Sun Fire™ X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement

Sun Microsystems, Inc.
www.sun.com

Part No. 819-4361-14
September 2009, Revision A

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

Please
Recycle

Adobe PostScript

Contents

CHAPTER 1

ILOM Supplement for the Sun Fire X4500/X4540 Servers

This supplement contains information for using Integrated Lights Out Manager (ILOM) with the Sun Fire™ X4500/X4540 servers.

ILOM documentation is divided into two categories:

- Generalized ILOM information, located in one of the ILOM User's guides:
  - *Sun Integrated Lights Out Manager 2.0 User's Guide*
  - *Integrated Lights Out Manager (ILOM) Administration Guide for ILOM 1.1.1*
  - *Integrated Lights Out Manager (ILOM) Administration Guide for ILOM 1.0*

  Please refer to the corresponding guide for information about the your ILOM.
- Information specific to the Sun Fire X4500/X4540 Server, located in this supplement.

This document provides information about the following topics:

Related Documentation

For a description of the document set for the Sun Fire X4500/X4540 server, see the Where To Find Documentation sheet that is packed with your system and also posted at the product documentation site. See the following URL, and then navigate to your product.

http://docs.sun.com

Translated versions of some of the Sun Fire X4500/X4540 Server documents are available at the web sites listed in the Where To Find Documentation sheet.

Note – The English documentation is revised more frequently and might therefore be more up-to-date than the translated documentation.

Sun Fire X4500 ILOM 2.0.2.5 r47053 Update

The Sun Fire X4500 ILOM 2.0.2.5, r47053 update has included the Console history log feature—this functionality connects to the system console and outputs the Console history log onto the SP. That log file can be dumped upon request using an SP command `show /SP/console/history`.

Console history has the following properties:

```
-> ls

 /SP/console
    Targets:
        history

    Properties:
        line_count = 25
        pause_count = 15
        start_from = end
```

- `line_count`—Specifies how many lines of console log will be shown.
- `pause_count`—Specifies how many lines of console log will be shown before SP stops to show and waits for user input to continue.

- `start_from`—It can be configured with `end` or `beginning`.
  - `end`—Latest `line_count` lines of console log will be shown.
  - `beginning`—Oldest `line_count` lines of console log will be shown.

Sensors for Sun Fire X4500 Server

Note – For the Sun Fire X4540 server sensors, see "Sensors For Sun Fire X4540 Servers" on page 37.

The Sun Fire X4500 server includes a number of sensors that generate entries in the system event log (SEL) when the sensor crosses a threshold. Many of these readings are used to adjust the fan speeds and perform other actions, such as illuminating LEDs and powering off the chassis.

These sensors can also be configured to generate IPMI PET traps as described in the corresponding ILOM user's guide.

This section describes the sensors and provides details about their operation.

Caution – Do not use any interface other than the ILOM CLI or WebGUI to alter the state or configuration of any sensor or LED. Doing so could void your warranty.

The sensors and their respective thresholds are as follows:

- Disk backplane ambient temperature (dbp.t_amb)
  - Upper Non Critical—33-degrees C
  - Upper Critical—38-degrees C
  - Upper Non Recoverable—43-degrees C
- CPU 0 (proc0.t_core) and CPU 1 (proc1.t_core) die temperatures
  - Upper Non Critical—60-degrees C
  - Upper Critical—68-degrees C
  - Upper Non Recoverable—75-degrees C

There are four other temperature sensors:

- Front I/O board ambient temperature (io.front.t_amb)
- Rear I/O board ambient temperature (io.rear.t_amb)
- Processor board front ambient temperature (proc.front.t_amb)
- Processor board rear ambient temperature (proc.rear.t_amb)

List of Sensors (X4500)

TABLE 1-1 lists the sensors. TABLE 1-2 displays detailed information about each sensor.

TABLE 1-1 Sun Fire X4500 Sensors

Sensor name	Typical value	Units	Typical state	LNR	LC	LNC	UNC	UC	UNR
proc.p0.t_core	35	degrees C	ok	na	na	na	60	68	75
proc.p1.t_core	38	degrees C	ok	na	na	na	60	68	75
dbp.t_amb	20	degrees C	ok	na	na	na	33	38	43
io.front.t_amb	38	degrees C	ok	na	na	na	90	95	100
io.rear.t_amb	38	degrees C	ok	na	na	na	90	95	100
proc.front.t_amb	29	degrees C	ok	na	na	na	90	95	100
proc.rear.t_amb	32	degrees C	ok	na	na	na	90	95	100
ft0.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft0.f0.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft0.f1.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft1.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft1.f0.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft1.f1.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft2.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft2.f0.speed	5500	RPM	ok	2000	na	na	na	na	10000
ft2.f1.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft3.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft3.f0.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft3.f1.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft4.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft4.f0.speed	5600	RPM	ok	2000	na	na	na	na	10000
ft4.f1.speed	5600	RPM	ok	2000	na	na	na	na	10000
ps0.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ps0.pwrok	0x2	discrete	0x0002	na	na	na	na	na	na
ps0.vinok	0x2	discrete	0x0002	na	na	na	na	na	na
ps1.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na

