Sun™ Integrated Lights Out Manager 2.0 Supplement for Sun Fire™ X4140, X4240, and X4440 Servers

Sun Microsystems, Inc.
www.sun.com

Part No. 820-5754-11
May 2009, Revision A

Submit comments about this document by clicking the Feedback[+] link at: http://docs.sun.com

Please
Recycle

Adobe PostScript

Contents

Preface vii

1. Introduction 1

ILOM 2.0 Features Supported 1

2. Firmware Update Procedures 3

Overview 3

ILOM/System BIOS Firmware Update Summary 3

LSI Disk Controller BIOS Update Summary 4

Obtaining the Service Processor's IP Address 4

Identifying Current Firmware Versions 5

Using the CLI Through the Management Ethernet Port 5

Using the CLI Through the Serial Port 6

Using the Web Interface 7

Downloading New Firmware 7

Flashing the ILOM/BIOS Firmware 8

Flashing the Firmware with the ILOM GUI 9

Flashing the Firmware With the ILOM CLI 10

Flashing the Firmware With the Sun xVM Ops Center 10

Flashing the Firmware With the Web GUI 10

Clearing CMOS Settings (Optional) 10
Resetting the Service Processor 11
Downgrading to a Previous ILOM Release 12
Updating Your LSI Firmware 12
JavaRConsole Method With ISO Image 12
Local Method 15
More on Updating the LSI Firmware 15

3. Sensor Definitions 17

System Sensors 17
sys.intsw 17
sys.acpi 18
sys.nmi 18
sys.power.btn 18
sys.reset.btn 18
sys.locate.btn 18
CPU 0 Discrete Sensors 19
p0.prsnt 19
p0.prochot 19
CPU 1 Discrete Sensors 19
p1.prsnt 19
p1.prochot 20
CPU 2 Discrete Sensors (Sun Fire X4440 Only) 20
p2.prsnt 20
p2.prochot 20
CPU 3 Discrete Sensors (Sun Fire X4440 Only) 21
p3.prsnt 21
p3.prochot 21
Power Supply Sensors 22

ps0.prsnt 22
ps0.vinok 22
ps0.pwrok 23
ps1.prsnt 23
ps1.vinok 23
ps1.pwrok 24
Fan Control Temperature Sensors 24
sys.t_amb 24
p0.t_core 25
p1.t_core 25
p2.t_core 25
p3.t_core 26
Other Temperature Sensors 26
mb.t_core 27
mezz.t_core 27
Mainboard Voltage Sensors 27
mb.v_bat 27
mb.v_+3v3stby 27
mb.v_+3v3 27
mb.v_+5v 27
mb.v_+12v 27
mb.v_+1v5 28
mb.v_+1v2ht 28
mb.v_+1.4 28
Mezzanine Voltage Sensors (Sun Fire X4440 Only) 29
mezz.v_+3v3stby 29
mezz.v_+3v3 29
mezz.v_+12v 29

mezz.v_+1v2ht 30
CPU Voltage Sensors 31
pX.v_vddcore 31
pX.v_+1v8 31
pX.v_+0v9 31
pX.v_vddnb 31
Fan Presence Sensors 33
fbX.fmY.prsnt 33
Fan Speed Sensors 34
fbX.fmY.fZ.speed 34
I/O Sensors 34
hddX.prsnt 34
hddX.fail 35
hddX.ok2rm 35

Preface

The *Sun Integrated Lights Out Manager 2.0 Supplement for Sun Fire X4140, X4240, and X4440 Servers* contains information about Integrated Lights Out Manager (ILOM) 2.0 that is specific to the Sun Fire™ X4140, X4240, and X4440 servers.

For a complete discussion of ILOM 2.0 and its capabilities along with user procedures, see the *Sun Integrated Lights Out Manager 2.0 User's Guide*, the *Addendum to the Sun Integrated Lights Out Manager 2.0 User's Guide*, and the *Sun Fire X4140, X4240, and X4440 Servers Product Notes*.

Related Documentation

The document set for the Sun Fire X4140, X4240, and X4440 servers is described in the *Where To Find Sun Fire X4140, X4240, and X4440 servers Server 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 r document collection using the Product category link. Available translations include Simplified Chinese, French, and Japanese.

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

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to http://www.sun.com/hwdocs/feedback.

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

Sun Integrated Lights Out Manager 2.0 Supplement for Sun Fire X4140, X4240, and X4440 Servers, part number 820-5754-11.

CHAPTER 1

Introduction

This supplement provides information about Integrated Lights Out Manager (ILOM) 2.0 that is specific to the Sun Fire™ X4140, X4240, and X4440 servers.

The following topics are covered in this supplement:

- "ILOM 2.0 Features Supported" on page 1
- Chapter 2, Firmware Update Procedures
- Chapter 3, Sensor Definitions

ILOM 2.0 Features Supported

The Sun Fire X4140, X4240, and X4440 servers support the ILOM 2.0 feature set.

