/BIOS in the Component Name field.

The view component name and information dialog box is displayed.

The FRU version field shows the BIOS version number.
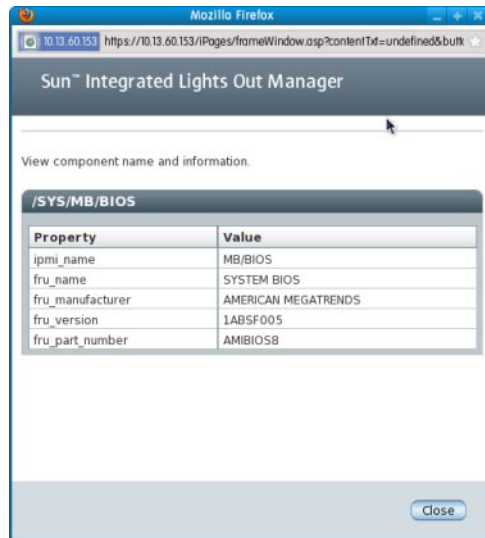
5   **Note the Oracle ILOM and BIOS versions on the ["Firmware Versions Worksheet" on page 20](#).**

▼ How to Verify the Oracle ILOM and BIOS Firmware Versions Using the Command Line Interface

1   **Using a client system, access a command line and establish a Secure Shell (SSH) connection using a user account with Administrator privileges and the server's service processor IP address. For example:**

    ssh *user_name*@*sp_ip_address*

    If you are logging into Oracle ILOM for the first time, see "Connecting to Oracle ILOM" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide* for more information.

2   **To view the Oracle ILOM version information, type:**

    ```
    version
    ```

    This command returns output similar to the following:

    ```
    SP firmware 2.0.2.16
    SP firmware build number: 42063
    SP firmware date: Mon Feb  9 22:45:34 PST 2009
    SP filesystem version: 0.1.16
    ```

3   **To view the BIOS version, type:**

    show /SYS/BIOS

The command returns output similar to the following:

```
 /SYS/BIOS
    Targets:

    Properties:
    type = BIOS
    ipmi_name = BIOS
    fru_name = SYSTEM BIOS
    fru_manufacturer = AMERICAN MEGATRENDS
    fru_version = 11016600
... fru_part_number = AMIBIOS8

    Commands:
    cd
    show
```

The fru_version field contains the BIOS version number.

4   Note the Oracle ILOM and BIOS versions on the "Firmware Versions Worksheet" on page 20.

▼ How to Verify the LSI HBA Firmware Version

1   Reboot the server.

2   Note the LSI firmware version that is displayed during system boot.

3   Record the current LSI firmware version in the "Firmware Versions Worksheet" on page 20.

Planning and Downloading the Firmware Update

This section contains the following topics:

- "How to Plan the Firmware Update" on page 24
- "How to Download Firmware Updates" on page 25
- "How to Request Physical Media Online" on page 25
- "How to Request Physical Media by Phone" on page 27

▼ How to Plan the Firmware Update

Use the "Firmware Versions Worksheet" on page 20 to record intermediate and target firmware version identified in this procedure.

1   View the Product Notes for information on all firmware versions available for the server, and select the software download version that contains the versions of the firmware that you want to download.

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> **Note –** For some Oracle ILOM and BIOS updates, you need to update to an intermediate firmware version before you update to the final target Oracle ILOM version. Any needed intermediate firmware versions are specified in the Product Notes.

2 **Record the intermediate and target firmware versions in the "Firmware Versions Worksheet" on page 20.**

▼ How to Download Firmware Updates

1 **Go to `http://support.oracle.com`.**

2 **Sign in to My Oracle Support.**

3 **At the top of the page, click the Patches and Updates tab.**

4 **In the Patch Search box, click Product or Family (Advanced Search).**

5 **In the Product field, type a full or partial product name, for example, Sun Server X2-8 until a list of matches is displayed and select the product of interest.**

6 **In the Release pull-down list, click the Down arrow.**

7 **In the window that appears, click the triangle (>) by the product folder icon to show the choices and then select the release of interest and click Close.**

8 **In the Patches Search box, click Search.**

A list of product downloads (listed as patches) appears.

9 **Select the Patch name of interest, for example, 12684585, for the Sun Server X2-8 1.0 Firmware.**

10 **In the right-side pane that appears, click Download.**

▼ How to Request Physical Media Online

1 **Go to `http://support.oracle.com`.**

2 **Select the Flash interface and sign in.**

3 **Click on the Contact Us link in the upper right corner of the page.**

4   In the Request Description section:

a.   In the Request Category drop-down list, select:

Software & OS Media Requests

b.   In the Request Summary field, type: .

`PMR for latest software release for Sun Server X2-8`

5   In the Request Details section, answer the questions shown in the following table:

Question	Your Answer
Is this a physical software media shipment request?	Yes
Which product line does the media request involve?	Sun Products
Are you requesting a required password for a patch download?	No
Are you requesting a patch on CD/DVD?	Yes
If requesting a patch on CD/DVD, please provide the patch number and OS/platform?	Enter the patch number for each download that you want from the software release.
List the product name and version requested for the physical media shipment?	*Product Name*: Sun Server X2–8. *Version*: Latest software release number.
What is the OS/platform for the requested media?	If you are requesting OS-specific downloads, specify the OS here. If you are requesting system firmware only, enter Generic.
Are any languages required for this shipment?	No

6   Fill in the Ship-To contact, phone number, email address, company name, and shipping address information.

7   Click Next.

The Relevant Files view appears.

8   (Optional) Under Relevant Files, you can browse for files or type in any relevant knowledge-based article, for example `Knowledge Article 1357561.1`.

9   Click Next

The Related Knowledge view appears. It might display information related to your request.

10   Click Submit Request.

> **Note** – If the Submit Request button is not selectable (grayed-out), check if any required fields are missing. If the number corresponding to a panel on the left-hand side of the screen is red, that panel is missing some required information. When all three numbers are green, the Submit Request button should be selectable.

▼ How to Request Physical Media by Phone

1 **Call Oracle support, using the appropriate number from the Oracle Global Customer Support Contacts Directory:**

http://www.oracle.com/us/support/contact-068555.html

2 **Tell Oracle support that you want to make a physical media request (PMR) for the Sun Server X2–8.**

   - **If you are able to access the specific software release and patch number information from My Oracle Support, provide this information to the support representative.**

   - **If you are not able to access the software release information, request the latest software release for the Sun Server X2–8.**

Updating the Oracle ILOM and System BIOS

This section has two alternate procedures for updating the Oracle ILOM and system BIOS.

▼ How to Update the Oracle ILOM and System BIOS Using the Web Interface

Before You Begin
   - Identify the version of Oracle ILOM that is currently running on your system. See "Determining Current Firmware Versions" on page 21.

   - Download the firmware image for your server or CMM from the Sun platform's product web site. See "How to Download Firmware Updates" on page 25.

   - Copy the firmware image to the system on which the web browser is running, using a supported protocol (TFTP, FTP, HTTP, HTTPS).

   - Obtain an Oracle ILOM user name and password that has Admin (a) role account privileges. You must have Admin (a) privileges to update the firmware on the system.