TABLE 1-1 Sun Fire X4500 Sensors

Sensor name	Typical value	Units	Typical state	LNR	LC	LNC	UNC	UC	UNR
ps1.pwrok	0x2	discrete	0x0002	na	na	na	na	na	na
ps1.vinok	0x2	discrete	0x0002	na	na	na	na	na	na
ps2.prsnt	0x1	discrete	0x0001	na	na	na	na	na	na
ps2.pwrok	na	discrete	na	na	na	na	na	na	na
ps2.vinok	na	discrete	na	na	na	na	na	na	na
io.v_+1v5	1.52	Volts	ok	0.6	0.7	na	na	1.99	2.2
io.v_+2v5	2.52	Volts	ok	1.8	1.99	na	na	2.89	3
io.v_+5v_disk	5.46	Volts	ok	3.98	4.24	na	na	5.75	5.98
io.v_-12v	-12.28	Volts	ok	-15.05	-14.03	na	na	-10.01	-9.07
proc.p0.v_+1v25	1.27	Volts	ok	0.7	0.9	na	na	1.69	1.9
proc.p0.v_+1v5	1.14	Volts	ok	0.6	0.7	na	na	1.99	2.2
proc.p0.v_+2v5	2.57	Volts	ok	1.8	1.99	na	na	2.89	3
proc.p1.v_+1v25	1.27	Volts	ok	0.7	0.9	na	na	1.69	1.9
proc.p1.v_+1v5	1.14	Volts	ok	0.6	0.7	na	na	1.99	2.2
proc.p1.v_+2v5	2.57	Volts	ok	1.8	1.99	na	na	2.89	3
proc.v_+1v8	1.84	Volts	ok	1.1	1.3	na	na	2.3	2.5
sys.v_+12v	12.1	Volts	ok	8.95	9.95	na	na	13.99	14.99
sys.v_+1v2	1.23	Volts	ok	0.6	0.8	na	na	1.7	1.9
sys.v_+3v3	3.32	Volts	ok	2.6	2.79	na	na	3.79	4
sys.v_+3v3stby	3.27	Volts	ok	2.6	2.79	na	na	3.79	4
sys.v_+5v	4.94	Volts	ok	3.98	4.24	na	na	5.75	5.98
sys.v_bat	3.12	Volts	ok	2.4	2.59	na	na	3.6	3.79
bp.locate.btn	0x1	discrete	0x0001	na	na	na	na	na	na
fp.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
fp.locate.btn	0x1	discrete	0x0001	na	na	na	na	na	na
hdd0.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd1.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd2.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd3.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd4.state	0x1	discrete	0x0001	na	na	na	na	na	na

TABLE 1-1 Sun Fire X4500 Sensors

Sensor name	Typical value	Units	Typical state	LNR	LC	LNC	UNC	UC	UNR
hdd5.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd6.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd7.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd8.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd9.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd10.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd11.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd12.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd13.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd14.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd15.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd16.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd17.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd18.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd19.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd20.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd21.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd22.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd23.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd24.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd25.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd26.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd27.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd28.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd29.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd30.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd31.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd32.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd33.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd34.state	0x1	discrete	0x0001	na	na	na	na	na	na

TABLE 1-1 Sun Fire X4500 Sensors

Sensor name	Typical value	Units	Typical state	LNR	LC	LNC	UNC	UC	UNR
hdd35.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd36.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd37.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd38.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd39.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd40.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd41.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd42.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd43.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd44.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd45.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd46.state	0x1	discrete	0x0001	na	na	na	na	na	na
hdd47.state	0x1	discrete	0x0001	na	na	na	na	na	na
sys.intsw	0x0	discrete	0x0000	na	na	na	na	na	na
sys.acpi	0x1	discrete	0x0001	na	na	na	na	na	na

Detailed Sensor Information (X4500)

Interpreting Sensor Data

Asserted/Deasserted - Asserted generally means that what the sensor is measuring is true. For example, if a temperature reaches (for example) its upper critical threshold, then upper critical = asserted. Deasserted means the opposite.

Present/Absent - This tells whether the specified device is present or not.

Reading - Some sensors include hex numbers (usually 0x0001 and 0x0002) that indicate the state of the sensor. These are listed in the table where the field value is "readings".

TABLE 1-2 displays detailed information about the individual sensors.

TABLE 1-2 Detailed Sensor Information for the Sun Fire X4500

Field	Data
Sensor ID	**dbp.t_amb (0x1b)**
Entity ID	15.0 (Drive Backplane)
Sensor Type (Analog)	Temperature
Sensor Reading	23 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	43.000
Upper Critical	38.000
Upper Non-Critical	33.000
Positive Hysteresis	Unspecified
Negative Hysteresis	Unspecified
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**io.front.t_amb (0x50)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Temperature
Sensor Reading	29 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	100.000
Upper Critical	95.000
Upper Non-Critical	90.000
Positive Hysteresis	Unspecified
Negative Hysteresis	Unspecified

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**io.v_+5v_disk (0x10)**
Entity ID	7.0
Sensor Type (Analog)	Voltage
Sensor Reading	4.992 (+/- 0) Volts
Status	OK
Lower Non-Recoverable	4.248
Lower Critical	4.488
Lower Non-Critical	4.728
Upper Non-Critical	5.232
Upper Critical	5.496
Upper Non-Recoverable	5.736
Assertions Enabled	lnc- lcr- lnr- unc+ ucr+ unr+
Deassertions Enabled	lnc- lcr- lnr- unc+ ucr+ unr+
Sensor ID	**io.rear.t_amb (0x5)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Temperature
Sensor Reading	25 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	100.000
Upper Critical	95.000

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Upper Non-Critical	90.000
Positive Hysteresis	2.000
Negative Hysteresis	2.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**proc.front.t_amb (0x22)**
Entity ID	9.0 (Processor Module)
Sensor Type (Analog)	Temperature
Sensor Reading	23 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	100.000
Upper Critical	95.000
Upper Non-Critical	90.000
Positive Hysteresis	Unspecified
Negative Hysteresis	Unspecified
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor ID	**proc.rear.t_amb (0x14)**
Entity ID	9.0 (Processor Module)
Sensor Type (Analog)	Temperature
Sensor Reading	23 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	100.000
Upper Critical	95.000
Upper Non-Critical	90.000
Positive Hysteresis	Unspecified
Negative Hysteresis	Unspecified
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**proc.p0.t_core (0x2c)**
Entity ID	3.0 (Processor)
Sensor Type (Analog)	Temperature
Sensor Reading	41 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	75.000
Upper Critical	68.000
Upper Non-Critical	60.000
Positive Hysteresis	2.000
Negative Hysteresis	2.000

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**proc.p1.t_core (0x35)**
Entity ID	3.1 (Processor)
Sensor Type (Analog)	Temperature
Sensor Reading	39 (+/- 0) degrees C
Status	OK
Upper Non-Recoverable	75.000
Upper Critical	68.000
Upper Non-Critical	60.000
Positive Hysteresis	2.000
Negative Hysteresis	2.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	unc ucr unr
Settable Thresholds	unc ucr unr
Threshold Read Mask	unc ucr unr
Assertions Enabled	ucr+ unr+
Deassertions Enabled	ucr+ unr+
Sensor ID	**ft0.prsnt (0x51)**
Entity ID	30.0 (Cooling Unit)

