Sun Fire™ X4150, X4250, and X4450 Servers Diagnostics Guide

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Contents

Preface

The *Sun Fire X4150, X4250, and X4450 Servers Diagnostics Guide* contains information and procedures for using available tools to diagnose problems with the servers.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Fire X4150 Safety and Compliance Guide* and the *Sun Fire X4250 and X4450 Safety and Compliance Guide.*

Related Documentation

The document set for the Sun Fire™ X4150, X4250, and X4450 Servers is described in the *Where To Find Sun Fire X4150, X4250, and X4450 Servers Documentation* sheet that is packed with your system. You can also find the documentation at http://docs.sun.com.

Translated versions of some of these documents are available at http://docs.sun.com. Select a language from the drop-down list and navigate to the Sun Fire X4150, X4250, or X4450 servers document collection using the Product category link. Available translations for the Sun Fire X4150, X4250, and X4450 Servers include Simplified Chinese, Traditional Chinese, French, Japanese, and Korean.

English documentation is revised more frequently and might be more up-to-date than the translated documentation. For all Sun documentation, go to the following URL: http://docs.sun.com

Typographic ConventionsThird-Party

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

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

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Initial Inspection of the Server

This chapter includes the following topics:

- "Service Troubleshooting Flowchart" on page 1
- "Gathering Service Information" on page 2
- "System Inspection" on page 3

Service Troubleshooting Flowchart

Use the following flowchart as a guideline for using the information in this book to troubleshoot the server.

TABLE 1-1   Troubleshooting Flowchart

To perform this task	Refer to this section
Gather initial service information.	"Gathering Service Information" on page 2
Investigate any power-on problems.	"Troubleshooting Power Problems" on page 3
Perform external visual inspection and internal visual inspection.	"Externally Inspecting the Server" on page 3 "Internally Inspecting the Server" on page 4
Troubleshoot DIMM problems.	"Troubleshooting DIMM Problems" on page 7
View BIOS event logs.	"Viewing Event Logs" on page 37
View service processor logs and sensor information.	"Using the ILOM Service Processor Web Interface to View System Information" on page 47
Run diagnostics software.	"Using Pc-Check Diagnostics Software" on page 13 "Using SunVTS Diagnostic Software" on page 33

Gathering Service Information

The first step in determining the cause of a problem with the server is to gather information from the service-call paperwork or the onsite personnel. Use the following general guideline steps when you begin troubleshooting.

To gather service information:

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. **Take note of 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.**

System Inspection

Controls that have been improperly set and cables that are loose or improperly connected are common causes of problems with hardware components.

Troubleshooting Power Problems

- If the server will power on, skip this section and go to "Externally Inspecting the Server" on page 3.
- If the server will not power on, check the following:
  - Check that AC power cords are attached firmly to the server's power supplies and to the AC sources.
  - Check that the main cover is firmly in place.

    An intrusion switch on the motherboard automatically shuts down the server power to standby mode when the cover is removed.

Externally Inspecting the Server

To perform a visual inspection of the external system:

1. **Inspect the external status indicator LEDs, which can indicate component malfunction.**

   For the LED locations and descriptions of their behavior, see "External Status Indicator LEDs" on page 39.

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

3. **If the problem is not evident, continue with the next section,** "Internally Inspecting the Server" on page 4**.**

Internally Inspecting the Server

To perform a visual inspection of the internal system:

1. **Choose a method for shutting down the server from main power mode to standby power mode. See** FIGURE 1-1**,** FIGURE 1-2**, and** FIGURE 1-3 **for the location of the power button for each platform.**

   - **Graceful shutdown** – Use a ballpoint pen or other nonconductive stylus to press and release the Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to standby power mode immediately.

   - **Emergency shutdown** – Use a ballpoint pen or other nonconductive stylus to press and hold the Power button for four seconds to force main power off and enter standby power mode.

⚠ **Caution –** Performing an emergency shutdown can cause open files to become corrupt. Use an emergency shutdown only when necessary.

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.

⚡ **Caution –** When you use the Power button to enter standby power mode, power is still directed to the service processor and power supply fans, indicated when the Power/OK LED is flashing. To completely power off the server, you must disconnect the AC power cords from the back panel of the server.

FIGURE 1-1   X4150 Server Front Panel Power Button
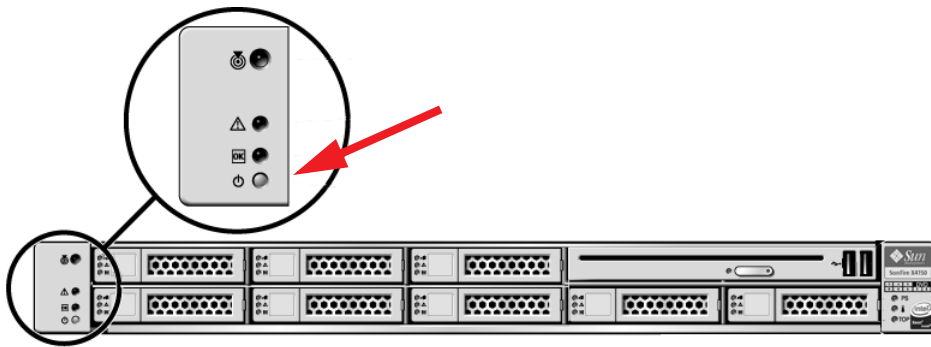
FIGURE 1-2   X4250 Server Front Panel Power Button
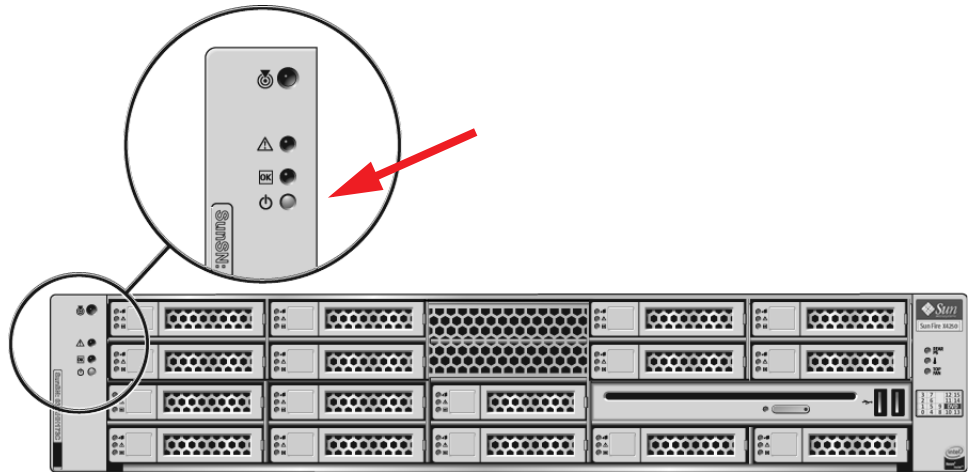
FIGURE 1-3   X4450 Server Front Panel Button
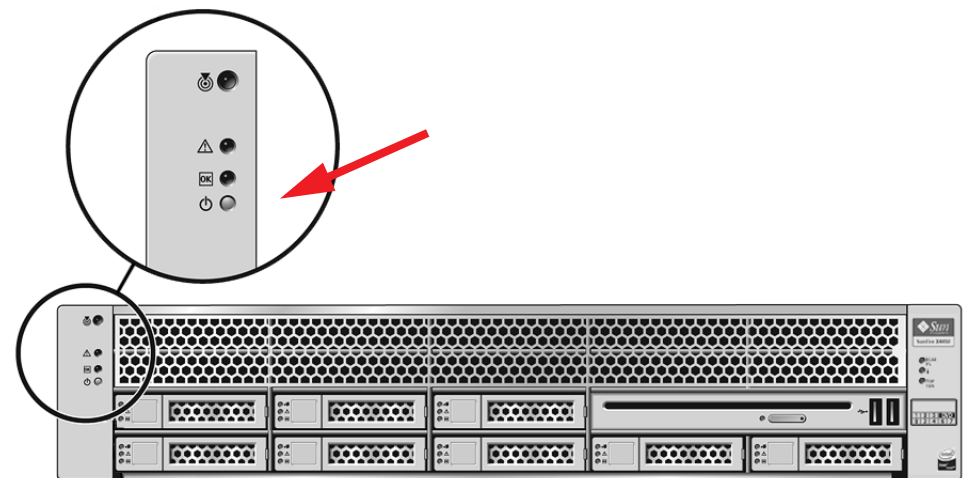
2. **Remove the server cover.**

    For instructions on removing the server cover, refer to your server's service manual.

3. **Inspect the internal status indicator LEDs. These can indicate component malfunction.**

    For the LED locations and descriptions of their behavior, see "Internal Status Indicator LEDs" on page 43.

Note – The server must be in standby power mode to view the internal LEDs.

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

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

6. **Verify that any after-factory components are qualified and supported.**

   For a list of supported PCI cards and DIMMs, refer to your server's service manual.

7. **Check that the installed DIMMs comply with the supported DIMM population rules and configurations, as described in the service manual for your product.**

8. **Replace the server cover.**

9. **To restore the server to main power mode (all components powered on), use a ballpoint pen or other nonconductive stylus to press and release the Power button on the server front panel. See** FIGURE 1-1**,** FIGURE 1-2**, and** FIGURE 1-3**.**

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

10. **If the problem with the server is not evident, you can obtain additional information by viewing the power-on self test (POST) messages and BIOS event logs during system startup. Continue with** "Viewing Event Logs" on page 37**.**

Troubleshooting DIMM Problems

This chapter describes how to detect and correct problems with the server's Dual Inline Memory Modules (DIMMs). It includes the following sections:

Note – Refer to the service manual or service label for the system that you are servicing for information on DIMM population rules.

DIMM Replacement Guidelines

Replace a DIMM when one of the following events takes place:

- The DIMM fails memory testing under BIOS due to Uncorrectable Memory Errors (UCEs).
- UCEs occur and investigation shows that the errors originated from memory.
- More than 24 Correctable Errors (CEs) originate in 24 hours from a single DIMM and no other DIMM is showing further CEs.

Note – If more than one DIMM has experienced multiple CEs, other possible causes of CEs must be ruled out by a qualified Sun Support specialist before replacing any DIMMs.

Retain copies of the logs showing the memory errors to send to Sun for verification prior to calling Sun.

How DIMM Errors Are Handled by the System

This section describes the following topics:

- "Uncorrectable DIMM Errors" on page 8
- "Correctable DIMM Errors" on page 8
- "DIMM Fault LEDs" on page 9

Uncorrectable DIMM Errors

For all operating systems, the behavior is the same for uncorrectable errors (UCEs):

1. When a UCE occurs, the memory controller causes an immediate reboot of the system.

2. During reboot, the BIOS checks the Machine Check registers and determines that the previous reboot was due to a UCE.

   The uncorrectable ECC error is displayed in the service processor's system event log (SEL) as shown here:

   ```
   Memory | Uncorrectable ECC | Asserted | DIMM A0
   ```

Correctable DIMM Errors

If a DIMM has 24 or more correctable errors (CE)s in 24 hours, it is considered defective and should be replaced.