> **Note –** The firmware update process might take about 15 minutes to complete, depending on whether the system is a 4 or 8 socket system. During this time, do not perform other Oracle ILOM tasks. When the firmware update is complete, the system reboots.

1   Log in to the Oracle ILOM web interface.

See "How to Connect to the Oracle ILOM Web Interface" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide*.

2   Select Maintenance –> Firmware Upgrade.

The Firmware Upgrade page appears.
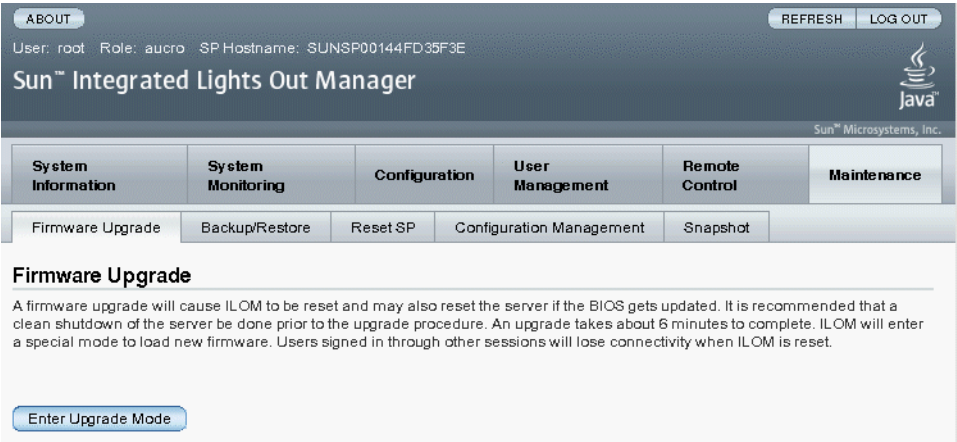
3   In the Firmware Upgrade page, click Enter Upgrade Mode.

An Upgrade Verification dialog appears, indicating that other users who are logged in will lose their session when the update process is completed.

4 In the Upgrade verification dialog box, click OK to continue.

You are prompted to select an image file to upload.

5 Perform the following actions:

a. Specify the image location by performing one of the following:

- **Click Browse to select the location of the firmware image you want to install.**

- **If supported on your system, click Specify URL. Then type into the text box the URL for the firmware image.**

b. Click the Upload button to upload and validate the file.

Wait for the file to upload and validate.

The Firmware Verification page appears.

6 In the Firmware Verification page, enable any of the following options:

- **Preserve Configuration. Enable this option if you want to save your existing configuration in Oracle ILOM and restore that existing configuration after the update process is completed.**

- **Delay BIOS upgrade until next server power off. Enable this option if you want to postpone the BIOS upgrade until the next time the system reboots.**

7 Click Start Upgrade to start the upgrade process or click Exit to cancel the process.

When you click Start Upgrade the upload process starts and a prompt to continue the process appears.

Note – If you did not preserve the Oracle ILOM configuration before the firmware update, you need to perform the initial Oracle ILOM setup procedures to reconnect to Oracle ILOM. See "Communicating With Oracle ILOM and the System Console" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide*.

8 **At the prompt, click OK to continue.**

The Update Status page appears, providing details about the update progress. When the update indicates 100%, the firmware upload is complete. When the upload is completed, the system automatically reboots.

Note – The Oracle ILOM web interface might not refresh properly after the update is completed. If the Oracle ILOM web interface is missing information or displays an error message, you might be viewing a cached version of the page from the version previous to the update. Clear your browser cache and refresh your browser before continuing.

9 **Log in to the SP Oracle ILOM web interface.**

10 **Select System Information –> Version to verify that the firmware version on the SP or CMM corresponds to the firmware image you installed.**

▼ How to Update the Oracle ILOM and System BIOS Using the CLI

Before You Begin
- Identify the version of Oracle ILOM that is currently running on your system. See "Determining Current Firmware Versions" on page 21.
- Download the firmware image for your server from the Sun platform product web site. See "How to Download Firmware Updates" on page 25.

- Copy the firmware image to a local server using a supported protocol (TFTP, FTP, HTTP, HTTPS).

- Obtain an Oracle ILOM user name and password that has Admin (a) role account privileges. You must have Admin (a) privileges to update the firmware on the system.

- To verify that you have network connectivity to update the firmware, type -> **show /SP/network**.

Note – The firmware update process takes about fifteen to twenty minutes to complete, depending on whether it is a 4 or 8 socket system. During this time, do not perform other Oracle ILOM tasks. When the firmware update is complete, the system reboots automatically.

---

1 Log in to the Oracle ILOM CLI.

See "Connecting to Oracle ILOM" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide* for more information.

2 Type the following command to load the Oracle ILOM firmware image:

->**load –source** *supported_protocol*://*server_ip*/*path_to_firmware_image*/*filename*.**ima**

Use TFTP, FTP, HTTP, or HTTPS.

A note about the firmware update process appears, followed by message prompts to load the image. The text of the note depends on your server platform.

3 At the prompt for loading the specified file, type y for yes or n for no.

The prompt to preserve the configuration appears.

4 At the preserve configuration prompt, type y for yes or n for no.

- Type y to save your existing Oracle ILOM configuration and to restore that configuration when the update process is completed.

- Typing n at this prompt advances you to another platform-specific prompt.

A prompt to postpone the BIOS update appears.

5 When asked if you want to force the server off to upgrade the BIOS, type y for yes or n for no.

Note – If you answer no (n) to the prompt, the system postpones the BIOS update until the next time the system reboots. If you answer yes (y) to the prompt, the system automatically updates the BIOS, if necessary, when updating the firmware.

The system loads the specified firmware file and then automatically reboots to complete the firmware update.

6 **Reconnect to the Oracle ILOM server SP, using an SSH connection and using the same user name and password that you provided in Step 1 of this procedure.**

If you did not preserve the Oracle ILOM configuration before the firmware update, you must perform the initial Oracle ILOM setup procedures to reconnect to Oracle ILOM. See "Communicating With Oracle ILOM and the System Console" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide* for additional information.

7 **To ensure that the proper firmware version was installed, at the CLI prompt, type:**

```
-> version
```

▼ How to Update Embedded HBA Firmware

To update the embedded HBA firmware, you can use Oracle Hardware Installation Assistant or LSI tools.

● **To update the embedded HBA firmware, use one of the following:**

- **If you want to use Oracle Hardware Installation Assistant, see "How to Update HBA Firmware" in** *Oracle Hardware Installation Assistant 2.5 User's Guide for x86 Servers*.

- **If you have the SAS6-REM-Z, SAS and you want to use LSI tools, see the SGX-SAS6-REM-Z: SAS Integrated RAID Solutions User's Guide (`http://www.lsi.com/sep/Pages/oracle/sg_x_sas6-rem-z.aspx`).**

- **If you have the SGX-SAS6-R-REM-Z and you want to use LSI tools, see the SGX-SAS6-R-REM-Z: Software User's Guide (`http://www.lsi.com/sep/Pages/oracle/sg_x_sas6-r-rem-z.aspx`).**

▼ How to Update NEM Firmware Using the Web Interface

The network express modules (NEMs) provide server network connectivity options.