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ft0.f0.speed (0x54)**
Entity ID	29.0 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft0.f1.speed (0x55)**
Entity ID	29.1 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft1.prsnt (0x52)**
Entity ID	30.1 (Cooling Unit)
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ft1.f0.speed (0x56)**
Entity ID	29.2 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft1.f1.speed (0x57)**
Entity ID	29.3 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft2.prsnt (0x53)**
Entity ID	30.2 (Cooling Unit)

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ft2.f0.speed (0x58)**
Entity ID	29.4 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft2.f1.speed (0x59)**
Entity ID	29.5 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft3.prsnt (0x25)**
Entity ID	30.3 (Cooling Unit)
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ft3.f0.speed (0x27)**
Entity ID	29.6 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7700 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft3.f1.speed (0x29)**
Entity ID	29.7 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	7800 (+/- 0) RPM
Status	OK
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft4.prsnt (0x26)**
Entity ID	30.4 (Cooling Unit)

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor Type (Discrete)	Entity Presence
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ft4.f0.speed (0x2a)**
Entity ID	29.8 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	0 (+/- 0) RPM
Status	Lower Non-Recoverable
Upper Non-Recoverable	10000.000
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ft4.f1.speed (0x2b)**
Entity ID	29.9 (Fan Device)
Sensor Type (Analog)	Fan
Sensor Reading	0 (+/- 0) RPM
Status	Lower Non-Recoverable
Upper Non-Recoverable	10000.000

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Lower Non-Recoverable	2000.000
Positive Hysteresis	1000.000
Negative Hysteresis	1000.000
Minimum Sensor Range	Unspecified
Maximum Sensor Range	25400.000
Event Message Control	Per-threshold
Readable Thresholds	lnr unr
Settable Thresholds	lnr unr
Threshold Read Mask	lnr unr
Assertions Enabled	lnr- unr+
Deassertions Enabled	lnr- unr+
Sensor ID	**ps0.prsnt (0x1c)**
Entity ID	10.0 (Power Supply)
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ps0.pwrok (0x1d)**
Entity ID	10.0 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
States Asserted	Digital State [State Asserted]
Assertions Enabled	Digital State [State Deasserted] [State Asserted]

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor ID	**ps0.vinok (0x1e)**
Entity ID	10.0 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
States Asserted	Digital State [State Asserted]
Assertions Enabled	Digital State [State Deasserted] [State Asserted]
Sensor ID	**ps1.prsnt (0x1f)**
Entity ID	10.1 (Power Supply)
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ps1.pwrok (0x20)**
Entity ID	10.1 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
States Asserted	Digital State [State Asserted]
Assertions Enabled	Digital State [State Deasserted] [State Asserted]
Sensor ID	**ps1.vinok (0x21)**

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Entity ID	10.1 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
States Asserted	Digital State [State Asserted]
Assertions Enabled	Digital State [State Deasserted] [State Asserted]
Sensor ID	**ps2.prsnt (0x24)**
Entity ID	10.2 (Power Supply)
Sensor Type (Discrete)	Entity Presence
Reading	0x0001 = Device Absent 0x0002 = Device Present
States Asserted	Availability State [Device Absent]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**ps2.pwrok (0xf)**
Entity ID	10.2 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
Sensor ID	**ps2.vinok (0x28)**
Entity ID	10.2 (Power Supply)
Sensor Type (Discrete)	Power Supply
Reading	0x0001 = State Deasserted 0x0002 = State Asserted
Sensor ID	**io.v_+1v5 (0x23)**

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	1.536 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	2.196
Upper Critical	1.992
Upper Non-Critical	1.800
Lower Non-Recoverable	0.600
Lower Critical	0.696
Lower Non-Critical	0.792
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**io.v_+2v5 (0xc)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	2.532 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	3.000
Upper Critical	2.892
Upper Non-Critical	2.796
Lower Non-Recoverable	1.800

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Lower Critical	1.992
Lower Non-Critical	2.196
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**io.v_-12v (0xb)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	-12.204 (+/- -16.000) Volts
Status	OK
Upper Non-Recoverable	-9.065
Upper Critical	-10.014
Upper Non-Critical	-11.036
Lower Non-Recoverable	-15.051
Lower Critical	-14.029
Lower Non-Critical	-13.007
Positive Hysteresis	0.133
Negative Hysteresis	0.133
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.p0.v_+1v25 (0x2f)**
Entity ID	3.0 (Processor)
Sensor Type (Analog)	Voltage
Sensor Reading	1.272 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	1.896
Upper Critical	1.692
Upper Non-Critical	1.500
Lower Non-Recoverable	0.696
Lower Critical	0.900
Lower Non-Critical	1.092
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.p0.v_+1v5 (0x2d)**
Entity ID	3.0 (Processor)
Sensor Type (Analog)	Voltage

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor Reading	1.404 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	2.196
Upper Critical	1.992
Upper Non-Critical	1.800
Lower Non-Recoverable	0.600
Lower Critical	0.696
Lower Non-Critical	0.792
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.p0.v_+2v5 (0x2e)**
Entity ID	3.0 (Processor)
Sensor Type (Analog)	Voltage
Sensor Reading	2.580 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	3.000
Upper Critical	2.892
Upper Non-Critical	2.796
Lower Non-Recoverable	1.800
Lower Critical	1.992
Lower Non-Critical	2.196

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lcr- lnr- ucr+ unr+
Deassertions Enabled	lcr- lnr- ucr+ unr+
Sensor ID	**proc.p1.v_+1v25 (0x38)**
Entity ID	3.1 (Processor)
Sensor Type (Analog)	Voltage
Sensor Reading	1.272 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	1.896
Upper Critical	1.692
Upper Non-Critical	1.500
Lower Non-Recoverable	0.696
Lower Critical	0.900
Lower Non-Critical	1.092
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.p1.v_+1v5 (0x36)**
Entity ID	3.1 (Processor)
Sensor Type (Analog)	Voltage
Sensor Reading	1.404 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	2.196
Upper Critical	1.992
Upper Non-Critical	1.800
Lower Non-Recoverable	0.600
Lower Critical	0.696
Lower Non-Critical	0.792
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.p1.v_+2v5 (0x37)**
Entity ID	3.1 (Processor)
Sensor Type (Analog)	Voltage
Sensor Reading	2.568 (+/- 0) Volts
Status	OK