CEs will be captured in the SEL and light the fault LED after 24 single bit errors are detected in 24 hours. They are reported or handled in the supported operating systems as follows:

- Windows server:

  a. A Machine Check error-message bubble appears on the task bar.

  b. Open the Event Viewer to view errors.

     Access the Event Viewer through this menu path:

     ```
     Start-->Administration Tools-->Event Viewer
     ```

  c. View individual errors (by time) to see the details of the error.

- Solaris:

  Solaris FMA reports and sometimes retires memory with correctable Error Correction Code (ECC) errors. See your Solaris documentation for details.

  To view ECC errors, use the following command:

  ```
  fmdump -eV
  ```

DIMM Fault LEDs

When you press the Remind button on the motherboard (or memory tray for x4450), the LEDs next to the DIMMs flash to indicate that the system has detected 24 or more CEs in a 24-hour period on that DIMM.

- DIMM fault LED is off: The DIMM is operating properly.
- DIMM fault LED is flashing (amber): At least one of the DIMMs in this DIMM pair has reported 24 CEs within a 24-hour period or a UE (uncorrectable error).

See FIGURE 2-1 and FIGURE 2-2 for the locations of the Remind button and LEDs on the motherboard.

FIGURE 2-1 DIMMs and LEDs on Motherboard (X4150 and X4250)
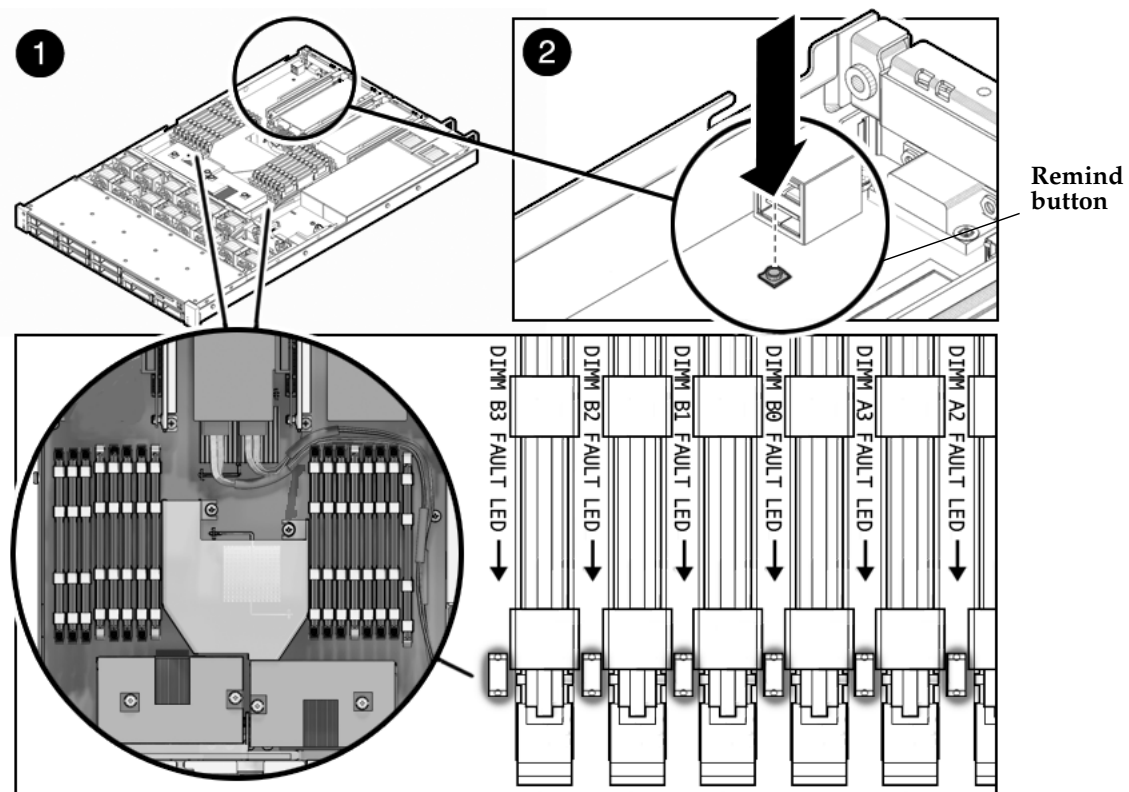
FIGURE 2-2   DIMMs and LEDs on Mezzanine (x4450)
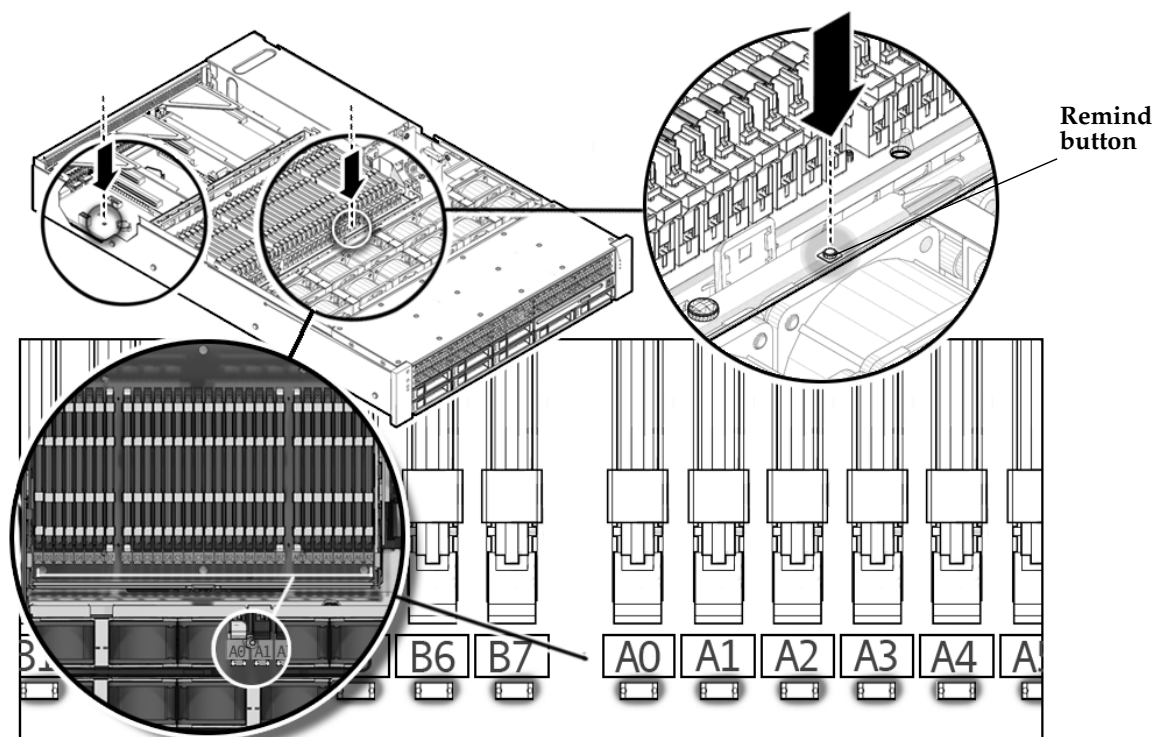
Isolating and Correcting DIMM ECC Errors

If your log files report an Error Correction Code (ECC) error or a problem with a DIMM, complete the following steps until you can isolate the fault.

In this example, the log file reports an error with the DIMM in D0. The fault LED on DIMM D0 is on.

To isolate and correct DIMM ECC errors:

1. **If you have not already done so, shut down your server to standby power mode and remove the cover.**

2. **Inspect the installed DIMMs to ensure that they comply with the DIMM population rules in your product service manual.**

3. **Press the Remind button and inspect the DIMM fault LEDs. See** FIGURE 2-1 **and** FIGURE 2-2**.**

   For CEs and UCEs, a flashing LED identifies the DIMM where the error is located.

4. **Disconnect the AC power cords from the server.**

Caution – Before handling components, attach an antistatic wrist strap to a chassis ground (any unpainted metal surface). The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

Note – To recover fault information, look in the SP SEL, as described in the *Sun Integrated Lights Out Manager 2.0 User's Guide*.

5. **Remove the DIMMs from the DIMM slots.**

   Refer to your server's service manual for details.

6. **Visually inspect the DIMMs for physical damage, dust, or any other contamination on the connector or circuits.**

7. **Visually inspect the DIMM slot for physical damage. Look for cracked or broken plastic on the slot.**

8. **Dust off the DIMMs, clean the contacts, and install them.**

Caution – Use only compressed air to dust DIMMs.

9. **If there is no obvious damage, replace any failed DIMMs.**

   For UCEs, if the LEDs indicate a fault with the pair, replace both DIMMs. Ensure that they are inserted correctly with ejector latches secured.

10. **Reconnect AC power cords to the server.**

11. **Power on the server and run the diagnostics test again.**

12. **Review the log file.**

    If the tests identify the same error, the problem is in the CPU, not the DIMMs.

Using Pc-Check Diagnostics Software

This chapter assists you with using the Diagnostics application on the Tools and Drivers CD that is packaged with your system.

Diagnostic output is accessible on systems that are running supported Linux or Solaris operating systems. If you are having specific problems with your system, use the Pc-Check Diagnostics software to diagnose and resolve these issues.

The following sections are included in this chapter:

Pc-Check Diagnostics Overview

Sun Fire X4150, X4250, and X4450 server diagnostics are contained in the DOS-based Pc-Check utility. This program can be accessed and executed only from the Tools and Drivers CD. Pc-Check was designed to detect and test all motherboard components, ports, and slots.

If you encounter any hardware-related error message (such as memory errors or hard disk errors) on your server, run one of the following:

■ Advanced Diagnostics Test: A specific hardware component test

■ Immediate Burn-in Test: A server diagnostic test script

The following procedure describes how to access these test options from the Tools and Drivers CD.

Accessing the Pc-Check Diagnostics Software

Do one of the following, depending on which method you are using to access the Pc-Check diagnostics software:

■ If your server has a DVD drive installed:

   a. Insert the Tools and Drivers CD into your DVD drive and reboot the system.

   b. Type 1 **to run the hardware diagnostics software.**

■ If you want to run the Pc-Check software from a PXE server: see Appendix D for instructions.

■ If you are running the Pc-Check software through the ILOM web interface, do the following:

   a. Select Remote Control -> Diagnostic tab.

   b. Select one of the following:

   ■ Enabled - Launches the quick diagnostics tests, which run for 3 minutes.

   ■ Extended - Launches the 30 minute diagnostic test.

   ■ Manual - Launches the full version of diagnostics, which can run all tests. This option gives you the same results as booting diagnostics from the Tools and Drivers CD.

   c. Click Save.

d. Reboot the Server.

Refer to the *Integrated Lights Out Manager 2.0 User's Guide* for more information on using the ILOM web interface.

The system boots to the Pc-Check main menu.