Before You Begin Perform the following actions before upgrading your NEM firmware:

- Download the firmware image for your server from `http://my.oracle.support`
- Copy the firmware image to the system on which the web browser is running, using a supported protocol (TFTP, FTP, HTTP, HTTPS).
- Obtain an Oracle ILOM user name and password that has Administrator role account privileges. You must have Administrator privileges to update the firmware on the system.

1 **Restart the server and enter the BIOS screen.**

When POST messages appear, press F2 to enter the BIOS setup utility.

> **Note** – You do not need to configure anything in the BIOS setup utility. This action ensures that the NEMs are powered-on but the OS does not boot.

2   Log in to the Oracle ILOM web interface.

For more details, see "How to Connect to the Oracle ILOM Web Interface" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide*.

3   Select System Information –> Components.

The Component Management page appears.

4   Highlight NEM0.

5   From the Actions drop-down menu, select Update Firmware.

A screen asks for download details.
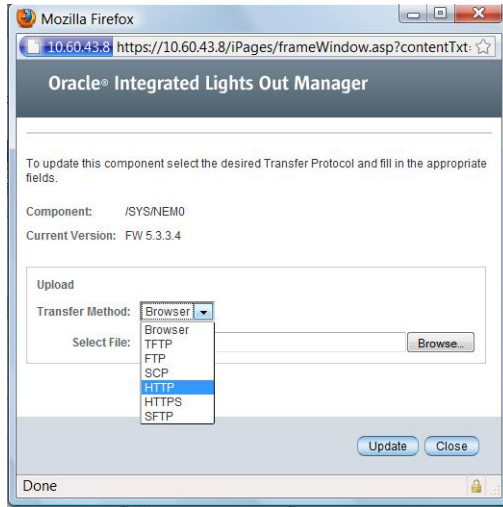
6 **Perform the following actions:**

   a. **Specify the image location by performing one of the following:**

      ■ **Click Browse to select the location of the firmware image you want to install.**

      ■ **If supported on your system, click Specify URL. Then type the URL for the firmware image into the text box.**

   b. **Select a transfer method from the drop-down list.**

   c. **Click the Update button to upload the file and update the firmware.**

      The Update Status display appears, providing details about the update progress. When the update indicates 100%, the firmware upload is complete.

      When the update is finished, it displays the message `Firmware Update Successful. Auto-closing windows in 2 seconds`, then it closes the display.

7 **Repeat steps 1 through 6 for NEM1.**

8 **Press ESC in the BIOS setup utility to boot the system.**

▼ How to Update NEM Firmware Using the CLI

Before You Begin   Perform the following actions before upgrading your NEM firmware:

- Download the firmware image for your server. For details, see http://my.oracle.support.
- Copy the firmware image to the system on which the web browser is running, using a supported protocol (TFTP, FTP, HTTP, HTTPS).
- Obtain an Oracle ILOM user name and password that has Administrator role account privileges. You must have Administrator privileges to update the firmware on the system.

1   Restart the server and enter the BIOS screen.

When POST messages appear, press F2 to enter the BIOS setup utility.

Note – You do not need to configure anything in the BIOS setup utility. It is used in this procedure to ensure that the NEMs are powered-on but the OS does not boot.

---

2   Log in to the Oracle ILOM CMM CLI.

3   Use the cd command to navigate to NEM0.

4   Type the show command to see the NEM properties, including the firmware version.

The fru_extra_1 property field identifies the firmware version presently installed on the NEM.

```
-> cd /SYS/NEM0
/SYS/NEM0

-> show

 /SYS/NEM0
    Targets:
        PRSNT
        STATE
        ERR
        OK
        SERVICE
        OK2RM
        LOCATE

    Properties:
        type = Network Express Module
        ipmi_name = NEM0
        fru_manufacturer = VENDOR_Name
        fru_part_number = 511-1056-04
        fru_extra_1 = FW 5.3.1.0
        fault_state = OK
        load_uri = (none)
        clear_fault_action = (none)
        power_state = On

    Commands:
```

```
cd
load
reset
set
show
start
stop
```

5   **Use the `load_uri` command to upload and install the firmware update package.**

The following table shows the required parameters.

Transfer Method	Examples
TFTP	load_uri=tftp://*ip_address*/rom_nem.pkg
FTP	load_uri=ftp://*username:password@ip_address*/rom_nem.pkg
SCP	load_uri=scp://*username:password@ip_address*/rom_nem.pkg
HTTP	load_uri=http://*username:password@ip_address*/rom_nem.pkg
HTTPS	load_uri=https://*username:password@ip_address*/rom_nem.pkg
SFTP	load_uri=sftp://*username:password@ip_address*/rom_nem.pkg

Where:

- *ip_address* is the IP address of the system where the file is stored.
- *username* is the login user name to the system where the file is stored.
- *password* is the login password to the system where the file is stored.
- *rom_nem*.pkg is the name of the firmware update package.

6   **Wait a few moments for Oracle ILOM to confirm the completion of the firmware update process.**

A success or failure status appears.

7   **Use the `show` command to view and confirm the firmware version that is installed on the NEM.**

8   **Repeat steps 1 through 7 for NEM1 .**

9   **Press ESC in the BIOS setup utility to restart the boot process.**

Server-Specific Oracle ILOM Features

Description	Link
Get minimum supported firmware and BIOS	"Minimum Supported Firmware and BIOS" on page 37
Monitor your power usage	"Power Management" on page 37
Fix problems with the Oracle ILOM preboot menu	"Fixing Problems with Oracle ILOM Using the Preboot Menu" on page 42

Minimum Supported Firmware and BIOS

This table identifies the minimum Oracle ILOM and BIOS firmware versions supported on the Sun Server X2-8. For information about software updates, refer to the *Sun Server X2-8 (formerly Sun Fire X4800 M2) Product Notes*.

TABLE 1 Firmware and BIOS Versions

Oracle ILOM SP Version	Host BIOS Version
3.0.14.25	21

See Also

- "Power Management" on page 37
- "Fixing Problems with Oracle ILOM Using the Preboot Menu" on page 42

Power Management

Oracle ILOM enables you to monitor power usage, including setting notification thresholds so you can proactively manage power usage.

Note – An SNMP MIB (SUN-HW-CTRL-MIB) is available on the Tools and Drivers CD/DVD ISO image for your server to support power management.

Description	Link
Power management terminology	"Power Management Terminology" on page 38
Using the web interface to monitor power usage and set notification thresholds	"How to Use the Web Interface to Monitor Power Usage and Set Notification Thresholds" on page 38
Using the CLI to monitor power usage and set notification thresholds	"How to Use the CLI to Monitor Power Usage and Set Notification Thresholds" on page 40

Power Management Terminology

The following table describes power management terminology.

Term	Definition
Actual power	The input power measured in watts. This is the actual power consumed by all the power supplies in the system.
Permitted power	The maximum power that the server can at any time.
Allocated power	The input power in watts allocated to installed and hot pluggable components.
Available power	The input power capacity in watts. Amount of power available to the server from the chassis.
Threshold notification	A configurable value to post an event message when power consumption exceeds a threshold value in watts. Two threshold values can be set (for example, one as a minor warning and one as critical).

See Also

- "How to Use the Web Interface to Monitor Power Usage and Set Notification Thresholds" on page 38
- "How to Use the CLI to Monitor Power Usage and Set Notification Thresholds" on page 40

▼ How to Use the Web Interface to Monitor Power Usage and Set Notification Thresholds

This task describes how to monitor power usage and set up to two thresholds so you can be notified when the server exceeds a power limit.