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Upper Non-Recoverable	3.000
Upper Critical	2.892
Upper Non-Critical	2.796
Lower Non-Recoverable	1.800
Lower Critical	1.992
Lower Non-Critical	2.196
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**proc.v_+1v8 (0xd)**
Entity ID	9.0 (Processor Module)
Sensor Type (Analog)	Voltage
Sensor Reading	1.840 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	2.500
Upper Critical	2.300
Upper Non-Critical	2.100
Lower Non-Recoverable	1.100
Lower Critical	1.300
Lower Non-Critical	1.500
Positive Hysteresis	0.100
Negative Hysteresis	0.100

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**sys.v_+12v (0xa)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	12.159 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	14.994
Upper Critical	13.986
Upper Non-Critical	12.978
Lower Non-Recoverable	8.946
Lower Critical	9.954
Lower Non-Critical	10.962
Positive Hysteresis	0.063
Negative Hysteresis	0.063
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Sensor ID	**sys.v_+1v2 (0xe)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	1.220 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	1.900
Upper Critical	1.700
Upper Non-Critical	1.500
Lower Non-Recoverable	0.600
Lower Critical	0.800
Lower Non-Critical	1.000
Positive Hysteresis	0.100
Negative Hysteresis	0.100
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**sys.v_+3v3 (0x8)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	3.304 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	3.996
Upper Critical	3.789

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Upper Non-Critical	3.598
Lower Non-Recoverable	2.595
Lower Critical	2.785
Lower Non-Critical	2.993
Positive Hysteresis	0.087
Negative Hysteresis	0.087
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**sys.v_+3v3stby (0x7)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	3.287 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	3.996
Upper Critical	3.789
Upper Non-Critical	3.598
Lower Non-Recoverable	2.595
Lower Critical	2.785
Lower Non-Critical	2.993
Positive Hysteresis	0.087
Negative Hysteresis	0.087
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**sys.v_+5v (0x9)**
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	4.992 (+/- 0) Volts
Status	OK
Upper Non-Recoverable	6.500
Upper Critical	5.980
Upper Non-Critical	5.486
Lower Non-Recoverable	3.484
Lower Critical	3.978
Lower Non-Critical	4.498
Positive Hysteresis	0.078
Negative Hysteresis	0.078
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**sys.v_bat (0x6)**

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Entity ID	7.0 (System Board)
Sensor Type (Analog)	Voltage
Sensor Reading	0.608 (+/- 0) Volts
Status	Lower Non-Recoverable
Upper Non-Recoverable	3.792
Upper Critical	3.600
Upper Non-Critical	3.392
Lower Non-Recoverable	2.400
Lower Critical	2.592
Lower Non-Critical	2.688
Positive Hysteresis	0.096
Negative Hysteresis	0.096
Minimum Sensor Range	Unspecified
Maximum Sensor Range	Unspecified
Event Message Control	Per-threshold
Readable Thresholds	lnr lcr ucr unr
Settable Thresholds	lnr lcr ucr unr
Threshold Read Mask	lnr lcr ucr unr
Assertions Enabled	lnc- lcr- ucr+ unr+
Deassertions Enabled	lnc- lcr- ucr+ unr+
Sensor ID	**bp.locate.btn (0x11)**
Entity ID	13.0 (Back Panel Board)
Sensor Type (Discrete)	Button
States Asserted	Digital State [State Asserted]
Sensor ID	**fp.prsnt (0x19)**
Entity ID	12.0 (Front Panel Board)
Sensor Type (Discrete)	Entity Presence

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Reading	0x0001 = Device Absent (front panel is absent) 0x0002 = Device Present (front panel is present)
States Asserted	Availability State [Device Present]
Assertions Enabled	Availability State [Device Absent] [Device Present]
Sensor ID	**fp.locate.btn (0x18)**
Entity ID	12.0 (Front Panel Board)
Sensor Type (Discrete)	Button
Reading	0x0001 = State Deasserted (button is inactive) 0x0002 = State Asserted (button is active)
States Asserted	Digital State [State Deasserted]
Sensor ID	**hdd0.state (0x5a)**
Entity ID	4.0 (Disk or Disk Bay)
Sensor Type (Discrete)	Drive Slot / Bay
States Asserted	Drive Slot [Drive Present] [Drive Fault]
Assertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]
Deassertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]
Sensor ID	**hdd1.state (0x5b)**
Entity ID	4.1 (Disk or Disk Bay)
Sensor Type (Discrete)	Drive Slot / Bay

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Assertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]
Deassertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]

Disk drive sensors hdd1 through hdd47 are identical, except for Sensor ID and Entity ID. Hdd1 through hdd47 appear in the CLI but not in the GUI.

Sensor ID = HDD*NN*.state (0x*YY*)

NN = 1 through 47

To calculate *YY*, convert *NN* to hex and add it to 5b.

Entity ID = 4.1 through 4.47

Sensor ID	**hdd47.state (0x89)**
Entity ID	4.47 (Disk or Disk Bay)
Sensor Type (Discrete)	Drive Slot / Bay
Assertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]
Deassertions Enabled	Drive Slot [Drive Present] [Drive Fault] [Hot Spare] [Rebuild In Progress]

Sensor ID	**sys.intsw (0x1)**
Entity ID	23.0 (System Chassis)
Sensor Type (Discrete)	Physical Security

TABLE 1-2 Detailed Sensor Information for the Sun Fire *(Continued)*X4500

Field	Data
Reading	0x0001 = Intrusion switch active 0x0002 = Intrusion switch inactive
States Asserted	Physical Security [General Chassis intrusion]
Assertions Enabled	Physical Security [General Chassis intrusion]

Sensors For Sun Fire X4540 Servers

The Sun Fire X4540 server includes a number of sensors that generate entries in the system event log (SEL) when the sensor crosses a threshold. Many of these readings are used to adjust the fan speeds and perform other actions, such as illuminating LEDs and powering off the chassis.