The system information loads, the Diagnostics main menu opens, and the following menu options are displayed:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About PC-CHECK
- Exit to DOS

To run a specific hardware component test, select "Advanced Diagnostics Test." To run one of the test scripts supplied by Sun, select "Immediate Burn-in Testing."

Navigate through the menu items by pressing the arrow keys to move to a menu selection. Use the Enter key to select a menu selection, and the ESC key to exit a menu. Navigation instructions are shown at the bottom of each screen.

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

System Information Menu Options

describes each option in the System Information menu.

TABLE 3-1   System Information Menu Options

Option	Description
System Overview	Includes basic information about your system, motherboard, BIOS, processor, memory cache, drives, video, modem, network, buses, and ports.
Hardware ID Image Menu	Enables you to create a document showing information about your system, including comparisons between the updates and the newest versions of your system. XML is the format used to create and display this information, though you can also choose a text (.txt) format.
System Management Information	Provides information obtained from the system about the BIOS type, system, motherboard, enclosure, processors, memory modules, cache, slots, system event log, memory array, memory devices, memory device mapped addresses, and system boot.
PCI Bus Information	Includes details about specific devices from `pci-config` space within the system, similar to the System Management Information section.
IDE Bus Information	Shows the master/slave devices on the primary and secondary IDE controllers.
PCMCIA/CardBus Info	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Interrupt Vectors	Lists and details device interrupt vector information.
IRQ Information	Shows hardware interrupt assignments.
Device Drivers	Shows device drivers loaded under Open DOS.
APM Information	Tests the Advanced Power Management (APM) capabilities of the system. You can choose to change the power state, view the power status, indicate CPU usage, get a PM event, or change the interface mode.
I/O Port Browser	Shows the I/O port assignment for the hardware devices on the system.
Memory Browser	Enables you to view the mapped memory for the entire system.
Sector Browser	Reads sector information from the hard disks and DVD disks sector by sector.

TABLE 3-1   System Information Menu Options *(Continued)*

Option	Description
CPU Frequency Monitor	Tests the processor speed.
CMOS RAM Utilities	Shows the CMOS settings of the system.
SCSI Utilities	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Text File Editor	Opens a text file editor.
Start-Up Options	Enables you to set up options for diagnostics testing.

Advanced Diagnostics Tests

Advanced Diagnostics Tests Menu Options

TABLE 3-2 gives the name and a brief description of each option in the Advanced Diagnostics Tests menu.

TABLE 3-2   Advanced Diagnostics Tests Menu Options

Option	Description
Processor	Details information about the processor, and includes a Processor Tests menu to test the processor on the system.
Memory	Details information about the memory, and includes a Memory Tests menu to test the memory on the system. Also lists each type of memory in the system, such as system, cache, or video memory.
Motherboard	Details information about the motherboard, and includes a Motherboard Tests menu to test the motherboard on the system.
Diskettes	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Hard Disks	Details information about the hard disk, and includes a Hard Disk Tests menu to test hard disks on the system. Refer to "Testing the Hard Disk" on page 19, for detailed information about testing hard disks and script information.

TABLE 3-2   Advanced Diagnostics Tests Menu Options *(Continued)*

Option	Description
CD-ROM/DVD	Includes a CD-ROM/DVD menu to test DVD devices on the system.
ATAPI Devices	Details information about devices attached to the IDE controllers on the system other than a DVD or hard disks (for example, zip drives).
Serial Ports	Details information about the serial port, and includes a Serial Ports Tests menu to test serial ports on the system. Note: In order for the Serial Port test to pass, the COM1 entry in the BIOS Setup Screen must be set to "System". The use of a serial port Loopback connector might also be required.
Parallel Ports	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Modems	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
ATA	Includes an ATA test menu.
USB	Details information about the USB devices on the system, and includes a USB Tests menu to test the USB.
FireWire	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Network	Performs network register controller tests.
Keyboard	Includes a Keyboard Test menu with options for performing different tests on the keyboard.
Mouse	Details information about the mouse, and includes a menu to test the mouse on the system.
Joystick	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Audio	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Video	Details information about the video card. Initially, the monitor might flicker, but then it brings up a Video Test Options menu that enables you to perform various video tests.
Printers	Not relevant to the Sun Fire X4150, X4250, and X4450 servers.
Firmware - ACPI	Details information about Advanced Configurable Power Interface (ACPI), and includes an ACPI Tests menu to test ACPI.

Testing the Hard Disk

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

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

3. **From the Select Drive menu, choose the hard disk you are testing.**

   The Hard Disk Diagnostics window opens, showing both the information for the hard disk you have selected and the Hard Disk Tests menu.

   The Hard Disk Tests menu displays the following options:

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

The Media Test options include the Read Test, the Read Verify Test, the Non-Destructive Write Test, and the Destructive Write Test. These tests are relevant to testing the media associated with the hard drive hardware, such as the physical disk.

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

The Device Test options include the Mechanics Stress Test and the Internal Cache Test. These tests are relevant to testing non-media-related devices associated with the hard drive hardware, such as the head and internal cache.

In addition to choosing any of these tests, you can also define several parameters of the test.

You can change the parameters within the Test Settings option. Your options within Test Settings include the following:

- **Media Test Settings**

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

- **Device Test Settings**

  Enables you to select the test time durations of the devices and the test level.

- **Number of Retries**

  Enables you to select the number of times to retry testing a device before terminating the test.

- **Maximum Errors**

  Enables you to select the number of errors allowed before terminating the test.

- **Check SMART First**

  SMART stands for Smart Monitoring Analysis Reporting Test.

- **HPA Protection**

  HPA stands for Host Protected Area.

- **Exit**

Burn in Tests

Immediate Burn-in Testing

The Immediate Burn-in Testing option enables you to run burn-in test scripts on your server.

This section includes the following topics:

-
-
-

Full System Tests

Three scripts have already been created for testing your system:

- `quick.tst` – This script performs a high-level test of all hardware components, including those components that require user input, as well as a more in-depth memory test. The user must interact with the Pc-Check software to progress through these interactive tests. The tests cannot be run unattended and do not contain "timeout" facilities. The interactive tests wait until the user provides the correct input.

- `noinput.tst` – This script is used as a first triage of any hardware-related problems or issues. The script performs a high-level test of most hardware components, excluding those components that require user input (keyboard, mouse, sound, video). This test does not require user input.
- `full.tst` – This script performs the most detailed and comprehensive test on all hardware components, including those components that require user input. This script contains a more in-depth memory test than `quick.tst`, as well as external port tests (which might require loopback connectors). The user must interact with the test utility to progress through these interactive tests.

Tip – Each of these scripts tests the operating status of your entire system. If you want to test only a certain percentage of your system's hard drives, refer to "Testing the Hard Disk" on page 19 to change the test options.

When you select the Immediate Burn-in Testing menu option, the Continuous Burn-in Testing window is displayed. The screen includes the list of options shown in TABLE 3-3 for running the tests. When a `quick.tst`, `noinput.tst`, or `full.tst` script is loaded, the defaults indicated in the third column are automatically loaded.

TABLE 3-3   Continuous Burn-in Testing Options

Option	Default – General	Default Using `quick.tst`, `noinput.tst`, **or** `full.tst` **Script**	All Possible Choices
Pass Control	Overall Time	Overall Passes	Individual Passes, Overall Passes, or Overall Time
Duration	01:00	1	Any number to designate the time duration of the test
Script File	N/A	`quick.tst`, `noinput.tst`, or `full.tst`	`quick.tst`, `noiniput.tst`, or `full.tst`
Report File	None	None	User-defined
Journal File	None	`D:\noinput.jrl`, `D:\quick.jrl`, or `D:\full.jrl`	User-defined
Journal Options	Failed Tests	All Tests, Absent Devices, and Test Summary	Failed Tests, All Tests, Absent Devices, and Test Summary
Pause on Error	N	N	Y or N

TABLE 3-3   Continuous Burn-in Testing Options *(Continued)*

Option	Default – General	Default Using `quick.tst`, `noinput.tst`, **or** `full.tst` **Script**	All Possible Choices
Screen Display	Control Panel	Control Panel	Control Panel or Running Tests
POST Card	N	N	Y or N
Beep Codes	N	N	Y or N
Maximum Fails	Disabled	Disabled	1-9999

Component Tests

There are also a number of tests that can be performed on individual components. Each test is a continuous loop that last for 6 minutes.

The following scripts are available for testing specific components:

- `cdrom.tst` - Tests the CD-ROM in the system.
- `cpu.tst` - Tests all CPUs in the system.
- `hdiskx.tst` - Tests hard disk *x* in the system. Where *x* is the number of the hard drive that you are testing (1...16).

   Note: the actual hard disk test by default last 10 minutes.
- `mboard.tst` - Tests the motherboard in the system.
- `video.tst` - Tests the video adapter in the system.

Running the Immediate Burn-in Tests

To load one of the scripts available to test the devices on your system, do the following:

● **From the main menu, choose Immediate Burn-in Testing.**

   The top portion of the window lists the options described in TABLE 3-3, and the bottom portion of the window lists the following Burn-in menu options:

   ■ **Load Burn-in Script**

      To use a pre-written test: Enter one of the following: **quick.tst**, **noinput.tst**, or **full.tst**

      To use a script that you have created and saved: enter **d:***testname***.tst,** where *testname* is the name of the script that you have created.

- **Save Burn-in Script**

  To save a burn-in script that you have created, enter **d:***testname***.tst**, where *testname* is the name of the script that you have created.

- **Change Options**

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

- **Select Tests**

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

- **Perform Burn-in Tests**

  Runs the currently loaded burn-in test script.

Tip – The memory tests in Pc-Check detect single-bit ECC failures and report them down to an individual DIMM.

Deferred Burn-in Testing

You can use the Deferred Burn-in Testing option to create and save your own scripts to run at a later time.

● **From the main menu, choose Deferred Burn-in Testing.**

  The top portion of the window lists the options described in TABLE 3-3, and the bottom portion of the window lists the following Burn-in menu options:

- **Load Burn-in Script**

  To use a pre-written test: Enter one of the following: **quick.tst**, **noinput.tst**, or **full.tst**

  To use a script that you have created and saved: enter **d:***testname***.tst,** where *testname* is the name of the script that you have created.

- **Save Burn-in Script**

  To save a burn-in script that you have created, enter **d:***testname***.tst**

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

- **Change Options**

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

- **Select Tests**

  Opens a listing of all the possible types of tests available for you to run for the currently loaded test script.

Create Diagnostic Partition Option

The diagnostic partition is preinstalled on the server. You need to reinstall the diagnostic partition only if you have reformatted your hard drive. Using the Erase Primary Boot Hard Disk utility on the Tools and Drivers CD preserves the diagnostic partition.

The Create Diagnostic Partition option installs a diagnostic partition on the first bootable disk seen by the server. The first bootable disk is on the primary HDD device.

Note – If you are running the Pc-Check Diagnostics software from a PXE server, you do not need to follow the instructions in Appendix D.