1   **Connect to the Oracle ILOM web interface by typing the IP address of the server into your browser's address field. For example:**

`https://x.x.x.x`

The Oracle ILOM login screen appears.

2   **Log in by entering a user name and password.**

If you login using the `root` account, the default password is `changeme`. If you choose to use another user account, make sure it has Admin privileges.

The Oracle ILOM web interface appears.

3   **Click the Power Management tab.**

The Power Consumption page appears.

4   **To set a notification threshold, do the following. You can set two thresholds.**

a.   **Click Enabled by the Notification Threshold x.**

b.   **Type the threshold in watts.**

c.   **Click Save.**

5   **For power allocation information, click the Allocation tab.**

6   **For statistics on power usage, click the Statistics tab.**

7 For history on power usage, click the History tab.

See Also
- "Power Management Terminology" on page 38
- "How to Use the CLI to Monitor Power Usage and Set Notification Thresholds" on page 40

▼ How to Use the CLI to Monitor Power Usage and Set Notification Thresholds

This task describes how to monitor power usage and set up to two thresholds so you can be notified when the server exceeds a power limit.

1 Log in to the server SP by opening an SSH connection at a terminal window:

$ **ssh root@***SPIPaddress*

Password: *password*

where:

- *SPIPaddress* is the IP address of the server's service processor.
- *password* is the password for the account. The default password for the root account is changeme. If you choose to use another user account, make sure it has Admin privileges.

The Oracle ILOM CLI prompt appears (->).

2 Enter the following command:

-> **show /SP/powermgmt**

Example output might look like:

```
-> show /SP/powermgmt

 /SP/powermgmt
    Targets:
        powerconf

    Properties:
        actual_power = 604
        permitted_power = 4576
        allocated_power = 1658
        available_power = 4576
        threshold1 = 0
        threshold2 = 0

    Commands:
        cd
        set
        show
```

where:

- `actual_power` displays the current system input power (in watts) consumption.
- `permitted_power` displays the maximum power consumption (in watts) expected for the system.
- `allocated_power` displays the power allocated in watts to the system components.
- `available_power` displays the input power capacity (in watts) that is available to system components.

3   Alternately, you can view total power consumed by the system by entering the command:

```
-> show /SYS/VPS
```

Example output might look like:

```
-> show /SYS/VPS

 /SYS/VPS
    Targets:
        history

    Properties:
        type = Power Unit
        ipmi_name = VPS
        class = Threshold Sensor
        value = 601,500 Watts
        upper_nonrecov_threshold = N/A
        upper_critical_threshold = N/A
        upper_noncritical_threshold = N/A
        lower_noncritical_threshold = N/A
        lower_critical_threshold = N/A
        lower_nonrecov_threshold = N/A
        alarm_status = cleared

    Commands:
        cd
        show
```

The value of /SYS/VPS is equivalent to the value of /SYS/powermgmt actual_power.

4   To set a notification threshold, type the following. You can set two thresholds.

```
-> cd /SP/powermgmt
-> set threshold1|2 = n
```

where n represents watts, for example, 4000.

For example:

```
-> cd /SP/powermgmt
-> set threshold1 = 4000
```

See Also   ■ "Power Management Terminology" on page 38

Fixing Problems with Oracle ILOM Using the Preboot Menu

Description	Link
Accessing the preboot menu	"Accessing the Preboot Menu" on page 42
Preboot menu command summary	"Preboot Menu Command Summary" on page 44
Using the edit command and configuring the preboot menu for remote access	"Using the edit Command and Configuring the Preboot Menu for Remote Access" on page 45
Restoring Oracle ILOM access to the serial console	"Restoring Oracle ILOM Access to the Serial Console" on page 48
Recovering the SP firmware image	"How to Recover the SP Firmware Image" on page 49

The Oracle ILOM preboot menu is a utility that can be used to fix problems with Oracle ILOM that cannot be fixed while it is running. It allows you to interrupt the Oracle ILOM boot process, configure settings, then continue booting Oracle ILOM. Among other things, it allows you to reset the Oracle ILOM root password to factory defaults, restore Oracle ILOM access to the serial port, and recover the SP firmware image.

Accessing the Preboot Menu

To access the preboot menu, you must boot the SP and interrupt the boot process.

There are two ways to interrupt the Oracle ILOM boot process: manually using the Locate button, or by typing **xyzzy** during a pause in the bootstrap process.

The first method requires you to have physical access to the server.

The second method can be done remotely.

However, note the following:

■ You must use a terminal or a terminal emulator. You cannot use an SSH, or an RKVMS session.

■ Some preboot menu settings must be configured first, and until they are, you must use the Locate button.

Because the settings must be configured before you can access the preboot menu remotely, the first time you access the preboot menu, you must use the Locate button to access the preboot

menu and configure the settings. This is described in "Using the edit Command and Configuring the Preboot Menu for Remote Access" on page 45.

See Also

- "Accessing the Preboot Menu" on page 42
- "Preboot Menu Command Summary" on page 44

▼ How to Access the Preboot Menu

1 Connect a terminal or a computer running terminal emulation software to the server's serial management port using an RJ45 serial cable.

For details on how to log into Oracle ILOM using a serial connection, refer to "Connecting to Oracle ILOM" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide*.

2 Reboot Oracle ILOM using one of these methods:

- From the server Oracle ILOM, enter the command:

  ```
  -> reset /SP
  ```

- Power off the server. See the "Powering the Server On and Off" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide*.

  The Oracle ILOM reboots, and messages begin scrolling on the screen.

3 Interrupt the Oracle ILOM boot process using one of these methods:

- After powering on or resetting the SP, press and hold the Locate button on the server front panel until the preboot menu appears.

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

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

Note – You cannot interrupt the Oracle ILOM boot process by typing **xyzzy** until you have configured the settings as described in "Using the edit Command and Configuring the Preboot Menu for Remote Access" on page 45. One of these settings sets the value of n, which is the amount of time in seconds that the system waits for your input.

The Oracle ILOM preboot menu appears as shown here.

```
Booting linux in 10 seconds...

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

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

Preboot>
```

4 Use the preboot menu commands to configure settings, reset the password, and so on.

5 When you are done, enter the boot command to exit the preboot menu and start Oracle ILOM.

See Also ■ "Preboot Menu Command Summary" on page 44
 ■ "Using the edit Command and Configuring the Preboot Menu for Remote Access" on page 45

Preboot Menu Command Summary

The preboot menu includes the following commands.

Command	Description
boot	Boots the Oracle ILOM. The preboot menu exits, and Oracle ILOM boots.
	Note – This command executes a modified boot sequence that does not offer the choice to select the diagnostic level, or to interrupt the boot sequence and return to the preboot menu. To execute the normal boot sequence, use the reset warm command instead.
vers	Displays version information including the hardware type, board rev, Oracle ILOM rev, revisions of PBSW and recovery U-Boot. Shows the checksum integrity of the images, and the preference between redundant images.
help	Displays a list of commands and parameters.
show	Displays a list of SP settings.
edit	Starts an interactive dialog that prompts and changes settings one by one. See "Using the edit Command and Configuring the Preboot Menu for Remote Access" on page 45 for details.
diag	Runs the U-boot diagnostic tests in manual mode. For more on U-boot diagnostic tests, refer to *Sun Server X2-8 (formerly Sun Fire X4800 M2) Diagnostics Guide*.