These sensors can also be configured to generate IPMI PET traps as described in the corresponding ILOM user's guide.

This section describes the sensors and provides details about their operation.

Complete List of Sensors (X4540)

TABLE 1-3 lists the Sun Fire X4540 sensors and their values. The following sections provide information about the different types of sensors.

TABLE 1-3 Sun Fire X4540 Sensors

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
sys.v_+3v3stby	3.287	Volts	ok	2.630	2.803	na	na	3.789	3.944
sys.v_+3v3	3.287	Volts	ok	2.630	2.803	na	na	3.789	3.944
bat.v_bat	3.058	Volts	ok	2.200	2.402	na	na	3.604	3.978
sys.v_+12v	12.159	Volts	ok	9.576	10.143	na	na	13.797	14.364
sys.v_+1v2ht	1.220	Volts	ok	0.600	0.800	na	na	1.700	1.900
sys.intsw	0x0	discrete	0x0000	na	na	na	na	na	na
sys.nmi	0x0	discrete	0x0000	na	na	na	na	na	na

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
sys.reset.btn	0x0	discrete	0x0000	na	na	na	na	na	na
sys.acpi	0x1	discrete	0x0001	na	na	na	na	na	na
sys.locate.btn	0x1	discrete	0x0001	na	na	na	na	na	na
proc.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
proc.front.t_amb	32.000	degrees C	ok	na	na	na	90.000	95.000	100.000
proc.rear.t_amb	37.000	degrees C	ok	na	na	na	90.000	95.000	100.000
p0.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
p0.hot	0x1	discrete	0x0001	na	na	na	na	na	na
p0.t_core	28.000	degrees C	ok	na	na	na	62.000	67.000	75.000
p0.v_vddcore	1.224	Volts	ok	0.804	0.900	na	na	1.704	1.800
p0.v_+1v8	1.848	Volts	ok	1.440	1.524	na	na	2.064	2.160
p0.v_+0v9	0.912	Volts	ok	0.720	0.756	na	na	1.032	1.080
p1.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
p1.hot	0x1	discrete	0x0001	na	na	na	na	na	na
p1.v_vddcore	1.224	Volts	ok	0.804	0.900	na	na	1.704	1.800
p1.t_core	29.000	degrees C	ok	na	na	na	62.000	67.000	75.000
p1.v_+1v8	1.848	Volts	ok	1.440	1.524	na	na	2.064	2.160
p1.v_+0v9	0.912	Volts	ok	0.720	0.756	na	na	1.032	1.080
io.rear.t_amb	51.000	degrees C	ok	na	na	na	90.000	95.000	100.000
io.front.t_amb	46.000	degrees C	ok	na	na	na	90.000	95.000	100.000
dbp.t_amb	29.000	degrees C	ok	na	na	na	na	33.000	43.000
io.v_bat	3.058	Volts	ok	2.200	2.402	na	na	3.604	3.806
io.v_+3v3stby	3.304	Volts	ok	2.630	2.803	na	na	3.789	3.944
io.v_+3v3	3.356	Volts	ok	2.630	2.803	na	na	3.789	3.944
io.v_+5v	5.018	Volts	ok	3.978	4.238	na	na	5.746	5.980
io.v_+12v	12.159	Volts	ok	9.576	10.143	na	na	13.797	14.364
io.v_+5v_disk	5.136	Volts	ok	3.984	4.248	na	na	5.736	6.000
io.v_+1v5	1.512	Volts	ok	1.200	1.272	na	na	1.716	1.788
io.v_+1v4	1.404	Volts	ok	1.116	1.188	na	na	1.608	1.680
io.v_+1v8	1.840	Volts	ok	1.440	1.530	na	na	2.060	2.160

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
io.v_+1v2	1.220	Volts	ok	0.960	1.020	na	na	1.380	1.440
ft0.f0.speed	6900.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft0.f1.speed	6900.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft1.f0.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft1.f1.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft2.f0.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft2.f1.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft3.f0.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft3.f1.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft4.f0.speed	6900.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft4.f1.speed	6800.000	RPM	ok	na	3000.000	4000.000	8500.000	9000.000	na
ft0.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft1.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft2.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft3.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ft4.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ps0.vinok	0x2	discrete	0x0002	na	na	na	na	na	na
ps0.pwrok	0x2	discrete	0x0002	na	na	na	na	na	na
ps1.vinok	0x2	discrete	0x0002	na	na	na	na	na	na
ps1.pwrok	0x2	discrete	0x0002	na	na	na	na	na	na
ps0.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ps1.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
ps2.vinok	0x2	discrete	0x0002	na	na	na	na	na	na
ps2.pwrok	0x2	discrete	0x0002	na	na	na	na	na	na
ps2.prsnt	0x2	discrete	0x0002	na	na	na	na	na	na
hdd0.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd0.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd1.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd1.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd2.state	0x0	discrete	0x0000	na	na	na	na	na	na

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
hdd2.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd3.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd3.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd4.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd4.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd5.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd5.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd6.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd6.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd7.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd7.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd8.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd8.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd9.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd9.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd10.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd10.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd11.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd11.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd12.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd12.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd13.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd13.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd14.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd14.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd15.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd15.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd16.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd16.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd17.state	0x0	discrete	0x0000	na	na	na	na	na	na

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
hdd17.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd18.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd18.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd19.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd19.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd20.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd20.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd21.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd21.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd22.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd22.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd23.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd23.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd24.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd24.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd25.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd25.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd26.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd26.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd27.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd27.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd28.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd28.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd29.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd29.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd30.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd30.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd31.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd31.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd32.state	0x0	discrete	0x0000	na	na	na	na	na	na

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
hdd32.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd33.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd33.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd34.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd34.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd35.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd35.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd36.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd36.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd37.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd37.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd38.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd38.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd39.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd39.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd40.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd40.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd41.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd41.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd42.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd42.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd43.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd43.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd44.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd44.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd45.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd45.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd46.state	0x0	discrete	0x0000	na	na	na	na	na	na