The following sections explain how to create and access the diagnostic partition on the server:

- "Removing Existing Partitions From a Hard Disk" on page 25
- "Adding a Diagnostic Partition to the First Bootable Disk" on page 26
- "Creating a Log File on the Diagnostic Partition" on page 26
- "Accessing the Diagnostic Partition on a Red Hat Linux System" on page 27
- "Accessing the Diagnostic Partition on the Solaris 10 Operating System" on page 28
- "Accessing the Diagnostic Partition on the Windows Server 2003 Operating System" on page 29

Removing Existing Partitions From a Hard Disk

The Create Diagnostic Partition option creates a diagnostic partition on a hard disk only if that hard disk is completely free of any partitions. You need to delete any existing partitions from a hard disk if you plan to use the hard disk to create a diagnostic partition on it.

Caution – Removing all hard disk partitions destroys all data on the disk.

There are two ways to remove existing partitions from the hard disk:

- Use the Erase Primary Boot Hard Disk utility (Option 3 on the Tools and Drivers CD main menu).
- Use the following procedure:

1. **Insert the Tools and Drivers CD into the DVD tray.**

2. **Reboot the server.**

3. **From the Tools and Drivers CD main menu, type 3 to exit to DOS.**

4. **Type fdisk at the command prompt, and press the Enter key.**

5. **Type 4 to select an alternate fixed disk.**

   The second hard disk as seen from fdisk is the first bootable disk of the system. The first hard disk as seen from fdisk is the bootable Tools and Drivers CD.

Caution – When performing the following tests, be careful not to delete any operating system partitions that you want to keep. Removing hard disk partitions destroys all data on the disk.

6. **Type 2 to delete the DOS partition.**

7. **Type 1 or 2 depending on the type of partition you want to delete.**

8. **Type the number of the partition you want to delete.**

9. **Type Y to erase the data and the partition.**

10. **Repeat Step 6 through Step 9 until all partitions have been deleted.**

11. **Press the Esc key to exit, and press any key to reboot the server.**

Adding a Diagnostic Partition to the First Bootable Disk

Pc-Check can view only the first or second hard disk on the system from the boot loader. The software automatically installs the diagnostic partition on the first bootable disk.

To add the diagnostic partition on the first bootable disk:

1. **Insert the Tools and Drivers CD into the DVD tray.**

2. **Reboot the server.**

3. **At the Tools and Drivers CD main menu, type 1 to run Hardware Diagnostics.**

4. **From the main menu, choose Create Diagnostic Partition.**
   - If the first bootable disk is clear of partitions, the Sun Microsystems Partitioning Utility window appears. It states: "Your primary hard disk is not partitioned. Would you like to partition it now?"
     - **Select Yes and press Enter.**

       A window appears, stating, "Partitioning complete. Your machine will now be restarted."
   - If the first bootable disk is not clear of partitions, a window appears stating that the software is unable to create a hardware diagnostic partition because there are already partitions on the disk.
     - **If this happens, go to** "Removing Existing Partitions From a Hard Disk" on page 25 **to remove the partitions from the disk**.
     - **Repeat** Step 1 **through** Step 4 **of this procedure**.

5. **Press Enter to reboot your server.**

Creating a Log File on the Diagnostic Partition

All the scripts that are loadable with the hardware diagnostics software are predefined, with logging to the diagnostic partition enabled. The names of log files correspond to the name of the script. For example, a script named `noinput.tst` creates a log file named `noinput.jrl`.

The following procedure shows an example of how to create and access a log file on the diagnostic partition for the `noinput.tst` script.

1. **Insert the Tools and Drivers CD into the DVD tray.**

2. **Reboot the server.**

3. **From the Tools and Drivers CD main menu, choose 1 to run Hardware Diagnostics.**

4. **From the Hardware Diagnostics main menu, choose Immediate Burn-In Testing.**

5. **Select Load Burn-in Script.**

6. **Type `noinput.tst` and press Enter.**

   If you are using a test you have created yourself, you need to enter **`d:\`***testname*.**`tst`** into the Load Burn-in Script field, where *testname* is the name of the test you have created.

7. **Select Perform Burn-in Tests to run the script.**

8. **When the tests are complete, press the Esc key to exit the Display Results window.**

9. **Select Exit to DOS and press Enter.**

10. **At the DOS prompt, type the following:**

    ```
    C:> d:
    ```

11. **Type the following to list the contents of the diagnostic partition:**

    ```
    D:> dir
    ```

    The `noinput.jrl` log appears.

Accessing the Diagnostic Partition on a Red Hat Linux System

To access the diagnostic partition on a Red Had Linux system:

1. **Remove the Tools and Drivers CD from the DVD tray.**

2. **Reboot the server and start the Red Hat Linux operating system.**

3. **Log in as root (superuser).**

4. **Determine if your diagnostic partition has been configured to be mounted by typing the following command:**

   # **ls /diagpart**

   - If this command fails to list the log files created by the hardware diagnostics software, then the operating system has never been configured to mount the diagnostic partition. Continue to Step 5.

   - If this command succeeds in listing the log files created by the hardware diagnostics software, then the operating system has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You do not need to continue this procedure.

5. **Insert the Tools and Drivers CD into the DVD tray.**

6. **When the CD is mounted, open a terminal window.**

7. **Type the following command:**

   # **cd** *mountpoint***/drivers/linux/***linux_version*

   Where *mountpoint* is the CD mountpoint and *linux_version* is the version of Linux that you have installed. For example:

   # **cd /mnt/cdrom/drivers/linux/red_hat**

8. **Type the following to install the diagnostic partition:**

   # **./install.sh**

9. **Press Enter.**

   The following lines appear if the diagnostic partition is mounted successfully:

   ```
   Mounting Diagnostic Partition
   Installation Successful
   ```

10. **Type the following command:**

    # **ls /diagpart**

    The contents of the diagnostic partition are listed.

Accessing the Diagnostic Partition on the Solaris 10 Operating System

To access the diagnostic partition on the Solaris 10 operating system (OS):

1. **Remove the Tools and Drivers CD from the DVD tray.**

2. **Reboot the machine and start the Solaris 10 OS.**

3. **Log in as root (superuser).**

4. **Type the following command to determine if your diagnostic partition has been configured to be mounted:**

   # **ls /diagpart**

   - If this command fails to list the log files created by the hardware diagnostics software then the OS has never been configured to mount the diagnostic partition. Continue to Step 5.

   - If this command succeeds in listing the log files created by the hardware diagnostics software, then the OS has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You do not need to continue this procedure.

5. **Insert the Tools and Drivers CD into the DVD tray.**

6. **When the CD is mounted, open a terminal window.**

7. **Type the following:**

   # **cd /cdrom/cdrom0/drivers/sx86**

8. **Type the following to install the diagnostic partition:**

   # **./install.sh**

9. **Press the Enter key.**

   The following lines appear if the diagnostic partition is mounted successfully:

   ```
   Mounting Diagnostic Partition
   Installation Successful
   ```

10. **Type the following command to list the contents of the diagnostic partition:**

    # **ls /diagpart**

Accessing the Diagnostic Partition on the Windows Server 2003 Operating System

The Windows Server 2003 operating system (OS) does not allow you to mount a diagnostic partition. There is no way to view or gain access to the diagnostic partition if you are running Windows XP on the server.

The only way to retrieve the contents (log files) on the diagnostic partition is to attach a USB diskette drive to the server and complete the following procedure.

1. **Connect the USB diskette drive to any USB port on the server.**

2. **Insert the Tools and Drivers CD into the DVD tray.**

3. **Reboot the server.**

4. **At the Tools and Drivers CD main menu, type 3 to exit to DOS.**

5. **Type the following at the DOS command prompt:**

    C:> **d:**

6. **Copy the log file to the diskette.**

    For example, to copy a file named noinput.jrl to the diskette, type:

    D:> **copy d:\noinput.jrl a:**

    The journal file is now saved to the diskette in the USB diskette drive.

Show Results Summary

The summary lists the tests that were run and shows the results. Pass, Fail, or N/A is listed for each option.

The following is a complete listing of all options that are available with the Tools and Drivers CD. If your own system does not have all of these options, they might not be listed when the Show Results Summary is displayed.

■ **Processor**

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

■ **Motherboard**

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

■ **Memory, Cache Memory, and Video Memory**

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

■ **Input Device**

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

- **Mouse**

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

- **Video**

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

- **Multimedia**

  This section shows the following tests conducted against the multimedia components: Internal Speaker Test, FM Synthesizer Test, PCM Sample Test, CD/DVD Drive Read Test, CD/DVD Transfer (KB/Sec), CD/DVD Transfer Rating, CD/DVD Drive Seek Test, CD/DVD Seek Time (ms), CD/DVD Test Disk Read, and CD/DVD Tray Test.

- **ATAPI Devices**

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

- **Hard Disk**

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

- **USB**

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

- **Hardware ID**

  The compare test is used to determine the machine ID for the system. This test is not available for the Sun Fire X4150, X4250, and X4450 servers.

Print Results Report

The Print Results Report option enables you to print system diagnostic results.

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

About Pc-Check

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

Exit to DOS

Use the Exit to DOS option to exit Pc-Check and return to the DOS prompt.

CHAPTER **4**

Using SunVTS Diagnostic Software

This chapter contains information about the SunVTS™ diagnostic software tool.

The SunVTS Bootable Diagnostics CD that contains the Sun Validation Test Suite (SunVTS) software might be an orderable option for your server. You can also download SunVTS from:

http://www.sun.com/oem/products/vts/

Note – SunVTS 7.0ps2 is the minimum version supported with the Sun Fire X4150, X4250, and X4450 servers.

Running SunVTS Diagnostic Tests

SunVTS provides a comprehensive diagnostic tool that tests and validates Sun hardware by verifying the connectivity and functionality of most hardware controllers and devices on Sun platforms. SunVTS software can be tailored with modifiable test instances and processor affinity features.

The following tests are supported on x86 platforms:

- CD DVD Test (cddvdtest)
- CPU Test (cputest)
- Cryptographics Test (cryptotest)
- Disk and Diskette Drives Test (disktest)
- Data Translation Look-aside Buffer (dtlbtest)
- Emulex HBA Test (emlxtest)
- Floating Point Unit Test (fputest)

- InfiniBand Host Channel Adapter Test (ibhcatest)
- Level 1 Data Cache Test (l1dcachetest)
- Level 2 SRAM Test (l2sramtest)
- Ethernet Loopback Test (netlbtest)
- Network Hardware Test (nettest)
- Physical Memory Test (pmemtest)
- QLogic Host Bus Adapter Test (qlctest)
- RAM Test (ramtest)
- Serial Port Test (serialtest)
- System Test (systest)
- Tape Drive Test (tapetest)
- Universal Serial Board Test (usbtest)
- Virtual Memory Test (vmemtest)

SunVTS software has a sophisticated graphical user interface (GUI) that provides test configuration and status monitoring. The user interface can be run on one system to display the SunVTS testing of another system on the network. SunVTS software also provides a TTY-mode interface for situations in which running a GUI is not possible.