Command	Description
net	{ config | dhcp | ping | flash } ■ config - Starts a dialog that allows you to change Oracle ILOM's network settings. ■ dhcp - Changes the network addressing from static to DHCP. **Note –** You must set ipdiscovery=dhcp using the net config command first. ■ ping - Sends a ping. ■ flash - Downloads an Oracle ILOM firmware image. See "How to Recover the SP Firmware Image" on page 49. Type **help net** *command* for more details on these commands.
reset	{[warm]| cold }. Resets the SP and the host. ■ warm - Resets the SP without affecting a running host. ■ cold - Resets the SP and the host. It has the effect of powering off the server.
unconfig	{ ilom_conf | most | all } Causes Oracle ILOM to erase any configuration information and return the values to defaults the next time it boots. ■ ilom_conf - Resets configuration settings but preserves SP network and baudrate, preferred, and check_physical_presence settings. ■ most - Resets the SP data storage, but preserves network settings and baudrate, preferred, and check_physical_presence settings. ■ all - Resets all SP data storage and settings. Booting Oracle ILOM restores other defaults. **Note –** None of these options erases the dynamic FRU PROMs.

See Also

Using the edit Command and Configuring the Preboot Menu for Remote Access

This section shows how to use the edit command to change preboot menu settings. As an example, it also shows how to set the bootdelay and check_physical_presence settings so that you can interrupt the Oracle ILOM boot process using the **xyzzy** command.

Until the `bootdelay` and `check_physical_presence` settings are set to the values shown in this procedure, the only way to interrupt the Oracle ILOM boot process is to hold the Locate button down while Oracle ILOM is booting.

- `bootdelay` is optional, but setting it to a larger value gives you more time to enter the required command.
- `check_physical_presence` must be set to **no**.

Next Steps

- "How to Use the edit Command and to Configure the Preboot Menu for Remote Access" on page 46

▼ How to Use the edit Command and to Configure the Preboot Menu for Remote Access

1   Access the preboot menu.

For more information, see "Accessing the Preboot Menu" on page 42.

2   At the preboot prompt, enter the command:

Preboot> **edit**

The preboot menu enters edit mode. In edit mode, the preboot menu displays its selections one by one, offering you a chance to change each one.

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

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

4   To change the bootdelay setting, type 3, 10, or 30, and press Enter.

This specifies the number of seconds the SP boot process waits for your input.

The preboot menu redisplays the bootdelay setting with the new value.

5   Press Enter.

The next setting appears.

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

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

The preboot menu redisplays the check_physical_presence setting with the new value.

7   Press Enter.

The preboot menu asks you to confirm your changes:

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

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

If you want to exit without saving your changes, enter **n**.

The following display shows an edit session where the bootdelay and check_physical_presence settings are changed. See the table that follows for a description of edit command settings:

```
Preboot> edit

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

 Values for baudrate are {[ 9600 ]| 19200 | 38400 | 57600 | 115200 }.
  Set baudrate?              [9600]
 Values for serial_is_host are {[ 0 ]| 1 }.
  Set serial_is_host?        [0]
 Values for bootdelay are { -1 | 3 | 10 | 30 }.
  Set bootdelay?             [30] 10
  Set bootdelay?             [10]
 Values for bootretry are { -1 | 30 | 300 | 3000 }.
  Set bootretry?             [<not set>]
 Values for preferred are {[ 0 ]| 1 }.
  Set preferred?             [<not set>]
 Values for preserve_conf are {[ yes ]| no }.
  Set preserve_conf?         [yes]
 Values for preserve_users are {[ yes ]| no }.
  Set preserve_users?        [no]
 Values for preserve_password are {[ yes ]| no }.
  Set preserve_password?     [yes]
 Values for check_physical_presence are {[ yes ]| no }.
  Set check_physical_presence? [no] no
  Set check_physical_presence? [no]
 Enter 'y[es]' to commit changes: [no] y
Summary: Changed 2 settings.
Preboot>
```

Setting	Description
baudrate	Sets the baud rate of the serial port. Selections include 9600,19200, 38400, 57600, and 115200.
serial_is_host	If this is set to 0, the serial port connects to Oracle ILOM. If this is set to 1, the serial port connects to the host.
bootdelay	The number of seconds the bootstrap process waits for the user to enter **xyzzy** before booting the SP.

Setting	Description
`bootretry`	The number of seconds the preboot menu waits for user input before timing out and starting the SP. Set to -1 to disable the timeout.
`preferred`	Unused.
`preserve_conf`	Setting this to `no` duplicates the function of the `unconfig ilom_conf` command, which resets many Oracle ILOM configuration settings, but preserves SP network, `baudrate`, and `check_physical_presence` settings the next time the SP is booted.
`preserve_users`	Setting this to `no` duplicates the function of the `unconfig users` command, which resets user information to the default value next time the SP is booted.
`preserve_password`	Setting this to `no` duplicates the function of the `unconfig password` command, which resets the root password to the default next time the SP is booted.
`check_physical_presence`	If this is set to `Yes`, you must press and hold the Locate button to interrupt the SP boot process. If it is set to `No`, the boot process prompts you to interrupt it. For details, see "Using the `edit` Command and Configuring the Preboot Menu for Remote Access" on page 45.

Restoring Oracle ILOM Access to the Serial Console

This section describes how to use the preboot menu to restore access to the Oracle ILOM serial console. This is necessary if the serial console is configured to connect to the host, and a network connection to Oracle ILOM is unavailable.

The serial port can be configured to connect to the server's service processor (SP) or to the host console. The serial port is configured to the SP by default.

You can change this setting using Oracle ILOM or the preboot menu.

- If a network connection is unavailable, use the procedure in "How to Use the Preboot Menu to Restore Access to the Serial Console" on page 49 to restore Oracle ILOM access to the serial console.

▼ How to Use the Preboot Menu to Restore Access to the Serial Console

1 Access the preboot menu.

For more information, see .

2 At the preboot prompt, enter the command:

```
Preboot> edit
```

The preboot menu enters edit mode.

In edit mode, the preboot menu displays its selections one by one, offering you a chance to change each one.

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

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

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

The preboot menu redisplays the serial_is_host setting with the new value.

4 Press Enter.

The next setting appears.

5 Press Enter to scroll through the settings until the preboot menu asks you to confirm your changes.

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

6 Enter y to confirm your change.

The preboot menu displays this message:

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

▼ How to Recover the SP Firmware Image

The preboot menu provides the ability to recover the Oracle ILOM firmware image by updating (flashing) the SP firmware.

Normally, if the host is running, you can update the SP using the Oracle ILOM CLI or the web interface.

If the host is powered off and the SP firmware image becomes corrupted (making the server SP inaccessible using Oracle ILOM), you can use the following procedure to update it using the preboot menu.

Before You Begin   You must have a valid `.flash` SP firmware image file on a TFTP server. In addition, the TFTP server must be accessible over a network connection to your server's SP. This file is available on the Tools and Drivers DVD (under the `sp_firmware` directory) , and on the Oracle download site: `http://support.oracle.com`

Note – Updating the SP firmware using the preboot menu requires a `.flash` file instead of the `.pkg` file used to update the SP from Oracle ILOM.