CHAPTER 2

Firmware Update Procedures

This chapter explains how to update the Sun Fire X4140, X4240, or X4440 server with firmware that resides in the following locations:

- Server motherboard (system BIOS)
- Server's Service Processor (ILOM)
- On-board LSI disk controller (HBA BIOS)

This chapter contains the following sections:

- "Obtaining the Service Processor's IP Address" on page 4
- "Identifying Current Firmware Versions" on page 5
- "Downloading New Firmware" on page 7
- "Flashing the ILOM/BIOS Firmware" on page 8
- "Resetting the Service Processor" on page 11
- "Downgrading to a Previous ILOM Release" on page 12
- "Updating Your LSI Firmware" on page 12

ILOM/System BIOS Firmware Update Summary

The Integrated Lights Out Manager (ILOM) firmware and the server's system BIOS are always updated together. You update both ILOM and BIOS firmware *even if* one of their versions has not changed since the last software update.

Update the ILOM/BIOS using the following process:

1. Obtain the IP address of the Service Processor.
   See "Obtaining the Service Processor's IP Address" on page 4.
2. Log on to the Service Processor ILOM to check the versions of firmware you have.
   See "Identifying Current Firmware Versions" on page 5.

3. Use the ILOM to download the new versions of firmware.
   See "Downloading New Firmware" on page 7.

4. Use the ILOM (or the Sun xVM Ops Center, (if supported) to install the new firmware.
   See "Flashing the ILOM/BIOS Firmware" on page 8.

5. Reset the Service Processor.
   See "Resetting the Service Processor" on page 11.

Note – For alternate methods to download firmware, refer to the *Sun Installation Assistant for Windows and Linux User's Guide* (820-3557).

LSI Disk Controller BIOS Update Summary

The Sun Fire X4140, X4240, or X4440 server includes an on-board LSI disk controller. The LSI disk controller's firmware should be updated at the same time as the BIOS and ILOM. The LSI firmware can be updated before or after the BIOS and ILOM firmware.

The final section of the chapter explains how to update the LSI disk controller firmware. See "Updating Your LSI Firmware" on page 12.

Obtaining the Service Processor's IP Address

You must use the Service Processor (SP) to update the firmware on your server, and you need an IP address to access the SP.

If you do not already know the Service Processor's IP address, use one of the following methods to locate ILOM SPs and their IP addresses.

1. **DHCP server.** Refer to the ILOM documentation for your ILOM version for instructions on how to determine the IP address of an SP.

2. **Linux and Solaris open-source `nmap` command.** Use the open-source `nmap` command, with a `-p` port option, to scan for port 623, and quickly detect IPMI-enabled devices (such as your server's SP) on a network. For example:

```
nmap -p 623 10.6.154.1/24
Interesting ports on net.address (623 10.6.154.1/24):
PORT    STATE  SERVICE
623/tcp closed unknown
```

Identifying Current Firmware Versions

Choose one of the following procedures to identify the current firmware versions on your Sun Fire X4140, X4240, or X4440 server:

- "Using the CLI Through the Management Ethernet Port" on page 5
- "Using the CLI Through the Serial Port" on page 6
- "Using the Web Interface" on page 7

Using the CLI Through the Management Ethernet Port

To identify current firmware versions using the CLI, through the management ethernet port:

1. **Connect an RJ-45 Ethernet cable to the NET MGT Ethernet port on the .**
2. **Establish an SSH connection by typing the following command:**

   `# ssh -l root` *`sp_ip`*

   where *`sp_ip`* is the IP address of the server's Service Processor.
3. **Type the default password `changeme` when you are prompted:**

   After you have successfully logged in, the SP displays a default command prompt: `->`
4. **Type the `version` command. Text displays similar to the following:**

```
-> version
SP firmware version: 2.0.2.5
SP firmware build number: 35303
SP firmware date: Tue Jul 29 22:53:53 EDT 2008
SP filesystem version: 0.1.16
```

The ILOM (SP) firmware version and build number are listed above. Refer to the server's ILOM documentation for additional information.

Using the CLI Through the Serial Port

To identify current firmware versions using the CLI, through the serial port:

1. **Configure your terminal device or the terminal emulation software running on a laptop or PC to the following settings:**
   - 8N1: eight data bits, no parity, one stop bit
   - 9600 baud
   - Disable hardware flow control (CTS/RTS)
   - Disable software flow control (XON/XOFF)
2. **Connect a serial cable from the RJ-45 SER MGT port on the to your terminal device or PC.**
3. **Press `Enter` on the terminal device to establish a connection between that terminal device and the server's SP.**

   The SP displays a login prompt.

   ```
   SUNSP0003BA84D777 login:
   ```

   For example, `0003BA84D777` is the Ethernet MAC address of the SP. The address is different for each server.
4. **Log in to the ILOM SP and type the default user name (`root`) with the default password (`changeme`).**

   After you have successfully logged in, the SP displays a default command prompt: `->`
5. **Type the version command, which returns output similar to the following:**

```
-> version
SP firmware version: 2.0.2.5
SP firmware build number: 35303
SP firmware date: Tue Jul 29 22:53:53 EDT 2008
SP filesystem version: 0.1.16
```

The ILOM firmware version and build number are listed above.