TABLE 1-3 Sun Fire X4540 Sensors *(Continued)*

Sensor Name	Typical Value	Units	Typical State	LNR	LC	LNC	UNC	UC	UNR
hdd46.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd47.state	0x0	discrete	0x0000	na	na	na	na	na	na
hdd47.hba.state	0x0	discrete	0x0000	na	na	na	na	na	na

FRU Presence Sensors (X4540)

TABLE 1-4 FRU Presence Sensors

Sensor	Event	Description/Action
ft*N*.prsnt Fan Tray *N*	Asserted	Fan Tray *N* installed. Fan Tray fail LED is OFF.
	Deasserted	Fan Tray *N* removed. Fan Tray fail LED is ON.
ps*N*.prsnt Power Supply *N*	Asserted	PSU *N* installed. PSU fail LED is OFF.
	Deasserted	PSU *N* removed. PSU fail LED is ON.
proc.prsnt Processor Board (not hot pluggable)	Asserted	Processor Board installed
	Deasserted	Processor Board removed
p*N*.prsnt Processor *N* (not hot pluggable)	Asserted	Processor *N* installed.
	Deasserted	Processor *N* removed.

Fault Sensors (X4540)

TABLE 1-5 Fault Sensors

Sensor	Event	Description/Action
p*N*.hot Processor *N* Too Hot	Asserted	Processor is too hot
	Deasserted	Processor no longer too hot
ps*N*.vinok Power Supply *N* Input Power OK	Asserted	AC input power is OK. PSU fault LED is OFF.
	Deasserted	AC input power is bad/absent. PSU fault LED is ON.
ps*N*.pwrok Power Supply *N* Output Power OK	Asserted	DC output power is OK. PSU fault LED is OFF.
	Deasserted	DC output power is bad. PSU fault LED is ON.

Discrete Sensors (X4540)

TABLE 1-6 Discrete Sensors

Sensor	Event	Description/Action
sys.intsw Processor *N*:0..1	Asserted	Assert
	Deasserted	Deasserted
sys.reset.btn Reset Button	Asserted	Assert
	Deasserted	Deasserted
sys.locate.btn Locate Button	Asserted	Assert
	Deasserted	Deasserted
sys.acpi ACPI	Asserted	Assert
	Deasserted	Deasserted
sys.nmi Non-Maskable Interrupt	Asserted	Assert
	Deasserted	Deasserted

Fan Speed Sensors (X4540)

TABLE 1-7 Fan Speed Sensors

Sensor	Threshold Event	Description/Action
ft*N*.fanM.speed Speed of Fan Tray *N*:0..4 Fan M:0.1	UNR+ Assert	Speed has exceeded non-recoverable threshold. Fan Tray fault LED is ON.
	UNR+ Deassert	Speed has dropped below non-recoverable threshold.
	UC+ Assert	Speed has exceeded critical threshold. Fan Tray fault LED is ON. If one fan is faulty, Fan Tray ACT LED is slow blink. If both fans are faulty, Fan Tray ACT LED is OFF.
	UC+ Deassert	Speed has dropped below critical threshold.
	UNC+ Assert	Speed has exceeded non-critical threshold. Fan fault LED is ON. Fan Tray fault LED is ON. If one fan is faulty, Fan Tray ACT LED is slow blink. If both fans are faulty, Fan Tray ACT LED is OFF.
	UNC+ Deassert	Speed has dropped below non-critical threshold. Fan Tray fault LED is OFF.

Temperature Sensors (X4540)

TABLE 1-8 Temperature Sensors

Sensor	Threshold Event	Description/Action
p*N*.t_core Core temperature of processor *N*	UNR+ Assert	Temperature has increased above non-recoverable threshold. Over Temperature LED is ON and System Alert LED is ON. Host Power is turned OFF.
	UNR+ Deassert	Temperature has returned to critical from non-recoverable. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Assert	Temperature has increased above critical threshold. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Deassert	Temperature has returned to non-critical from critical. Over Temperature LED is OFF and System Alert LED is OFF
	UNC+ Assert	Temperature has increased above non-critical threshold.

TABLE 1-8 Temperature Sensors *(Continued)*

Sensor	Threshold Event	Description/Action
	UNC+ Deassert	Temperature has returned to normal from non-critical.
dbp.t_amb Ambient temperature measured on the disk backplane	UNR+ Assert	Temperature has increased above non-recoverable threshold. Over Temperature LED is ON and System Alert LED is ON. Host Power is turned OFF.
	UNR+ Deassert	Temperature has returned to critical from non-recoverable. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Assert	Temperature has increased above critical threshold. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Deassert	Temperature has returned to non-critical from critical. Over Temperature LED is OFF and System Alert LED is OFF
	UNC+ Assert	Temperature has increased above non-critical threshold.
	UNC+ Deassert	Temperature has returned to normal from non-critical.
io.rear.t_amb Ambient temperature measured at rear of I/O board	UNR+ Assert	Temperature has increased above non-recoverable threshold. Over Temperature LED is ON and System Alert LED is ON. Host power is unchanged.
	UNR+ Deassert	Temperature has returned to critical from non-recoverable. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Assert	Temperature has increased above critical threshold. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Deassert	Temperature has returned to non-critical from critical. Over Temperature LED is OFF and System Alert LED is OFF.
	UNC+ Assert	Temperature has increased above non-critical threshold.
	UNC+ Deassert	Temperature has returned to normal from non-critical.
io.front.t_amb Ambient temperature measured at rear of I/O board	UNR+ Assert	Temperature has increased above non-recoverable threshold. Over Temperature LED is ON and System Alert LED is ON. Host power is unchanged.
	UNR+ Deassert	Temperature has returned to critical from non-recoverable. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Assert	Temperature has increased above critical threshold. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Deassert	Temperature has returned to non-critical from critical. Over Temperature LED is OFF and System Alert LED is OFF.
	UNC+ Assert	Temperature has increased above non-critical threshold.