SunVTS Documentation

For the most up-to-date information on SunVTS software, go to:

http://docs.sun.com/app/docs/prod/test.validate

Make sure to read the most recent product Release Notes before running SunVTS on your server.

Diagnosing Server Problems With the Bootable Diagnostics CD

This Bootable Diagnostics CD is designed so that the server will boot from the CD. This CD boots and starts SunVTS software. Diagnostic tests run and write output to log files that the service technician can use to determine the problem with the server.

Requirements

To use the diagnostics CD you must have a keyboard, mouse, and monitor attached to the server on which you are performing diagnostics, or available through a remote KVM.

Using the Bootable Diagnostics CD

To use the diagnostics CD to perform diagnostics:

1. **With the server powered on, insert the CD into the DVD-ROM drive.**

2. **Reboot the server, and press F2 during the start of the reboot so that you can change the BIOS setting for boot-device priority.**

3. **When the BIOS Main menu appears, navigate to the BIOS Boot menu.**

   Instructions for navigating within the BIOS screens appear on the BIOS screens.

4. **On the BIOS Boot menu screen, select Boot Device Priority.**

   The Boot Device Priority screen appears.

5. **Select the DVD-ROM drive to be the primary boot device.**

6. **Save and exit the BIOS screens.**

7. **Reboot the server.**

   When the server reboots from the CD in the DVD-ROM drive, the Solaris operating system boots and SunVTS software starts and opens its first GUI window.

8. **In the SunVTS GUI, press Enter or click the Start button when you are prompted to start the tests.**

   The test suite runs until it encounters an error or the test is completed.

Note – The CD takes approximately nine minutes to boot.

---

9. **When SunVTS software completes the test, review the log files generated during the test.**

   SunVTS provides access to four different log files:

   - SunVTS test error log contains time-stamped SunVTS test error messages. The log file path name is `/var/opt/SUNWvts/logs/sunvts.err`. This file is not created until a SunVTS test failure occurs.

- SunVTS kernel error log contains time-stamped SunVTS kernel and SunVTS probe errors. SunVTS kernel errors are errors that relate to running SunVTS, and not to testing of devices. The log file path name is `/var/opt/SUNWvts/logs/vtsk.err`. This file is not created until SunVTS reports a SunVTS kernel error.

- SunVTS information log contains informative messages that are generated when you start and stop the SunVTS test sessions. The log file path name is `/var/opt/SUNWvts/logs/sunvts.info`. This file is not created until a SunVTS test session runs.

- Solaris system message log is a log of all the general Solaris OS events logged by `syslogd`. The path name of this log file is `/var/adm/messages`.

a. **Click the Log button.**

   The Log file window appears.

b. **Specify the log file that you want to view by selecting it from the Log file window.**

   The content of the selected log file appears in the window.

c. **With the three lower buttons, you can perform the following actions:**

   - **Print the log file –** A dialog box appears for you to specify your printer options and printer name.

   - **Delete the log file –** The file remains on the display, but it will not be available the next time you try to display it.

   - **Close the Log file window –** The window closes.

Note – **If you want to save the log files**: When you use the Bootable Diagnostics CD, the server boots from the CD. Therefore, the test log files are not on the server's hard disk drive and they will be deleted when you power cycle the server. To save the log files, you must save them to a removable media device or FTP them to another system.

Viewing Event Logs

This appendix contains information about the BIOS event log and the SP system event log.

Use this procedure to view the BIOS event log and the SP system event log.

1. **To turn on main power mode (all components powered on) if necessary, use a ball point pen or other nonconductive stylus to press and release the Power button on the server front panel. See** FIGURE 1-1**.**

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

2. **Enter the BIOS Setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   The BIOS Main menu screen is displayed.

3. **View the BIOS event log.**

   a. **From the BIOS Main Menu screen, select the Server tab.**

   b. **Select View event log.**

4. **If the problem with the server is not evident, continue with** "Using the ILOM Service Processor Web Interface to View System Information" on page 47**.**

Status Indicator LEDs

This appendix contains information about the locations and behavior of the LEDs on the server. It describes the external LEDs that can be viewed on the outside of the server and the internal LEDs that can be viewed only with the main cover removed.

External Status Indicator LEDs

See the following figures and tables for information about the LEDs that are viewable on the outside of the server.

- FIGURE B-1, FIGURE B-2 and FIGURE B-3 show and describe the front panel LEDs.
- FIGURE B-4 and FIGURE B-5 show and describe the back panel LEDs.
- FIGURE B-6 shows and describes the hard drive LEDs.
- FIGURE B-7 and FIGURE B-8 show the locations of the internal DIMM LEDs.
- FIGURE B-9 and FIGURE B-10 show the locations of the internal CPU LEDs.

Front Panel LEDs

Sun Fire X4150 Server Front Panel LEDs
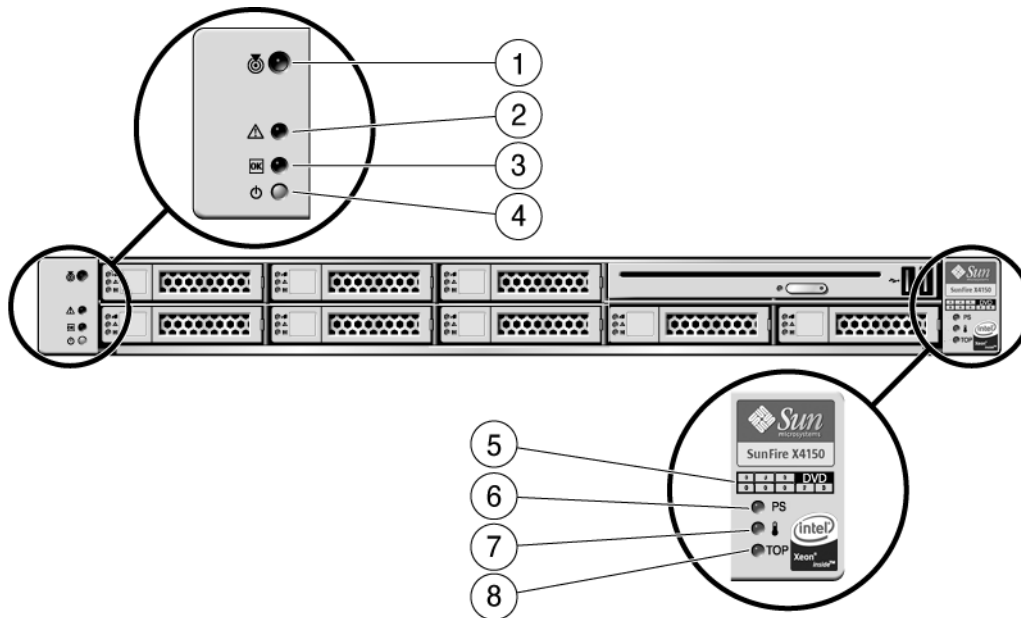
Figure Legend

1	Locator LED/Locator button: (White)	**5**	Hard drive map
2	Service Required LED: (Amber)	**6**	Rear PS LED: (Amber) Power supply fault
3	Power/OK LED: (Green)	**7**	System Over Temperature LED: (Amber)
4	Power button	**8**	Top Fan LED: (Amber) Service action required on fans

FIGURE B-2   Sun Fire X4250 Server Front Panel LEDs
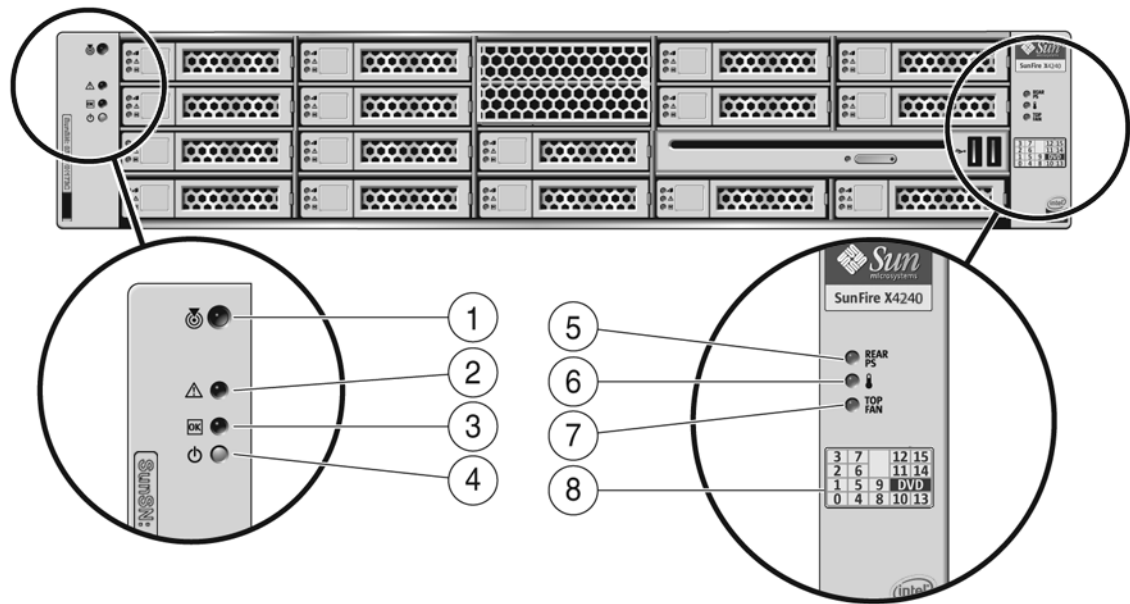
FIGURE B-3   Sun Fire X4450 Server Front Panel LEDs
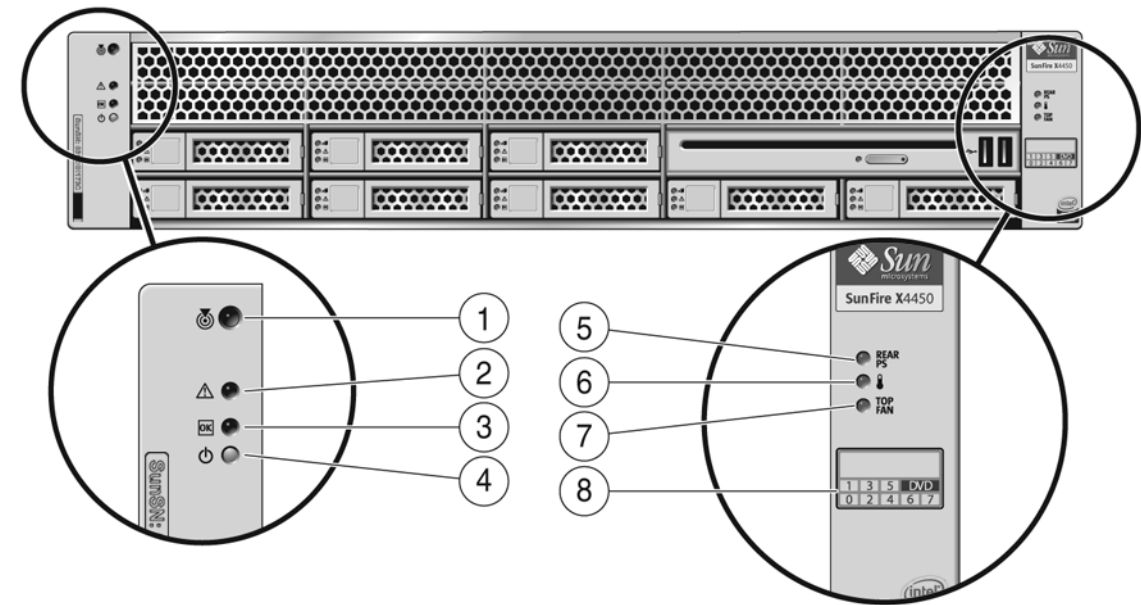
Figure Legend (applies to both X4250 and X4450)