Using the Web Interface

To identify current firmware versions using the CLI, through the Web interface:

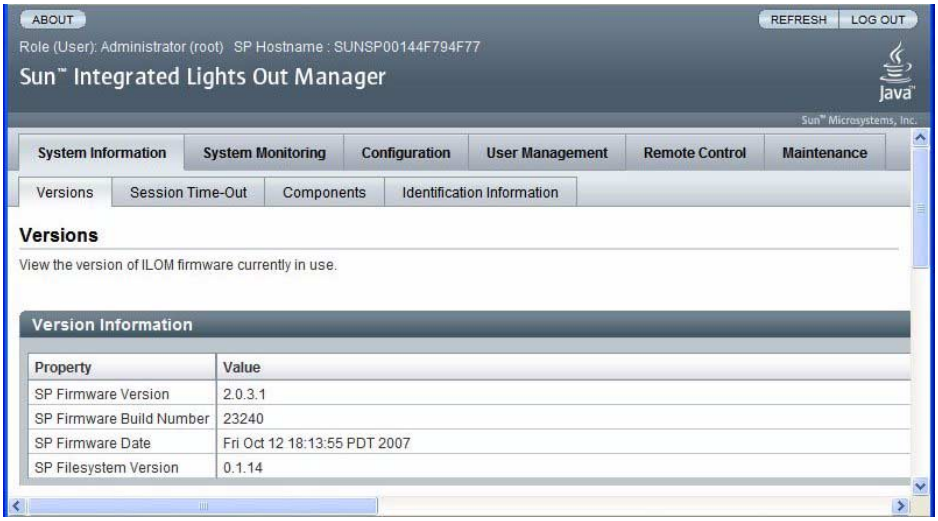
1. **Connect to the ILOM Web interface by typing the IP address of the server's SP in your browser's address field. Use `https://`. For example:**

   `https://129.146.53.150`

2. **Log in to the ILOM SP and type the default user name (`root`) with the default password (`changeme`).**

   The screen shows the `System Information -> Versions` page, which includes the firmware version and build number.

FIGURE 2-1 ILOM Versions Window



Downloading New Firmware

To download the flash image `.pkg` file:

1. **Access the web page `http://www.sun.com/download/` from your browser.**
2. **Locate the Hardware Drivers section.**
3. **Click the X64 Servers and Workstations.**
4. **Click the link for the Sun Fire X4140, X4240, or X4440 server software release version that you want.**
5. **Click Download.**

6. **Enter your Username and Password.**

   If you do not have a Username and Password, you can register free of charge by clicking **Register Now**.

7. **Click Accept License Agreement.**

8. **Click the appropriate firmware image file name:**

   `ilom.`*firmware*`.pkg`

   For example:

   `ilom.X6220-2.0.3.2-r26980.pkg`

Flashing the ILOM/BIOS Firmware

Choose one of the following procedures to flash the ILOM/BIOS firmware on your Sun Fire X4140, X4240, or X4440 server:

- "Flashing the Firmware with the ILOM GUI" on page 9 (Web interface)
- "Flashing the Firmware With the ILOM CLI" on page 10 (`load` command)
- "Flashing the Firmware With the Sun xVM Ops Center" on page 10

Caution – ILOM enters a special mode to load new firmware. No other tasks can be performed in ILOM until the firmware upgrade is complete and the ILOM is reset. To ensure a successful update, do *not* attempt to modify the ILOM configuration, or use other ILOM Web, CLI, SNMP, or IPMI interfaces, during the flash update process. Wait until after the update succeeds before making further ILOM configuration changes. The update requires a system server and takes about 20 minutes.

Note – Due to increased memory use during Web GUI operations, you might find that using the ILOM GUI, which is the easiest procedure, will not work satisfactorily. In such a case, use the ILOM CLI `load` command or the Sun xVM Ops Center to flash the firmware.

Flashing the Firmware with the ILOM GUI

1. **Log into the ILOM GUI by pointing your browser at the IP address of the Service Processor. Use `https://`. For example:**

   `https://10.6.78.144`

2. **Select the Maintenance tab.**

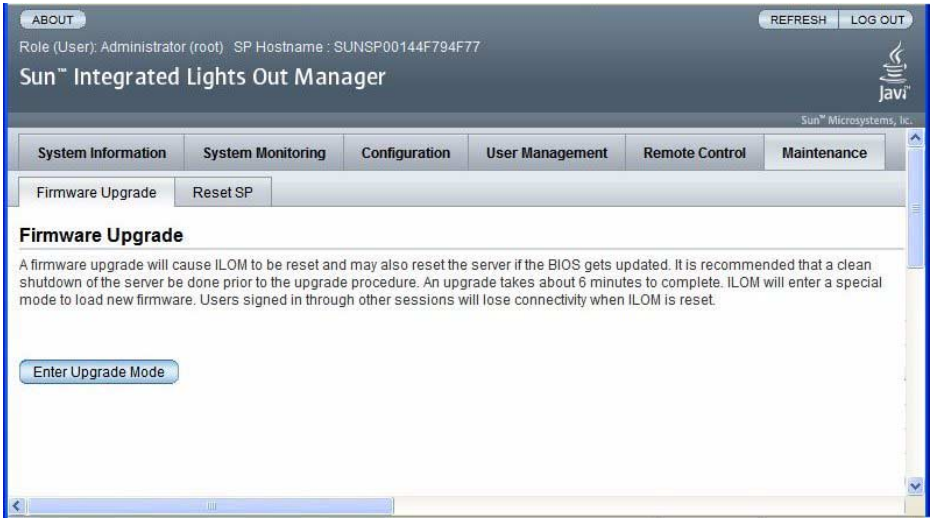
3. **Select the Firmware Upgrade tab.**

4. **Click the Enter Upgrade Mode button.**

5. **Browse for the flash image file.**

6. **Click the Upload button.**

FIGURE 2-2 Firmware Upgrade Screen



Note – Using the Web GUI, you also can specify a local URL for the .pkg file, to let the SP fetch it for itself, instead of browsing and uploading the file.