---

1   Access the preboot menu.

For more information, refer to .

2   At the preboot prompt, enter the command:

Preboot> **net dhcp**

This configures a DHCP network. You need to be network-connected to access your tftp server.

3   Enter the command:

Preboot> **net ping** *tftpIPaddress*

where *tftpIPaddress* is the IP address of a TFTP server.

This checks to see if the TFTP server is accessible over the network.

4   Enter the command:

Preboot> **net flash** *tftpIPaddress* *path*/**ILOM-***version***-Sun_Fire_X800M2.flash**

where:

- *tftpIPaddress* is the IP address of a tftp server
- *path* is the path to the file relative to `/tftpboot`
- *version* is the version of SP firmware

For example:

Preboot> **net flash 10.8.173.25 images/ILOM-3_0_x_x_rxxxx-Sun_Server_X28.flash**

This downloads and flashes the firmware image. After a series of messages, the preboot prompt appears.

5   Restart the SP by entering the command:

Preboot> **reset**

The preboot menu exits, and the service processor reboots.

Identifying and Clearing Faults

Description	Link
Determining faults	
Clearing faults	
Components with no fault diagnosis	

When a server component fails, errors are captured either through the BIOS or the SP. Oracle ILOM gets error information from both sources and provides diagnosis in the form of a fault event. The fault event is stored in the Oracle ILOM event log as a fault message. You can use either the Oracle ILOM web interface or the command-line interface (CLI) to clear faults manually.

See Also

-

Determining Faults

When a system fault occurs, you can view system indicators and use the Oracle ILOM CLI or web interface to determine the fault. When a component is faulted, the Service Required LED for the system is illuminated, and the component or subsystem-specific Service LED is illuminated when applicable.

TABLE 2   Determining Component Faults

Method	What to do	Details
Oracle ILOM CLI	Examine fault messages in the Oracle ILOM event log or see a fault summary.	To view the Oracle ILOM event log, log in to the ILOM CLI and type: `show /SP/logs/event/list`
		To view a fault summary, log in to the Oracle ILOM CLI and type: `show /SP/faultmgmt`

TABLE 2 Determining Component Faults   *(Continued)*

Method	What to do	Details
Oracle ILOM web interface	Examine fault messages in the Oracle ILOM event log or see a fault summary.	To view the Oracle ILOM event log, log into the Oracle ILOM web interface and click: System Monitoring --> Event Logs.
		To view a fault summary, log into the Oracle ILOM web interface and click: System Information --> Fault Management.

When a server component (such as a DIMM, CPU, or CMOD) fails, the server generates a component-specific fault that is captured by Oracle ILOM. When a failed, hot-serviceable component is replaced, the faults are cleared automatically.

When a component fails that is not hot-serviceable, you need to clear the fault manually. You can use either the Oracle ILOM web interface or the command-line interface (CLI) to clear faults.

Note – You can also use the BIOS setup utility to view and delete system event logs.

You must clear the following faults manually:

- PCIe EM faults (after a PCIe EM has been replaced)
- Motherboard faults (whether or not the motherboard has been replaced)

When clearing faults, note the following:

- To clear motherboard and PCIe faults, access Oracle ILOM and clear the fault for the failed component.
- PCIe faults include /SYS/BL*n*.

For information about how to use the Oracle ILOM web interface or the CLI to clear server faults, refer to the Oracle ILOM documentation library at:
http://www.oracle.com/pls/topic/lookup?ctx=ilom30

See Also

Clearing Faults

The procedure for clearing a fault differs depending on the type of component.

TABLE 3 Component Type and Fault Clearing

Component Type	Fault Status
Customer-replaceable units (CRUs) that are hot-swappable and are monitored by the SP	Faults are cleared automatically when the failed component is replaced and the updated status is reported as deasserted.
CRUs and field-replaceable units (FRUs) that have a FRUID container with identity information	Faults are cleared automatically when the failed component is replaced.
CRUs and FRUs that are not hot-swappable or lack a FRUID container with identity information	Faults are not cleared automatically.

You can use the Oracle ILOM web interface or the command-line interface (CLI) to manually clear faults. For information about how to use the Oracle ILOM web interface or the CLI to clear server faults, see the Oracle ILOM 3.0 Documentation Collection.

The following types of faults are diagnosed by the SP.

TABLE 4 Types of Component Faults

Fault Type	Component or Component Status
Environmental events	Fan modules, power supplies, ambient temperature, and AC power loss
Memory Reference Code (MRC) errors and warnings	Memory initialization and population
I/O Hub (IOH) uncorrectable error events	Motherboard
Memory ECC uncorrectable and correctable events	Memory DIMMs
CPU uncorrectable error events	Processor
Boot progress events	Power-on, power-off, IPMI, MRC, QPI, BIOS, setup, and boot retries
Service Processor error events	Oracle ILOM

This table lists the server component faults that persist after a system cold boot and the action to clear the fault.

TABLE 5 Clearing Faults for Components

Component	Action to Clear
DDR3 Memory DIMMs	Automatically cleared when replaced
CPU module	Clear fault manually after component replacement
PCIe cards	Clear fault manually after component replacement
Fan module	Automatically cleared when the sensor status is OK
Power supply	Automatically cleared when the sensor status is OK
Disk drive	Automatically cleared when the sensor status is OK

See Also

Components With No Fault Diagnosis

Certain server components do not provide a mechanism to diagnose faults. These include:

- Disk drive
- Lithium battery

See Also

Recovering a Lost Oracle ILOM Password

Oracle ILOM comes configured with a default user account. If you need to change the default Oracle ILOM user account, for example, to recover the password or re-create the default account, you need to prove physical presence.

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▼ How to Recover a Lost Password by Proving Physical Presence

If you need to recover a lost password or re-create the root account, you can use the preconfigured Oracle ILOM `default` user account. The `default` user account cannot be deleted and is available only through a local serial console connection.

1 **Establish a local serial management connection to ILOM and log in to ILOM using the default user account. Refer to the** *Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management CLI Procedures Guide***.**

2 **When prompted by Oracle ILOM, press the Locate button on the server front panel. Refer to "Front Features and Components" in** *Sun Server X2-8 (formerly Sun Fire X4800 M2) Installation Guide***.**

Monitoring Hardware and Environmental Sensors

For more information about indicators and sensors, refer to the *Oracle Integrated Lights Out Manager (ILOM) Daily Management Concepts Guide*.

Description	Link
System indicators, such as LEDs.	"Indicators" on page 57
Sensors capture physical information, including voltages, temperatures, fan speeds, and installation and removal of components.	"Sensors" on page 59
SNMP and PET traps send information about events to the event log and an IPMI baseboard management controller.	"SNMP and PET Traps" on page 63

See Also

- "Identifying and Clearing Faults" on page 51

Indicators

These values represent the state of LEDs on the chassis and other system components. For an illustration of the where the LEDs are, refer to the "Front Panel Indicator Module Overview" in *Sun Server X2-8 (formerly Sun Fire X4800 M2) Service Manual*.