1	Locator LED/Locator button: (White)	**5**	Rear PS LED: (Amber) Power supply fault
2	Service Required LED: (Amber)	**6**	System Over Temperature LED: (Amber)
3	Power/OK LED: (Green)	**7**	Top Fan LED: (Amber) Service action required on fans
4	Power button	**8**	Hard drive map

Back Panel LEDs

FIGURE B-4   Sun Fire X4150 Server Back Panel LEDs
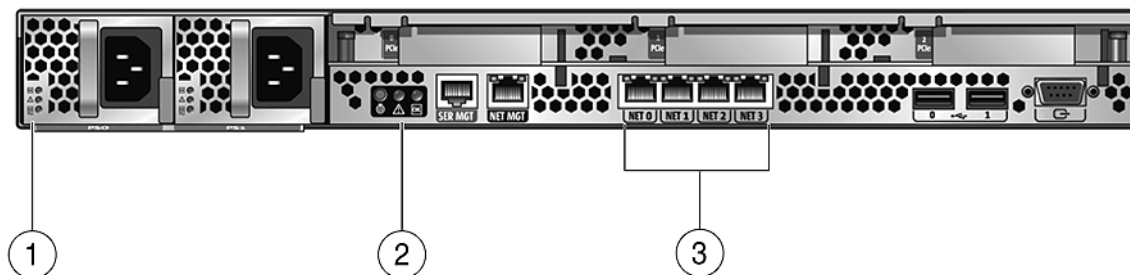
FIGURE B-5   Sun Fire X4250 and X4450 Server Back Panel LEDs

1	Power Supply LEDs:	**3**	Ethernet Port LEDs
	• Power Supply OK: (Green)		**Left side**: Green indicates link activity
	• Power Supply Fail: (Amber)		**Right side**:
	• AC OK: (Green)		• Green: Link is operating at maximum speed
2	System LEDs		• Amber: Link is operating at less than maximum speed.
	• Locator LED Button: (White)		
	• Service Required LED: (Amber)		
	• Power OK LED: (Green)		

Hard Drive LEDs

FIGURE B-6   Hard Drive LEDs

Figure Legend

1	Ready to remove LED: Blue – Service action is allowed
2	Fault LED: Amber – Service action is required
3	Status LED: Green – Blinks when data is being transferred

Internal Status Indicator LEDs

The server has internal status indicators on the motherboard.

■ The DIMM Fault LEDs indicate a problem with the corresponding DIMM. See FIGURE B-7 and FIGURE B-8 for the LED locations.

When you press the Remind button, if there is a problem with a DIMM, the corresponding DIMM Fault LED flashes. See "DIMM Fault LEDs" on page 9 for details.

■ The CPU Fault LEDs indicate a problem with the corresponding CPU. See FIGURE B-9 and FIGURE B-10 for the CPU LED locations.

When you press the Remind button, if there is a problem with a CPU, the corresponding CPU Fault LED flashes.

Note – The DIMM Fault and CPU Fault LEDs operate on stored power for up to a minute when the system is powered down, even after the AC power is disconnected, and the motherboard is out of the system. The stored power lasts for about half an hour.

FIGURE B-7   Remind Button and DIMM LEDs on X4150 and X4250 Motherboard
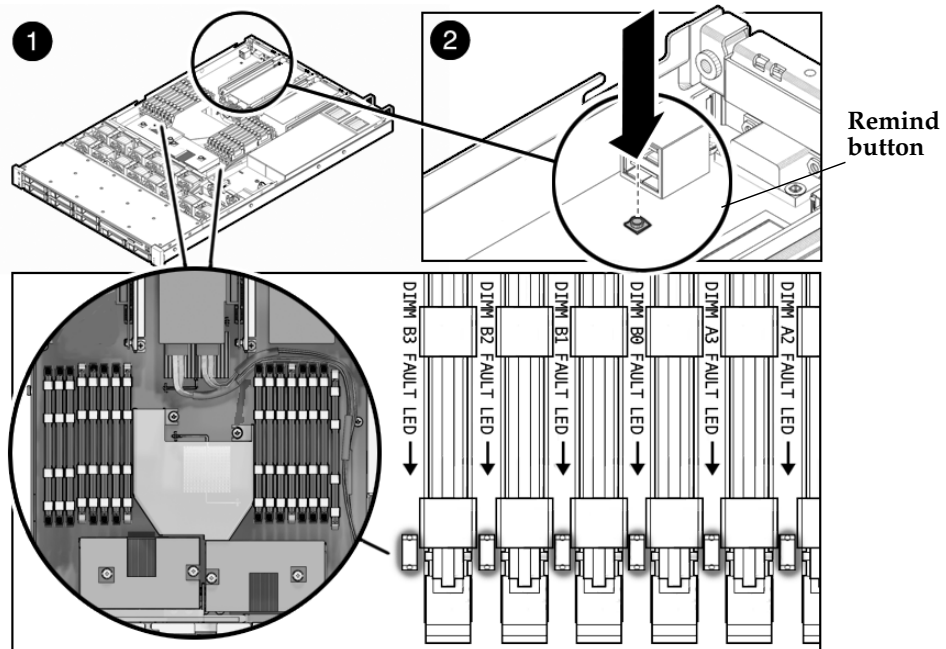
**FIGURE B-8** Remind Button and DIMM LEDs on X4450 Motherboard
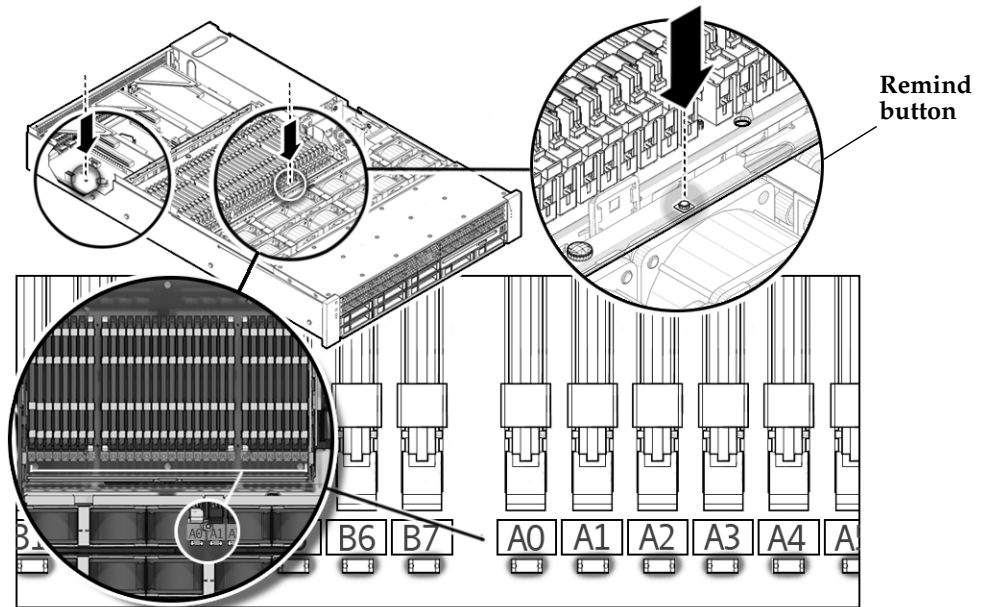
FIGURE B-9 Remind Button and CPU LEDs on X4150 and X4250 Motherboard
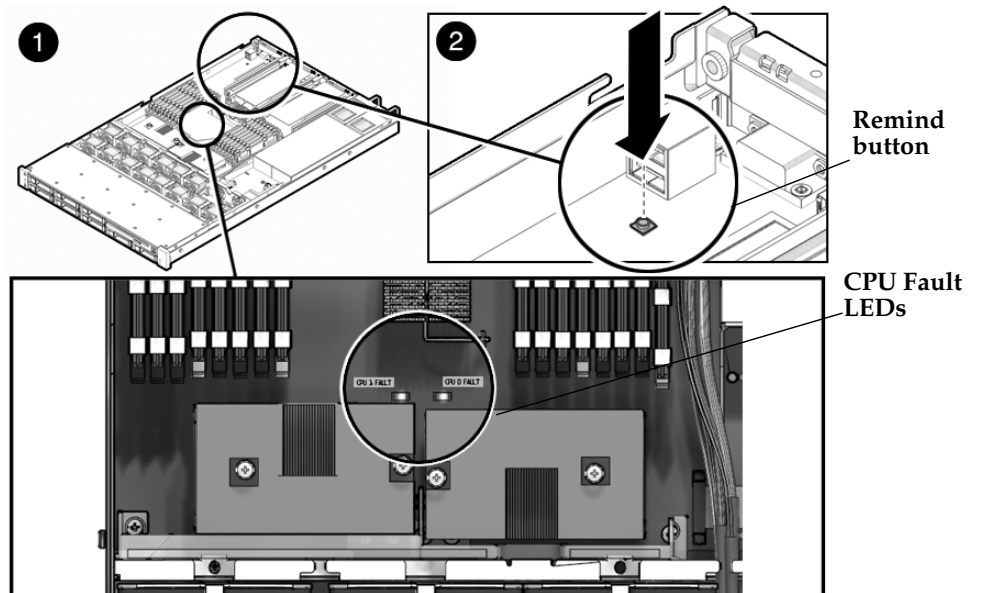
FIGURE B-10 Remind Button and CPU LEDs on X4450 Motherboard