Flashing the Firmware With the ILOM CLI

1. **Log onto the ILOM CLI through the Management Ethernet Port (see** "Using the CLI Through the Management Ethernet Port" on page 5**) or the serial port (see** "Using the CLI Through the Serial Port" on page 6**).**

2. **From the ILOM CLI, use the following command:**

   `load -source tftp://`*tftpserver*`/ilom.`*firmware*`.pkg`

   where *tftpserver* is the trivial file-transfer protocol (TFTP) server that contains the update and `ilom.`*firmware*`.pkg` is the firmware image file, for example:

   `ilom.X6220-2.0.3.2-r26980.pkg`

Flashing the Firmware With the Sun xVM Ops Center

In Sun xVM Ops Center, the Provisioning feature implements flashing capability.

Online documentation for Sun xVM Ops Center can be found at:

http://wikis.sun.com/display/xvmOC1dot1/Home

Flashing the Firmware With the Web GUI

Using the Web GUI, you also can specify a local URL for the .pkg file, to let the SP fetch it for itself, instead of browsing and uploading the file.

Clearing CMOS Settings (Optional)

If you cannot see output on your serial console after the flash upgrade, you might have to clear CMOS settings. This is because your default CMOS settings might have been changed by the new BIOS upgrade.

To clear CMOS settings, type the following commands (in this example, the default username, `root`, are used). Type the default password, `changeme` when you are prompted:

```
ipmitool -U root -H SP-IP chassis power off
ipmitool -U root -H SP-IP chassis bootdev disk clear-cmos=yes
```

where *SP-IP* is the IP address of the service processor.

Resetting the Service Processor

After flashing the ILOM/BIOS firmware, you must reset the ILOM SP.

To reset the ILOM SP, you can do any of the following:

- From the ILOM SP graphical Web interface, navigate to the Maintenance tab and the Reset SP tab, and then click the Reset SP button.

FIGURE 2-3 ILOM Reset Service Processor Window

- From the ILOM CLI, use the following command:

  ```
  reset /SP
  ```

- Using IPMItool, use the following command:

  ```
  ipmitool -U root -P password -H SP-IP bmc reset cold
  ```

where *SP-IP* is the IP address of the service processor.

- Reset the ILOM SP by shutting down the host, then removing and restoring AC power cords to the system.

For more details, refer to the ILOM documentation for your server.

Downgrading to a Previous ILOM Release

Should you use this update and later find that you need to downgrade to a previous release, you may need perform the flash downgrade twice to reformat the flash layout to the old format. If so, a message will prompt you. This is not a failure. Just repeat the procedure as instructed and the process will succeed.

Updating Your LSI Firmware

Caution – During an update, never power off the system.

To update the LSI firmware, you must boot the server from a special DVD/CD or DVD/CD image. Choose one of the following ways to update the LSI firmware:

- Use JavaRConsole to interact with the server and to mount a DVD/CD or DVD/CD image. This method does not require physical access to the server. See "JavaRConsole Method With ISO Image" on page 12.
- Reboot the system from a DVD/CD inserted into the server's optical drive or an optical drive connected to the server. This methods requires physical access to the system. See "Local Method" on page 15.

JavaRConsole Method With ISO Image

Note – These instructions assume you are logging in to the ILOM GUI from a system running Windows.

1. **Using a web browser, connect to the ILOM and open the ILOM Web interface. Use** `https://`**:**

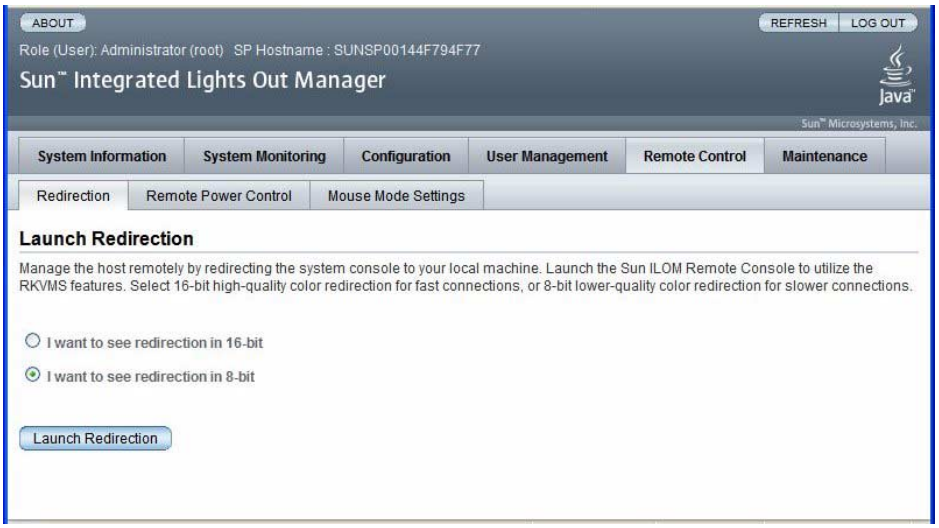
   `https://`*sp_ip_address*

   where *sp_ip_address* is the IP address of the service processor.