TABLE 1-8 Temperature Sensors *(Continued)*

Sensor	Threshold Event	Description/Action
	UNC+ Deassert	Temperature has returned to normal from non-critical.
proc.rear.t_amb Ambient temperature measured at rear of Processor board	UNR+ Assert	Temperature has increased above non-recoverable threshold. Over Temperature LED is ON and System Alert LED is ON. Host power is unchanged.
	UNR+ Deassert	Temperature has returned to critical from non-recoverable. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Assert	Temperature has increased above critical threshold. Over Temperature LED is ON and System Alert LED is ON.
	UC+ Deassert	Temperature has returned to non-critical from critical. Over Temperature LED is OFF and System Alert LED is OFF.
	UNC+ Assert	Temperature has increased above non-critical threshold.
	UNC+ Deassert	Temperature has returned to normal from non-critical.

Voltage Sensors (X4540)

TABLE 1-9 Voltage Sensors

Sensor	Description
bat.v_bat	Battery voltage measured on Processor Board
sys.v_+12v	+12V measured on Processor Board
sys.v_+1v2ht	+1.2V measured on Processor Board
sys.v_+3v3	+3.3V measured on Processor Board
sys.v_+3v3stby	+3.3V standby measured on Processor Board
io.v_+12v	+12V measured on I/O Board
io.v_+1v2	+1.2V measured on I/O Board
io.v_+1v4	+1.4V measured on I/O Board
io.v_+1v5	+1.5V measured on I/O Board
io.v_+1v8	+1.8V measured on I/O Board
io.v_+3v3	+3.3V measured on I/O Board
io.v_+3v3stby	+3.3V standby measured on I/O Board
io.v_+5v	+5V measured on I/O Board
io.v_+5v_disk	+5V disk measured on I/O Board
io.v_bat	Battery voltage measured on I/O Board
p*N*.v_+0v9	Processor *N* +0.9V
p*N*.v_+1v8	Processor *N* +1.8V
p*N*.v_vddcore	Processor *N* core voltage

Voltage Sensor Details (X4540)

TABLE 1-10 Voltage Sensor Details

Sensor	Threshold Event	Description/Action
All		
	UNR+ Deassert	Voltage has returned to critical from non-recoverable.
	UC+ Assert	Voltage has increased above upper critical threshold. System Power Fail LED is ON. For sys.v_bat, battery LED is on.
	UC+ Deassert	Voltage has returned to non-critical from critical.
	UNC+ Assert	Voltage has increased above non-critical threshold. System Power Fail LED is ON. For sys.v_bat, battery LED is on.
	LC- Assert	Voltage has decreased below lower critical threshold. System Power Fail LED is ON (except sys. and bat.). For sys.v_bat, battery LED is on.
	LC- Deassert	Voltage has returned to non-critical from critical.
	LNR+ Assert	Voltage has decreased below lower non-recoverable threshold. System Power Fail LED is ON (except sys. and bat.). For sys.v_bat, battery LED is on.
	LNR+ Deassert	Voltage has returned to critical from non-recoverable.

CHAPTER 2

Firmware Update Procedures

This chapter describes the processes for updating the firmware that resides on:

- The server itself (BIOS)
- The server's Service Processor (ILOM)

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

The procedures to update the ILOM and BIOS are:

Determining the Service Processor IP Address

You use the Service Processor (SP) on your Sun Fire X4500/X4540 Server server for various firmware update tasks and you must use its IP address to access it. If you do not already know the Service Processor's IP address, you must determine it.

There are several different methods you can use to locate ILOM SPs and their IP addresses.

1. Sun xVM Ops Center (a successor to N1 System Manager). It supports:

- Sun Fire T5120, T5220
- Sun Fire X2100, X2100 M2, X2200 M2, X4100, X4100 M2, X4150, X4200, X4200 M2, X4450, X4500, X4600, X4600 M2
- Sun Blade T6320, X6220, X6250, X8420, X8440

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

`http://docs.sun.com/app/docs/doc/820-4504`

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

3. **Linux and Solaris open-source `nmap` command.** The open-source `nmap` command provides a `-p` port option to scan for port 623, which can be used to quickly detect IPMI-enabled devices (such as your server's SP) on a network. For example:

```
nmap -p 623 10.6.154.1/24
```

Determining Your Current Firmware Versions

There are three alternate procedures in this section that you can use:

- "To Access the CLI Through the Management Ethernet Port" on page 52
- "To Access the CLI Through the Serial Port" on page 53
- "To Access the Web Interface" on page 54

▼ To Access the CLI Through the Management Ethernet Port

See your server's ILOM documentation for more detailed information on this procedure.

1. **Connect an RJ-45 Ethernet cable to the NET MGT Ethernet port on the .**

   Establish an SSH connection using the following command:

   ```
   # ssh -l root <sp_ip>
   ```

   where <*sp_ip*> is the IP address of the server's Service Processor.

   Enter the default password when you are prompted:

   ```
   changeme
   ```

2. **After you have successfully logged in, the SP displays its default command prompt:**

   ```
   ->
   ```

3. **Type the version command, which returns output similar to the following:**

   ```
   -> version
   SP firmware version: 1.0
   SP firmware build number: 10644
   SP firmware date: Tue Sep 13 12:50:37 PDT 2006
   SP filesystem version: 0.1.13
   ```

The ILOM (SP) firmware version and build number are listed above.