Remind button

CPU Fault LEDs
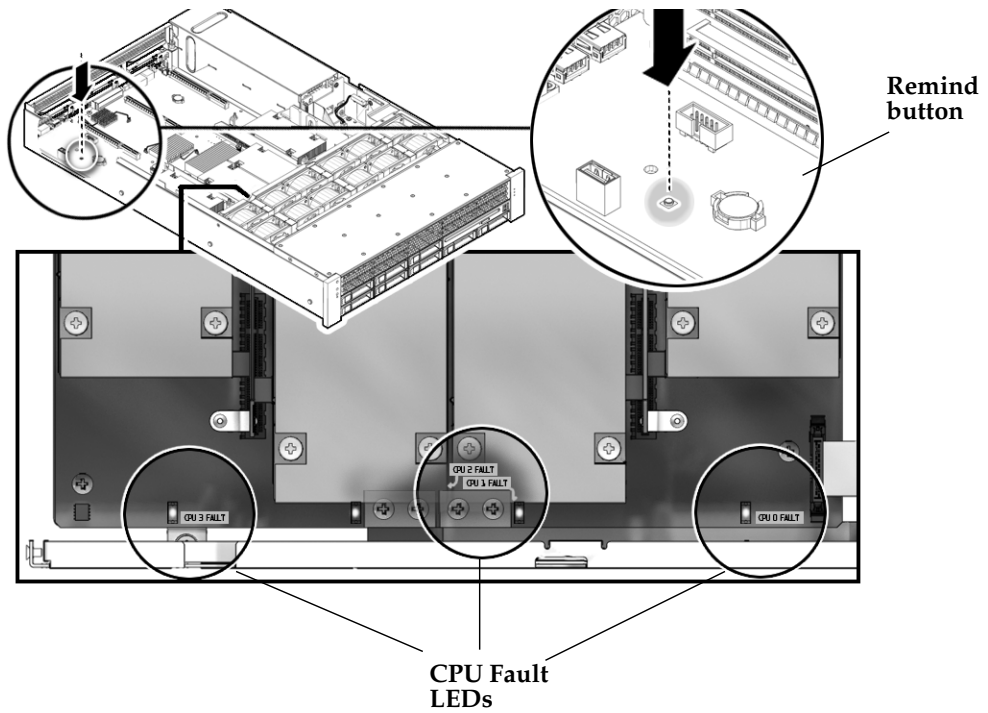
Using the ILOM Service Processor Web Interface to View System Information

This appendix contains information about using the Integrated Lights Out Manager (ILOM) Service processor (SP) web interface to view monitoring and maintenance information for your server.

- "Making a Serial Connection to the SP" on page 48
- "Viewing ILOM SP Event Logs" on page 49
- "Viewing Replaceable Component Information" on page 52
- "Viewing Sensors" on page 54

Note – The information in this chapter might not apply if you have a Sun Blade X4150 or X4450 server that is still running Embedded Lights Out Manager.

For more information on using the ILOM SP web interface to maintain the server (for example, configuring alerts), refer to the *Integrated Lights Out Manager 2.0 User's Guide*.

- If any of the logs or information screens indicate a DIMM error, see Chapter 2.
- If the problem with the server is not evident after viewing ILOM SP logs and information, continue with "Using Pc-Check Diagnostics Software" on page 13 or "Running SunVTS Diagnostic Tests" on page 9.

Making a Serial Connection to the SP

To make a serial connection to the SP:

1. **Connect a serial cable from the RJ-45 Serial Management port on server to a terminal device.**

2. **Press Enter on the terminal device to establish a connection between that terminal device and the ILOM SP.**

Note – If you are connecting to the serial port on the SP during its power-up sequence, you will see boot messages.

The service processor eventually displays a login prompt. For example:

```
SUNSP0003BA84D777 login:
```

The first string in the prompt is the default host name for the ILOM SP. It consists of the prefix SUNSP and the MAC address of the ILOM SP. The MAC address for each ILOM SP is unique.

3. **Log in to the SP and type the default user name, `root`, with the default password, `changeme`.**

   Once you have successfully logged in to the SP, it displays its default command prompt.

   ```
   ->
   ```

4. **To start the serial console, type the following commands:**

   ```
   cd /SP/console
   start
   ```

   To exit console mode and return to the service processor, type Esc+Shift 9 .

5. **Continue with the following procedures:**
   - "Viewing ILOM SP Event Logs" on page 49
   - "Viewing Replaceable Component Information" on page 52
   - "Viewing Sensors" on page 54

Viewing ILOM SP Event Logs

Events are notifications that occur in response to some actions. The IPMI system event log (SEL) provides status information about the server's hardware and software to the ILOM software, which displays the events in the ILOM web interface. To view event logs:

1. **Log in to the SP as administrator or operator to reach the ILOM web interface:**

   a. **Type the IP address of the server's SP into your web browser.**

      The Sun Integrated Lights Out Manager Login screen appears.

   b. **Type your user name and password.**

      When you first try to access the ILOM SP, you are prompted to type the default user name and password. The default user name and password are:

      Default user name: **root**
      Default password: **changeme**

2. **From the System Monitoring tab, select Event Logs.**

   The System Event Logs page is displayed. See FIGURE C-1 for a page that shows sample information.

FIGURE C-1 System Event Logs Page
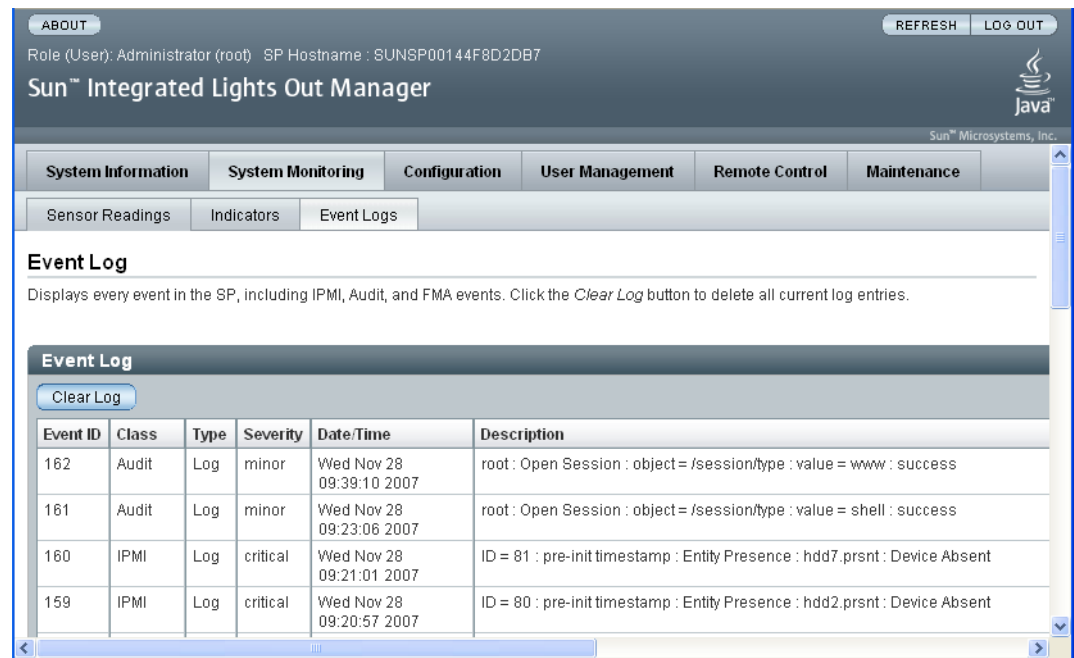
3. **Select the category of event that you want to view in the log from the drop-down list box.**

   You can select from the following types of events:

   - **Sensor-specific events**. These events relate to a specific sensor for a component, for example, a fan sensor or a power supply sensor.

   - **BIOS-generated events**. These events relate to error messages generated in the BIOS.

   - **System management software events**. These events relate to events that occur within the ILOM software.

After you have selected a category of event, the Event Log table is updated with the specified events. The fields in the Event Log are described in TABLE C-1.

TABLE C-1   Event Log Fields

Field	Description
Event ID	The number of the event, in sequence from number 1.
Time Stamp	The day and time the event occurred. If the Network Time Protocol (NTP) server is enabled to set the SP time, the SP clock will use Universal Coordinated Time (UTC). For more information about time stamps, see "Interpreting Event Log Time Stamps" on page 51.
Sensor Name	The name of a component for which an event was recorded. The sensor name abbreviations correspond to these components: • sys: System or chassis • p0: Processor 0 • p1: Processor 1 • io: I/O board • ps: Power supply • fp: Front panel • ft: Fan tray • mb: Motherboard
Sensor Type	The type of sensor for the specified event.
Description	A description of the event.

4. **To clear the event log, click the Clear Event Log button.**

   A confirmation dialog box appears.

5. **Click OK to clear all entries in the log.**

6. **If the problem with the server is not evident after viewing ILOM SP logs and information, continue with** "Running SunVTS Diagnostic Tests" on page 9**.**

Interpreting Event Log Time Stamps

The system event log time stamps are related to the service processor clock settings. If the clock settings change, the change is reflected in the time stamps.

When the service processor reboots, the SP clock is set to Thu Jan 1 00:00:00 UTC 1970. The SP reboots as a result of the following:

- A complete system power cycle
- An IPMI command, for example, `mc reset cold`
- A command-line interface (CLI) command, for example, `reset /SP`

- ILOM web interface operation; for example, from the Maintenance tab, selecting Reset SP
- An SP firmware upgrade

After an SP reboot, the SP clock is changed by the following events:

- When the host is booted. The host's BIOS unconditionally sets the SP time to that indicated by the host's RTC. The host's RTC is set by the following operations:
  - When the host's CMOS is cleared as a result of changing the host's RTC battery or inserting the CMOS-clear jumper on the motherboard. The host's RTC starts at Jan 1 00:01:00 2002.
  - When the host's operating system sets the host's RTC. The BIOS does not consider time zones. Solaris and Linux software respect time zones and will set the system clock to UTC. Therefore, after the OS adjusts the RTC, the time set by the BIOS will be UTC.
  - When the user sets the RTC using the host BIOS Setup screen.
- Continuously via NTP if NTP is enabled on the SP. NTP jumping is enabled to recover quickly from an erroneous update from the BIOS or user. NTP servers provide UTC time. Therefore, if NTP is enabled on the SP, the SP clock will be in UTC.
- Manually, using the CLI, ILOM web interface, and IPMI

Viewing Replaceable Component Information

Depending on the component you select, information about the manufacturer, component name, serial number, and part number can be displayed. To view replaceable component information:

1. **Log in to the SP as administrator or operator to reach the ILOM web interface:**

   a. **Type the IP address of the server's SP into your web browser.**

   The Sun Integrated Lights Out Manager login screen appears.

   b. **Type your user name and password.**

   When you first try to access the ILOM SP, you are prompted to type the default user name and password. The default user name and password are:

   Default user name: **root**
   Default password: **changeme**

2. **From the System Information tab, select Components.**

   The Replaceable Component Information page appears. See FIGURE C-2.

FIGURE C-2   Replaceable Component Information Page

3. **Select a component from the drop-down list.**

   Information about the selected component appears.

4. **If the problem with the server is not evident after viewing replaceable component information, continue with** "Using Pc-Check Diagnostics Software" on page 13 **or** "Using SunVTS Diagnostic Software" on page 9**.**

Viewing Sensors

This section describes how to view the server temperature, voltage, and fan sensor readings.

For a complete list of sensors, see the Integrated Lights Out Manager Supplement for the server.