2. **Select the Remote Control**

3. **Select the Redirection tab.**

FIGURE 2-4 ILOM Launch Redirection Window



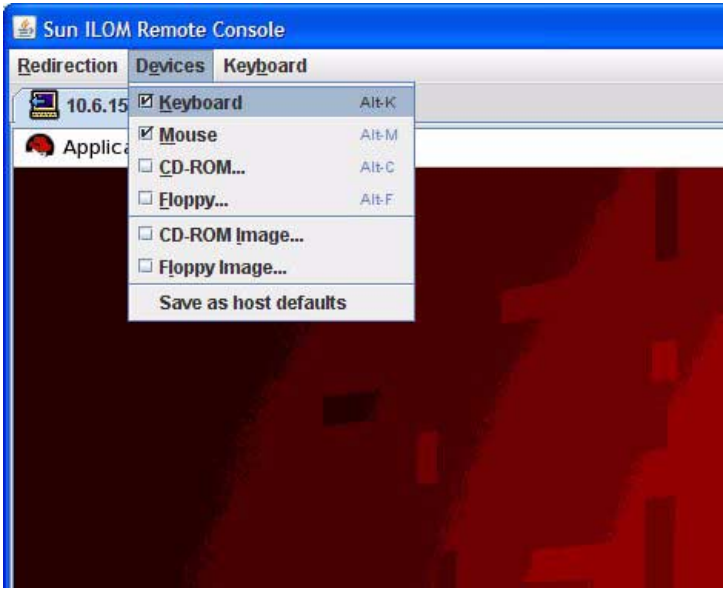
4. **Select 8-bit color.**
5. **Click the Launch Redirection button.**
6. **At the login prompt for the JavaRconsole window, type `root`, and then type the root password (`changeme`).**

Note – Do not attempt to use the mouse in the JavaRconsole window, as you will then need to use the keyboard shortcuts to access the JavaRconsole menus.

---

7. **In the JavaRconsole window, select the Devices menu.**

FIGURE 2-5 JavaConsole Devices Menu



8. **Highlight CD-ROM Image and click Enter.**
9. **In the dialog box that opens, select the location of the LSI firmware update CD-ROM Image (ISO).**

   A check mark is displayed on the drop-down menu selection.
10. **Switch to the ILOM GUI.**
11. **Select the Remote Control tab, then the Remote Power Control tab.**
12. **Select Reset from the Select Action drop-down list box.**
13. **When the system reboots, select "1" (*Perform the Update*) from the JavaRconsole window.**

    The update proceeds. When complete, the console responds with a new prompt.
14. **In the JavaRConsole window select the Devices and highlight the CD-ROM Image menu item. Click Enter to detach the LSI firmware update ISO file.**
15. **Select the JavaRConsole Keyboard menu and choose Control Alt Delete.**
16. **On system boot, you will notice the new LSI firmware version.**

Local Method

1. **Download the LSI firmware ISO file from the Sun Fire X64 servers Web site and burn it to a bootable DVD/CD.**

Note – The bootable CD will appear blank when viewed using the operating system. This is expected behavior.

---

2. **Use the server's CD_ROM drive or a CD-ROM drive connected to the server.**
3. **Insert the bootable CD and reboot the server.**

   The firmware is upgraded.
4. **Reboot the system.**

More on Updating the LSI Firmware

For additional information about the LSI firmware and BIOS, refer to the documentation files that accompany the LSI download.

CHAPTER 3

Sensor Definitions

This chapter lists and describes the Sun Fire X4140, X4240, and X4440 sensors.

Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* for instructions on displaying the sensors.

System Sensors

sys.intsw

This sensor indicates the state of the chassis intrusion switch. When the chassis cover to the CPU area is opened, the system sensor logs an event.

State	Event	Description
General chassis intrusion	Yes	This state indicates that the chassis intrusion switch has been activated.
	No	This state indicates that the intrusion switch is inactive and has not been tripped.

sys.acpi

This sensor indicates the ACPI power state of the system.

State	Event	Description
S0/G0: working	Yes	System power is on (S0).
S5/G2: soft-off	Yes	System power is off (S5).

sys.nmi

This sensor monitors the rear NMI button.

State	Event	Description
NMI/Diag Interrupt	Yes	NMI dump button pressed.

sys.power.btn

This sensor monitors the system Power button.

State	Event	Description
Power button pressed	Yes	Power button pressed.

sys.reset.btn

This sensor monitors the rear Reset button.

State	Event	Description
Reset button pressed	Yes	Reset button pressed.

sys.locate.btn

This sensor monitors the system Locate button.

State	Event	Description
Asserted	Yes	Locate button pressed.

CPU 0 Discrete Sensors

p0.prsnt

This sensor indicates the presence of CPU 0.

State	Event	Description
Predictive Failure Deasserted	Yes	This state indicates CPU 0 is absent.
Predictive Failure Asserted	Yes	This state indicates CPU 0 is present.

p0.prochot

When asserted, this sensor indicates that CPU 0 has reached a preset maximum operating temperature and thermal throttling is active in the processor.

State	Event	Description
Asserted	Yes	This state indicates CPU 0 prochot signal is asserted.
Deasserted	Yes	This state indicates CPU 0 prochot signal is deasserted.

CPU 1 Discrete Sensors

p1.prsnt

This sensor indicates the presence of CPU 1.

State	Event	Description
Predictive Failure Deasserted	Yes	This state indicates CPU 1 is absent.
Predictive Failure Asserted	Yes	This state indicates CPU 1 is present.

p1.prochot

When asserted, this sensor indicates that CPU 1 has reached a preset maximum operating temperature and thermal throttling is active in the processor.