Sensor	Description
OK	The state of the green OK LED: ■ On – system power is on. ■ Fast–Blink – SP is booting. System not ready to turn on. ■ Slow-Blink – Host is booting ■ Stand-By – System power is off. ■ Off – System power is not connected.

Sensor	Description
SERVICE	The state of the amber Service LED: ■ On – The system has a fault. ■ Off – System does not have a fault.
TEMP_FAULT	The state of the amber chassis temperature failure LED: ■ On – The system is outside of normal operating temperature and power-on is not allowed. ■ Off – The system is within normal operating temperature range and power-on is allowed.
LOCATE	The state of the white Locate LED: ■ Fast blink – The Locate LED is blinking to identify the system. ■ Off – The Locate LED is not blinking.

Note – For all NEM indicators, n = 0 or 1.

Sensor	Description
NEMn/OK	The state of the NEM's green LED: ■ On – The NEM is on. ■ Off – The NEM is off.
NEMn/SERVICE	The state of the NEM's amber LED: ■ On – The NEM has a fault. ■ Off – The NEM does not have a fault.
NEMn/OK2RM	The state of the NEM's blue LED: ■ On – The NEM is ready to be removed. ■ Off – The NEM is not ready to be removed.
NEMn/LOCATE	The state of the NEM's locate button/LED: ■ Fast blink – The NEM's Locate LED is blinking to identify the NEM. ■ Off – The NEM's Locate LED is off.
FMn/SERVICE	The state of the fan module and its amber LED. n = 0 — 3: ■ On – The LED is on and the fan module has a fault. ■ Off – The LED is off and the fan module does not have a fault.

Note – For all HDDs indicators, n = 0 through 7.

Sensor	Description
DBP/HDDn/SERVICE	The state of the HDD and its amber LED. ■ On – The HDD has a fault. ■ Off – The HDD has no faults.
DBP/HDDn/OK2RM	The state of the blue OK to Remove LED on the HDD: ■ On – The HDD is ready to remove. ■ Off – The HDD is not ready to be removed.

Note – For all processor module indicators, n = 0 through 3.

Sensor	Description
BL*n*/OK	The state of the green OK LED on the processor module: ■ On – The processor module is running. ■ Slow-blink – The processor module is booting. ■ Off – The processor module is offline.
BL*n*/SERVICE	The state of the amber SERVICE LED on the processor module: ■ On – The processor module has a fault. ■ Off – The processor module does not have a fault.
BL*n*/OK2RM	The state of the blue OK to Remove LED on the processor module: ■ On – The processor module is ready to be removed. ■ Off – The processor module is not ready to be removed.
BL*n*/LOCATE	The state of the Locate button/white LED on the processor module: ■ Fast blink – The Locate LED is blinking. ■ Off – The Locate LED is off.
BL*n*/P*x*/SERVICE	The state of the red Service LED for the CPU on the processor module (x = 0 or 1): ■ On – The CPU has a fault. ■ Off – The CPU does not have a fault.
BL*n*/P*x*/D*y*/SERVICE	The state of the Service LED for one of the DIMMs on the processor module, where: ■ x identifies CPU 0 or CPU 1. ■ y identifies DIMM 0 through DIMM 15. The values are: ■ On – The DIMM has a fault. ■ Off – The DIMM does not have a fault.

See Also

- "Indicators" on page 57
- "Sensors" on page 59
- "SNMP and PET Traps" on page 63

Sensors

Sensors report the state of the server's components.

System Sensors

Sensors report physical information about the server, including voltages, temperatures, fan speeds, and installation and removal of components.

Sensor	Description
PWRBS	Unused
ACPI	System power: ■ 0x0010 – Server is on. ■ 0x0020 – Server is off.
SP/T_AMB	Service processor temperature in degrees.
T_AMB	Ambient chassis temperature: ■ Upper critical temperature = 40° C. ■ Upper non-recoverable temperature = 45° C.
HOT	Discrete temperature sensor on processor modules: ■ 0x0001 = deasserted. Main fans run at normal speed. ■ 0x0002 = asserted. Main fans run at high speed.
VPS	Chassis power consumption in watts.

NEMs

The server supports one or two network expansion modules (NEMs). NEM*n* identifies NEM0 or NEM1.

Sensor	Description
NEM*n*/PRSNT	0x0001 – NEM*n* is absent.
	0x0002 – NEM*n* is present.
NEM*n*/STATE	0x0001 – NEM*n* is running.
	0x0004 – NEM*n* is powered off.
	0x0020 – NEM*n* is ready to be removed.
NEM*n*/ERR	0x0001 – Asserted. NEM*n* has faults.
	0x0002 – Deasserted. NEM*n* has no faults.

Chassis Fan Modules and Fans

The chassis has four fan modules with two fans each.

■ *n* represents fan modules 0 through 3.
■ *x* represents fans 0 or 1.

Sensor	Description
FM*n*/PRSNT	0x0001 – FM*n* is absent.
	0x0002 – FM*n* is present.
FM*n*/ERR	0x0001 – Asserted. FM*n* is absent. This is a fault. Service LED is on.
	0x0002 – Deasserted. FM*n* is not faulty.
FM*n*/F*x*/TACH	Speed of the fan in revolutions per minute.

Power Supply

This section lists the power supply sensors. PS*n* identifies PS0 through PS3.

Sensor	Description
PS*n*/P_IN	Input power for PS*n*.
PS*n*/P_OUT	Output power for PS*n*.
PS*n*/V_IN	Input voltage for PS*n*.
PS*n*/V_12V	Voltage for 12V rail of PS*n*.
PS*n*/V_3V3	Voltage for 3.3V rail of PS*n*.
PS*n*/T_AMB	Ambient temperature sensor for PS*n*.
PS*n*/V_OUT_OK	Discrete sensor for PS*n* output: ■ 0x0001 – Deasserted – PS*n* – output is off. ■ 0x0002 – Asserted – PS*n* – output is on.
PS*n*/V_IN_ERR	PS*n* input voltage error: ■ 0x0001 – Deasserted – PS*n* – input voltage is normal. ■ 0x0002 – Asserted – PS*n* – input voltage error.
PS*n*/V_IN_WARN	PS*n* input voltage warning: ■ 0x0001 – Deasserted – PS*n* – input voltage is normal. ■ 0x0002 – Asserted – PS*n* – input voltage is out of range.
PS*n*/V_OUT_ERR	PS*n* output voltage error: ■ 0x0001 – Deasserted – PS*n* – output voltage is normal. ■ 0x0002 – Asserted – PS*n* – output voltage error.
PS*n*/I_OUT_ERR	PS*n* output current: ■ 0x0001 – Deasserted – PS*n* – output current is normal. ■ 0x0002 – Asserted – PS*n* – output current error.