To view sensor readings:

1. **Log in to the SP as administrator or operator to reach the ILOM web interface:**

   a. **Type the IP address of the server's SP into your web browser.**

      The Sun Integrated Lights Out Manager Login screen appears.

   b. **Type your user name and password.**

      When you first try to access the ILOM Service Processor, you are prompted to type the default user name and password. The default user name and password are:

      Default user name: `root`
      Default password: `changeme`

2. **From the System Monitoring tab, select Sensor Readings.**

   The Sensor Readings page appears. See FIGURE C-3.

FIGURE C-3   Sensor Readings Page
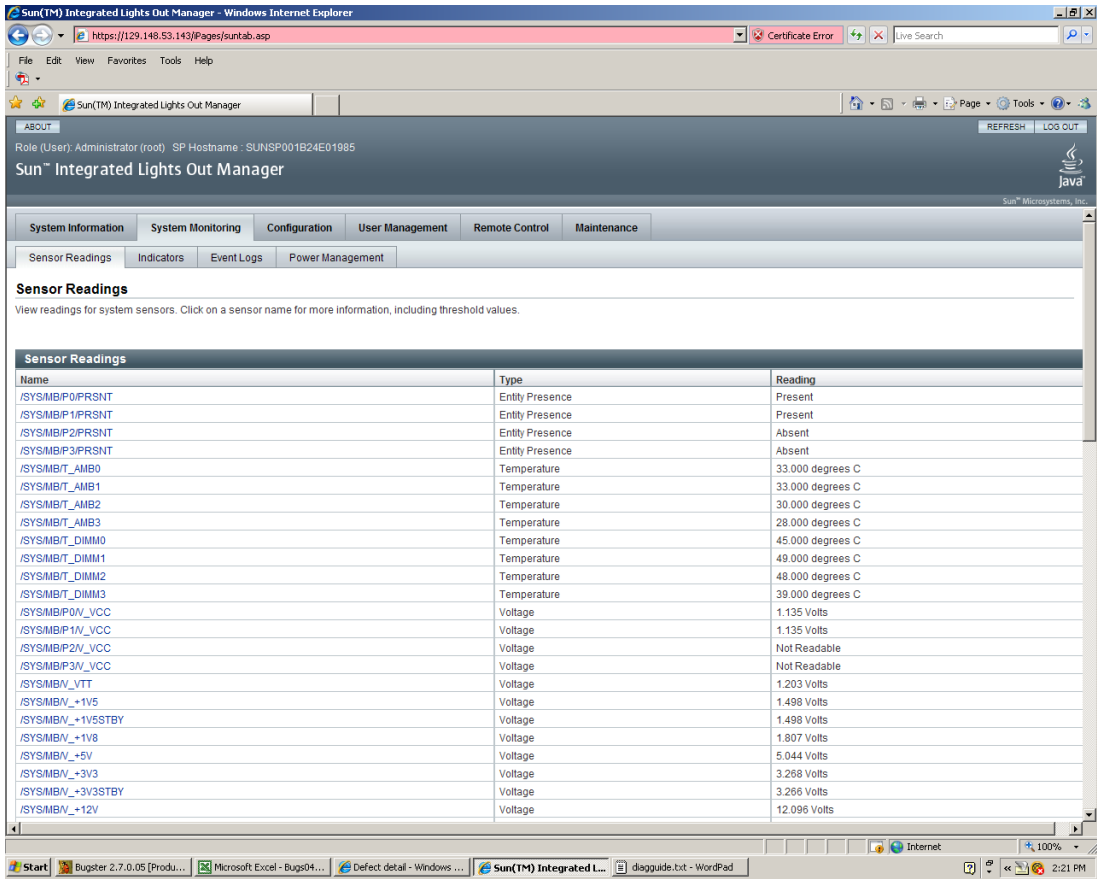
TABLE C-2   Sensor Readings Fields

Field	Description
Status	Reports the status of the sensor, including State Asserted, State Deasserted, Predictive Failure, Device Inserted/Device Present, Device Removed/Device Absent, Unknown, and Normal.
Name	Reports the name of the sensor. The names correspond to the following components: • sys: System or chassis • bp: Back panel • fp: Front panel • mb: Motherboard • io: I/O board • p0: Processor 0 • p1: Processor 1 • ft0: Fan tray 0 • ft1: Fan tray 1 • pdb: Power distribution board • ps0: Power supply 0 • ps1: Power supply 1
Reading	Reports the rpm, temperature, and voltage measurements.

3. **Click the Refresh button to update the sensor readings to their current status.**

4. **Click a sensor to display its thresholds.**

   A display of properties and values appears. See the example in FIGURE C-4.

FIGURE C-4 Sensor Details Page
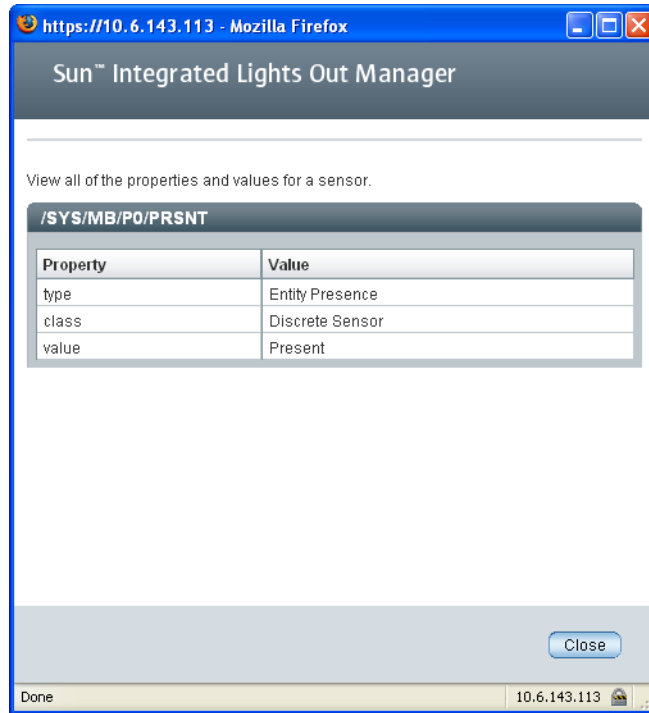
5. **If the problem with the server is not evident after viewing sensor readings information, continue with** "Running SunVTS Diagnostic Tests" on page 9**.**

Booting the Tools and Drivers CD from a PXE Server

This chapter contains information on booting the Tools and Driver CD from a PXE server. It contains information on the following topics:

If you have a server that does not have a DVD drive, you can run the Pc-Check diagnostics and flash the BIOS from a Preboot Execution Environment (PXE) server.

The following topics are included in this section:

- "Setting up the Tools and Drivers CD Image on the PXE Server" on page 59
- "Accessing the Tools and Drivers CD From the Target Server" on page 62

Setting up the Tools and Drivers CD Image on the PXE Server

You will need the following to set up the PXE server:

- Red Hat kickstart server with a CD or DVD drive

  Instructions for setting up the Red Hat kickstart server can be found in the system administration guides for Red Hat Enterprise Linux:

  - Red Hat Enterprise Linux 3 manual at:

    http://www.redhat.com/docs/manuals/enterprise/
    RHEL-3-Manual/sysadmin-guide/

  - Red Hat Enterprise Linux 4 manual at:

    http://www.redhat.com/docs/manuals/enterprise/
    RHEL-4-Manual/sysadmin-guide/

- Tools and Drivers CD

- MEMDISK kernel from the SYSLINUX project. Access this kernel at:
  http://www.kernel.org/pub/linux/utils/boot/syslinux/

To set up the PXE server:

1. **Log in to the PXE server as root (superuser).**

2. **Determine the directory where the Red Hat image is installed on the PXE server.**

   The default directory for the PXE image is usually `/tftpboot/linux-install`. The remainder of this procedure assumes that the PXE files have been installed in this directory.

Note – If your PXE files are not installed in the `/tftpboot/linux-install` directory, modify the procedure as necessary.

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3. **Make a directory for the Tools and Drivers CD contents.**

   ```
   # mkdir /tftpboot/linux-install/suppl_tau
   ```

4. **Insert the Tools and Drivers CD into the PXE server, and copy the** `boot.img` **file located in the root directory of the CD to the new server supplemental directory created in Step 3.:**

   ```
   # cp /mnt/cdrom/boot.img /tftpboot/linux-install/suppl_tau
   ```

5. **Download the MEMDISK kernel.**

   a. **Go to the latest SYSLINUX project web site at:**

   http://www.kernel.org/pub/linux/utils/boot/syslinux/

   b. **Save the latest syslinux-**_version_**.zip file to your root directory.**

   Where _version_ is the latest SYSLINUX project version.

Note – Version 3.63 was the latest version at the time of this writing.

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6. **Unzip the zip file.**

   For example:

   ```
   # unzip syslinux-3.63.zip
   ```

7. **Change to the** `memdisk` **directory.**

   For example:

   ```
   # cd /syslinux-3.63/memdisk
   ```

8. **Copy the memdisk kernel to the new Tools and Drivers Directory created in Step 3.**

   For example:

   ```
   # cp /syslinux-3.63/memdisk/memdisk /tftpboot/linux-install/suppl_tau
   ```

9. **Edit the Boot Message Screen as follows:**

   a. **Open the** `boot.msg` **file in a text editor.**

   ```
   # vi /tftpboot/linux-install/msgs/boot.msg
   ```

   b. **Type the following line after** `0 -Local Machine`.

   ```
   suppl_tau - Sun Fire xxx Server Tools and Drivers CD
   ```

      Where *xxx* is the server number, ie X4250.

   c. **Save and close the** `boot.msg` **file.**

10. **Edit the default PXE Configuration file as follows.**

    a. **Open the** `default` **file in a text editor:**

    ```
    # vi /tftpboot/linux-install/pxelinux.cfg/default
    ```

    b. **Type the following lines after the** `label0` **section:**

    ```
    label suppl_tau
    kernel suppl_tau/memdisk
    append initrd=suppl_tau/boot.img
    ```

    c. **Save and close the** `default` **file.**

11. **Test the installation on the test machine.**

Accessing the Tools and Drivers CD From the Target Server

You will need the following to run diagnostics on a target Sun Fire server:

- PXE server configured as shown in "Setting up the Tools and Drivers CD Image on the PXE Server" on page 59.
- Sun Fire server set up on the same network as the PXE server.

1. **Connect the Sun Fire server to the same network as the PXE server.**

2. **Power on (or reboot) the Sun Fire server.**

3. **Press the F12 key during POST.**

4. **The Boot Message Screen located on your PXE server at** `/tftpboot/linux-install/msgs/boot.msg` **displays on the screen.**

5. **Type `suppl_tau` at the prompt and press Return.**

   The MEMDISK kernel and the bootable portion of the Tools and Drivers CD are downloaded to the test machine over the network and into memory.

   Once downloaded, the bootable portion of the Tools and Drivers CD will be booted.

6. **The main menu of the bootable portion of the Tools and Drivers CD is displayed on the target Sun Fire server.**

7. **You can now run the hardware diagnostics or update the System BIOS.**

   See Chapter 3 in this document for information on running Pc-Check diagnostics software.

Index