State	Event	Description
Asserted	Yes	This state indicates CPU 1 prochot signal is asserted.
Deasserted	Yes	This state indicates CPU 1 prochot signal is deasserted.

CPU 2 Discrete Sensors (Sun Fire X4440 Only)

p2.prsnt

This sensor indicates the presence of CPU 2.

State	Event	Description
Predictive Failure Deasserted	Yes	This state indicates CPU 2 is absent.
Predictive Failure Asserted	Yes	This state indicates CPU 2 is present.

p2.prochot

When asserted, this sensor indicates that CPU 2 has reached a preset maximum operating temperature and thermal throttling is active in the processor.

State	Event	Description
Asserted	Yes	This state indicates CPU 2 prochot signal is asserted.
Deasserted	Yes	This state indicates CPU 2 prochot signal is deasserted.

CPU 3 Discrete Sensors (Sun Fire X4440 Only)

p3.prsnt

This sensor indicates the presence of CPU 3.

State	Event	Description
Predictive Failure Deasserted	Yes	This state indicates CPU 3 is absent.
Predictive Failure Asserted	Yes	This state indicates CPU 3 is present.

p3.prochot

When asserted, this sensor indicates that CPU 3 has reached a preset maximum operating temperature and thermal throttling is active in the processor.

State	Event	Description
Asserted	Yes	This state indicates CPU 3 prochot signal is asserted.
Deasserted	Yes	This state indicates CPU 3 prochot signal is deasserted.

Power Supply Sensors

ps0.prsnt

This sensor indicates whether power supply 0 is present. On systems with two power supplies, the power supply configuration is redundant, so if power supply 0 is removed, the power supply status LEDs are turned ON.

State	Event	Description
Device Absent	Yes	Power Supply 0 is absent.
Device Present	Yes	Power Supply 0 is present.

When the device is absent, PS Fail is ON and System Alert LED is ON.

ps0.vinok

This sensor indicates whether power supply 0 is connected to AC power.

This sensor is only monitored when PS0 is present.

State	Event	Description
State Deasserted	Yes	Power Supply 0 is disconnected from AC power.
State Asserted	Yes	Power Supply 0 is connected to AC power.

When deasserted, PS Fail is ON and System Alert LED is ON.

ps0.pwrok

This sensor indicates whether power supply 0 is turned on and powering the system.

This sensor is only monitored when PS0 is present and system power is good.

State	Event	Description
State Deasserted	Yes	Power Supply 0 is off.
State Asserted	Yes	Power Supply 0 is on.

When deasserted, PS Fail is ON and System Alert LED is ON.

ps1.prsnt

This sensor indicates whether power supply 1 is present. The power supply configuration is redundant, so if power supply 1 is removed, the power supply status LEDs are turned ON.

State	Event	Description
Device Absent	Yes	Power Supply 1 is absent.
Device Present	Yes	Power Supply 1 is present.

When the device is absent, PS Fail is ON and the System Alert LED is ON.

ps1.vinok

This sensor indicates whether power supply 1 is connected to AC power.

This sensor is only monitored when PS1 is present.

State	Event	Description
State Deasserted	Yes	Power Supply 1 is disconnected from AC power.
State Asserted	Yes	Power Supply 1 is connected to AC power.

When deasserted PS Fail is ON and System Alert LED is ON.

ps1.pwrok

This sensor indicates whether power supply 1 is turned on and powering the system. This sensor is only monitored when PS1 is present and system power is good.

State	Event	Description
State Deasserted	Yes	Power Supply 1 is off.
State Asserted	Yes	Power Supply 1 is on.

When deasserted PS Fail is ON and System Alert LED is ON.

Fan Control Temperature Sensors

Temperature sensors in this category are used as inputs to the fan control algorithm and are also used to turn system power off if they are non-recoverable. Their state also affects the state of the front panel LEDs.

sys.t_amb

This sensor monitors the system ambient temperature from an ADT7462 chip.

Threshold	Direction	Event	Description
Upper Non-Critical	Assert	Yes	Ambient temperature has increased above non-critical threshold. Action: None
Upper Non-Critical	Deassert	Yes	Ambient temperature has returned to normal from non-critical. Action: None
Upper Critical	Assert	Yes	Ambient temperature has increased above critical threshold. Action: Over Temperature LED is ON and System Alert LED is ON.
Upper Critical	Deassert	Yes	Ambient temperature has returned to non-critical from critical.

Threshold	Direction	Event	Description
			Action: Over Temperature LED is OFF and System Alert LED is OFF.
Upper Non-Recoverable	Assert	Yes	Ambient temperature has increased above non-recoverable threshold.
			Action: Over Temperature LED is ON and System Alert LED is ON and System Power is turned OFF.
Upper Non-Recoverable	Deassert	Yes	Ambient temperature has returned to critical from non-recoverable.
			Action: Over Temperature LED is ON and System Alert LED is ON.

p0.t_core

This sensor monitors CPU 0 temperature.

p1.t_core

This sensor monitors CPU 1 temperature.

p2.t_core

This sensor monitors CPU 2 temperature. This sensor is available only on the Sun Fire X4440.

p3.t_core

This sensor monitors CPU 3 temperature. This sensor is available only on the Sun Fire X4440.