Sensor	Description
PS*n*/I_OUT_WARN	PS*n* output current warning: ■ 0x0001 – Deasserted – PS*n* – output current is normal. ■ 0x0002 – Asserted – PS*n* – output current is out of range.
PS*n*/T_ERR	PS*n* temperature fault: ■ 0x0001 – Deasserted – PS*n* temperature is OK. ■ 0x0002 – Asserted – PS*n* temperature error.
PS*n*/T_WARN	PS*n* temperature warning: ■ 0x0001 – Deasserted – PS*n* temperature is OK. ■ 0x0002 – Asserted – PS*n* temperature warning.
PS*n*/FAN_ERR	PS*n* fan fault: ■ 0x0001 – Deasserted – PS*n* fans OK. ■ 0x0002 – Asserted – PS*n* fans faulty.
PS*n*/FAN_WARN	PS*n* fan warning: ■ 0x0001 – Deasserted – PS*n* fans OK. ■ 0x0002 – Asserted – PS*n* fans warning.
PS*n*/ERR	PS*n* error: ■ 0x0001 – Deasserted – PS*n* OK. ■ 0x0002 – Asserted – PS*n* fault.
PS*n* PRSNT	PS*n* presence: ■ 0x0001 – PS*n* is absent. Chassis is faulted when PS*n* is missing. ■ 0x0002 – PS*n* is present. Chassis is OK.

Hard Disk Drive Sensors

The server supports eight hard disk drives (HDDs). HDD*n* identifies HDD0 through HDD7.

Sensor	Description
DBP/HDD*n*/PRSNT	HDD*n* presence: ■ 0x0001 – HDD*n* is absent. This is not a fault. ■ 0x0002 – HDD is present.
DBP/HDD*n*/STATE	HDD*n* state: ■ 0x0001 – HDD*n* is normal. ■ 0x0002 – HDD is faulted.

Processor Modules (CMODs)

The server contains two or four processor modules. BL*n* identifies processor modules BL0 through BL3.

Sensor	Example	Description
BL*n*/PRSNT	0x02	0x02 = present, 0x01 = not present. - Processor module 0 and 3 must be present. - Processor modules 1 and 2 are optional.
BL*n*/VPS	290 Watts	Power used by processor module.
BL*n*/STATE	0x01	0x0: Unknown 0x01: Running 0x04: Powered off 0x10: Off duty
BL*n*/ERR	0x01	0x01: Predictive failure deasserted. 0x02: Predictive failure asserted.
BL*n*/HOT	0x01	0x1: Deasserted, CMOD is cool/normal. 0x02: Asserted, CMOD is hot and blasting the fan.
BL*n*/FEM*x*/PRSNT	0x02	Each processor module can support one or two fabric expansion modules (FEMs): FEM0 and FEM1.
Bl*n*/REM/PRSNT	0x01	Each processor module can support a single RAID expansion module (REM).
EM*x.x*/PRSNT	0x01	The server provides eight PCIe expansion module slots. Each processor module is associated with two slots. 0.0 – slot 0 – BL0 0.1 – slot 1 – BL0 1.0 – slot 2 – BL1 1.1 – slot 3 – BL1 2.0 – slot 4 – BL2 2.1 – slot 5 – BL2 3.0 – slot 6 – BL3 3.1 – slot 7 – BL3
BL*n*/Px/PRSNT	0x02	Each processor module supports two processors, P0 and P1.
BL*n*/T_AMB	27 degrees C	Processor module ambient temperature.

SNMP and PET Traps

SNMP traps are generated by SNMP agents that are enabled 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.

Platform Event Trap (PET) events are generated by systems with Alert Standard Format (ASF) or an IPMI baseboard management controller. The PET events provide advance warning of possible system failures.

The MIBs are available on the Tools and Drivers CD and can be downloaded from
http://support.oracle.com.

See Also

- "Indicators" on page 57
- "Sensors" on page 59
- "SNMP and PET Traps" on page 63

The following table shows the relationship between traps and sensors.

Sensor	Trap/Event/Severity	Description
NEM	sunHwTrapIOFault event fault.chassis.device.fail MAJOR	A component in the IO subsystem is suspected of causing a fault.
	sunHwTrapIOFaultCleared event fault.chassis.device.fail INFORMATIONAL	An IO subsystem component fault has been cleared.
PS	sunHwTrapPowerSupplyFault event fault.chassis.env.power.loss MAJOR	A power supply component is suspected of causing a fault.
	sunHwTrapPowerSupplyFaultCleared event fault.chassis.env.power.loss INFORMATIONAL	A power supply component fault has been cleared.

Sensor	Trap/Event/Severity	Description
T_AMB PSn/T_AMB BLn/T_AMB n = 0 through 3	sunHwTrapTempCritThreshold Exceeded Upper critical threshold exceeded MAJOR	A temperature 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.
	sunHwTrapTempCritThreshold Deasserted Upper critical threshold no longer exceeded INFORMATIONAL	A temperature 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.
	sunHwTrapTempFatalThreshold Exceeded Upper fatal threshold exceeded 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.
	sunHwTrapTempFatalThreshold Deasserted Upper fatal threshold no longer exceeded 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.
BLn/T_AMB n = 0 through 3	sunHwTrapTempNonCritThreshold Exceeded Upper noncritical threshold exceeded MINOR	A temperature sensor has reported that its value has gone above an upper non-critical threshold setting or below a lower non-critical threshold setting. The sunHwTrapThresholdType object indicates whether the threshold was an upper or lower.
	sunHwTrapTempOk Upper noncritical threshold no longer exceeded INFORMATIONAL	A temperature sensor has reported that its value is in the normal operating range.

Sensor	Trap/Event/Severity	Description
HOT BL*n*/HOT	sunHwTrapComponentError Assert MAJOR	A sensor has detected an error. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.
	sunHwTrapComponentOk Deassert INFORMATIONAL	A sensor has returned to its normal state. This generic 'component' trap is generated when the SNMP agent does not recognize the component type.
PS*n*/V_IN_ERR PS*n*/V_IN_WARN PS*n*/V_OUT_ERR PS*n*/I_OUT_ERR PS*n*/I_OUT_WARN PS*n*/T_ERR PS*n*/T_WARN PS*n*/FAN_ERR PS*n*/FAN_WARN PS*n*/ERR *n* = 0 through 3	sunHwTrapPowerSupplyError Assert MAJOR	A power supply sensor has detected an error.
	sunHwTrapPowerSupplyOk Deassert INFORMATIONAL	A power supply sensor has returned to its normal state.
ACPI	sunHwTrapComponentError MAJOR One of: ■ `ACPI_ON_WORKING DEASSERT` ■ `ACPI_ON_WORKING DEASSERT` ■ `ACPI_SOFT_OFF ASSERT` ■ `ACPI_SOFT_OFF DEASSERT`	A sensor has detected an error. This generic component trap is generated when the SNMP agent does not recognize the component type.
PS*n*/V_OUT_OK *n* = 0 through 3	sunHwTrapPowerSupplyError Deassert MAJOR	A power supply sensor has detected an error.
	sunHwTrapPowerSupplyOk Assert INFORMATIONAL	A power supply sensor has returned to its normal state.

Sensor	Trap/Event/Severity	Description
DBP/HDD*n*/STATE *n* = 0 through 7	sunHwTrapHardDriveStatus DRIVE_FAULT ASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.
	sunHwTrapHardDriveStatus DRIVE_FAULT DEASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.
	sunHwTrapHardDriveStatus PREDICTIVE_FAILURE ASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.
	sunHwTrapHardDriveStatus PREDICTIVE_FAILURE DEASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.
	sunHwTrapHardDriveStatus HOT_SPARE ASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.
	sunHwTrapHardDriveStatus HOT_SPARE DEASSERT INFORMATIONAL	The hard drive identified by sunHwTrapComponentName has changed state.

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