For All pX.t_core Sensors			
Threshold	**Direction**	**Event**	**Description**
Upper Non-Critical	Assert	Yes	Ambient temperature has increased above non-critical threshold. Action: None
Upper Non-Critical	Deassert	Yes	Ambient temperature has returned to normal from non-critical. Action: None
Upper Critical	Assert	Yes	Ambient temperature has increased above critical threshold. Action: Over Temperature LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Critical	Deassert	Yes	Ambient temperature has returned to non-critical from critical. Action: Over Temperature LED is OFF, CPU *X* Fail LED is OFF, and System Alert LED is OFF.
Upper Non-Recoverable	Assert	Yes	Ambient temperature has increased above non-recoverable threshold. Action: Over Temperature LED is ON, CPU *X* Fail LED is ON, System Alert LED is ON, and System Power is turned OFF.
Upper Non-Recoverable	Deassert	Yes	Ambient temperature has returned to critical from non-recoverable. Action: Over Temperature LED is ON, CPU *X* Fail LED is OFF, and System Alert LED is ON.

Other Temperature Sensors

These temperature sensors are monitored and will affect the state of the front panel LEDs, but are not used as inputs to the fan control algorithm and are not used to turn off system power when they are non-recoverable.

mb.t_core

This sensor monitors the ambient temperature from the ADM1026 chip on the motherboard.

mezz.t_core

This sensor monitors the ambient temperature from the ADM1026 chip on the mezzanine board.

Mainboard Voltage Sensors

All mainboard voltage sensors are configured to generate the same events and faults are handled in the same way.

mb.v_bat

This sensor monitors the 3V RTC battery on the mainboard.

mb.v_+3v3stby

This sensor monitors the 3.3V standby input that powers the service processor and other standby devices.

mb.v_+3v3

This sensor monitors the 3.3V main input that is active when the power is on.

mb.v_+5v

This sensor monitors the 5V main input that is active when the power is on.

mb.v_+12v

This sensor monitors the 12V main input that is active when the power is on.

mb.v_+1v5

This sensor monitors the 1.5V input that is active when the power is on.

mb.v_+1v2ht

This sensor monitors the 1.2Vht input that is active when the power is on.

mb.v_+1.4

This sensor monitors the 1.4V input that is active when the power is on.

Threshold	Direction	Event	Description
Lower Non-Critical	Assert	Yes	Voltage has decreased below lower non-critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Critical	Deassert	Yes	Voltage has returned to normal from lower non-critical.
			Action: PS Fail LED is OFF and System Alert LED is OFF.
Lower Critical	Assert	Yes	Voltage has decreased below lower critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Critical	Deassert	Yes	Voltage has returned to lower non-critical from lower critical.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Recoverable	Assert	Yes	Voltage has decreased below lower non-recoverable threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Recoverable	Deassert	Yes	Voltage has returned to lower critical from lower non-recoverable.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Critical	Assert	Yes	Voltage has increased above upper non-critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Critical	Deassert	Yes	Voltage has returned to normal from upper non-critical.
			Action: PS Fail LED is OFF and System Alert LED is OFF.

Threshold	Direction	Event	Description
Upper Critical	Assert	Yes	Voltage has increased above upper critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Critical	Deassert	Yes	Voltage has returned to upper non-critical from upper critical.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Recoverable	Assert	Yes	Voltage has increased above upper non-recoverable threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Recoverable	Deassert	Yes	Voltage has returned to upper critical from upper non-recoverable.
			Action: PS Fail LED is ON and System Alert LED is ON.

Mezzanine Voltage Sensors (Sun Fire X4440 Only)

All mezzanine voltage sensors are configured to generate the same events, and faults are handled in the same way.

mezz.v_+3v3stby

This sensor monitors the mezzanine board 3.3V standby input.

mezz.v_+3v3

This sensor monitors the mezzanine board 3.3V main input that is active when the power is on.

mezz.v_+12v

This sensor monitors the mezzanine board 12V main input that is active when the power is on.

mezz.v_+1v2ht

This sensor monitors the mezzanine board 1.2Vht input that is active when the power is on.

Thresholds for All Mezzanine Voltage Sensors

Threshold	Direction	Event	Description
Lower Non-Critical	Assert	Yes	Voltage has decreased below lower non-critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Critical	Deassert	Yes	Voltage has returned to normal from lower non-critical.
			Action: PS Fail LED is OFF and System Alert LED is OFF.
Lower Critical	Assert	Yes	Voltage has decreased below lower critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Critical	Deassert	Yes	Voltage has returned to lower non-critical from lower critical.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Recoverable	Assert	Yes	Voltage has decreased below lower non-recoverable threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Lower Non-Recoverable	Deassert	Yes	Voltage has returned to lower critical from lower non-recoverable.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Critical	Assert	Yes	Voltage has increased above upper non-critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Critical	Deassert	Yes	Voltage has returned to normal from upper non-critical.
			Action: PS Fail LED is OFF and System Alert LED is OFF.
Upper Critical	Assert	Yes	Voltage has increased above upper critical threshold.
			Action: PS Fail LED is ON and System Alert LED is ON.
Upper Critical	Deassert	Yes	Voltage has returned to upper non-critical from upper critical.
			Action: PS Fail LED is ON and System Alert LED is ON.

Thresholds for All Mezzanine Voltage Sensors			
Threshold	**Direction**	**Event**	**Description**
Upper Non-Recoverable	Assert	Yes	Voltage has increased above upper non-recoverable threshold. Action: PS Fail LED is ON and System Alert LED is ON.
Upper Non-Recoverable	Deassert	Yes	Voltage has returned to upper critical from upper non-recoverable. Action: PS Fail LED is ON and System Alert LED is ON.

CPU Voltage Sensors

All CPU voltage sensors are configured to generate the same events, and faults are handled in the same way.

X is 0-3 on Sun Fire X4440 and 0-1 on the Sun Fire X4140 and X4240.

p*X*.v_vddcore

This sensor monitors the CPU *X* VDD voltage.

p*X*.v_+1v8

This sensor monitors the CPU *X* 1.8V voltage.

p*X*.v_+0v9

This sensor monitors the CPU *X* 0.9V voltage.

p*X*.v_vddnb

This sensor monitors the North Bridge voltage.

Thresholds for all CPU Voltage Sensors			
Threshold	**Direction**	**Event**	**Description**
Lower Non-Critical	Assert	Yes	CPU *X* voltage has decreased below lower non-critical threshold. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Lower Non-Critical	Deassert	Yes	CPU *X* voltage has returned to normal from lower non-critical. Action: PS Fail LED is OFF, CPU *X* Fail LED is OFF, and System Alert LED is OFF.
Lower Critical	Assert	Yes	CPU *X* voltage has decreased below lower critical threshold. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Lower Critical	Deassert	Yes	CPU *X* voltage has returned to lower non-critical from lower critical. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Lower Non-Recoverable	Assert	Yes	CPU *X* voltage has decreased below lower non-recoverable threshold. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Lower Non-Recoverable	Deassert	Yes	CPU *X* voltage has returned to lower critical from lower non-recoverable. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Non-Critical	Assert	Yes	CPU *X* voltage has increased above upper non-critical threshold. Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Non-Critical	Deassert	Yes	CPU *X* voltage has returned to normal from upper non-critical. Action: PS Fail LED is OFF, CPU *X* Fail LED is OFF, and System Alert LED is OFF.
Upper Critical	Assert	Yes	CPU *X* voltage has increased above upper critical threshold.

Thresholds for all CPU Voltage Sensors			
Threshold	**Direction**	**Event**	**Description**
			Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Critical	Deassert	Yes	CPU *X* voltage has returned to upper non-critical from upper critical.
			Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Non-Recoverable	Assert	Yes	CPU *X* voltage has increased above upper non-recoverable threshold.
			Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.
Upper Non-Recoverable	Deassert	Yes	CPU *X* voltage has returned to upper critical from upper non-recoverable.
			Action: PS Fail LED is ON, CPU *X* Fail LED is ON, and System Alert LED is ON.

Fan Presence Sensors

The chassis has individual fan module presence sensors that indicate the physical presence of the fan module.

fb*X*.fm*Y*.prsnt

This sensor indicates the presence of Fan Module *Y*, on Fan Board *X*.

State	**Event**	**Description**
Device Absent	Yes	This state indicates that Fan Board *X* Module *Y* is absent.
Device Present	Yes	This state indicates that Fan Board *X* Module *Y* is present.

Fan Speed Sensors

All fan board fan speed sensors are configured to generate the same events and all faults are handled in the same way.

fb*X*.fm*Y*.f*Z*.speed

This sensor monitors the speed of the Fan *Z* in Fan Module *Y*, on Fan Board *X*.

Threshold	Direction	Event	Description
Lower Non-Recoverable	Assert	Yes	Fan speed has decreased below lower non-recoverable threshold. Action: Fan Fail LED is ON, Fan Board *X* Module Y Fail LED is ON, and System Alert LED is ON.
Lower Non-Recoverable	Deassert	Yes	Fan speed has returned to normal from lower non-recoverable. Action: Fan Fail LED is OFF, Fan Board *X* Module Y Fail LED is OFF, and System Alert LED is OFF.

I/O Sensors

hdd*X*.prsnt

This sensor monitors hard drive presence.

- *X* is 0-7 for the Sun Fire X4140 and X4440.
- *X* is 0-15 for the Sun Fire X4240.

State	Event	Description
Device Absent	Yes	This state indicates that HDD *X* is not present.
Device Present	Yes	This state indicates that HDD *X* is present.

hdd*X*.fail

This sensor monitors hard drive failure.

- *X* is 0-7 for the Sun Fire X4140 and X4440.
- *X* is 0-15 for the Sun Fire X4240.

State	Event	Description
Predictive Failure Deasserted	No	This state indicates HDD *X* Fault.
Predictive Failure Asserted	Yes	This state indicates HDD *X* Fault.

This sensor is asserted in response to a fault signal from the AMI SAS controller. The amber LED on drive *X* and the System Alert LED are ON while this is asserted.

hdd*X*.ok2rm

This settable discrete sensor shows the "OK to remove" status of the drive.

- *X* is 0-7 for the Sun Fire X4140 and X4440.
- *X* is 0-15 for the Sun Fire X4240.

Reading	Event	Description
0x80 (States Asserted: [Hot Spare])	Yes	It is OK to remove HDD *X*.
0x00	No	It is not OK to remove HDD *X*.

This sensor reading is set by external entities such as a disk monitor application running on the host OS. As a result, the blue LED on drive *X* is ON when the "Hot Spare" state is asserted.