▼ To Access 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:
   ```

   Here, `0003BA84D777` is the Ethernet MAC address of the SP. This will be 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 its default command prompt:

   ```
   ->
   ```

5. **Type the version command, which returns output similar to the following:**

   ```
   -> version
   SP firmware version: 1.0
   SP firmware build number: 10644
   SP firmware date: Tue Sep 13 12:50:37 PDT 2006
   SP filesystem version: 0.1.13
   ```

The ILOM firmware version and build number are listed above.

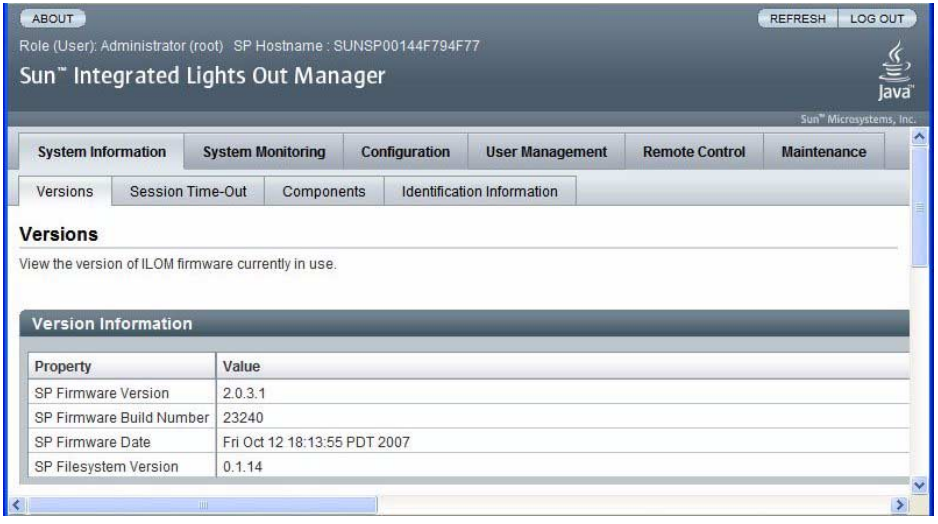
▼ To Access the Web Interface

1. **Connect to the ILOM Web interface by entering 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 first Web page presented is the `System Information -> Versions` page, which includes the firmware version and build number.



Downloading New Firmware

Download the flash image `.ima` file using these steps:

1. **Browse to** `http://www.sun.com/download/`
2. **Locate the Hardware Drivers section.**
3. **Click the X64 Servers and Workstations.**
4. **Click the link for the Sun Fire X4500/X4540 Server 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*`.ima`

   For example:

   `ilom.X4500-2.0.2.5-r34717.ima`

Flashing the ILOM/BIOS Firmware

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.

There are three ways you can flash the ILOM/BIOS firmware:

- Use the ILOM Web interface.
- Use the ILOM CLI `load` command.

- Use the Sun xVM Ops Center.

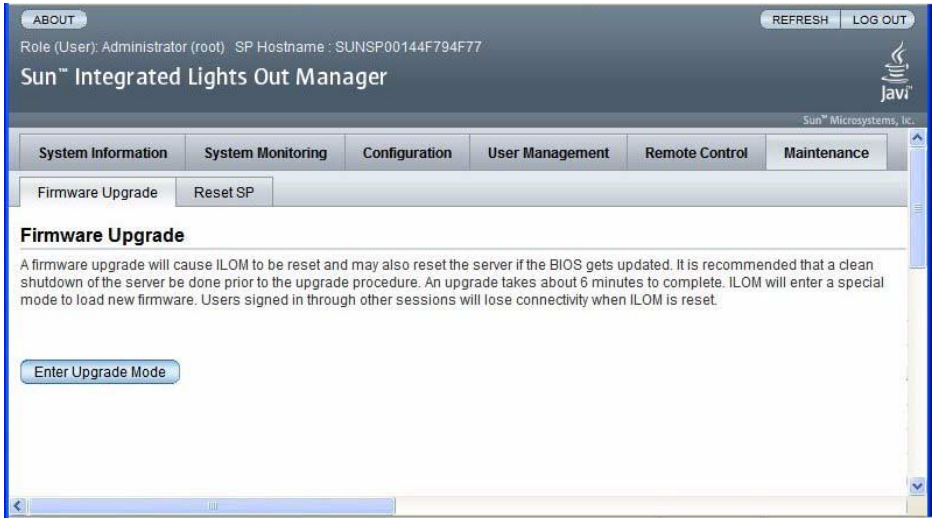
Note – Due to increased memory use during Web GUI operations, you might find that using the ILOM GUI, which is the easiest procedure, will not work satisfactorily. In such a case, you will need to use the ILOM CLI `load` command or the N1 System Manager to flash the firmware.

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.**



Flashing the Firmware With the ILOM CLI

1. **Log onto the ILOM CLI through the Management Ethernet Port (see** "To Access the CLI Through the Management Ethernet Port" on page 52**) or the serial port (see** "To Access the CLI Through the Serial Port" on page 53**).**

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

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

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

   `ilom.X6220-2.0.3.2-r26980.ima`

Flashing the Firmware With the Sun xVM Ops Center

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

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

Clearing CMOS Settings (Optional)

If you cannot get output to 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, use the following commands (in this example, the default username, `root`, and the default password, `changeme`, are used):

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

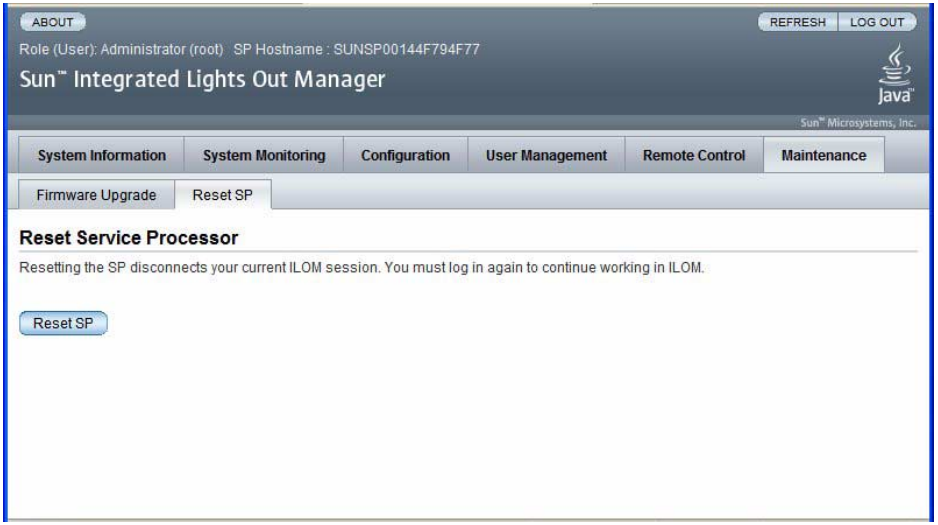
where *SP-IP* is the IP address of the service processor.

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.



- 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 complete details, see the ILOM documentation for your server.

Recovering From a Failed Flash Update

Caution – The last ILOM firmware released for your server must be used to recover from a failed flash update.

Use the following procedure to recover from a failed firmware update.

Note – In a small percentage of cases (such as when no output is displayed on the SP serial port), the Service Processor must be replaced.

Prerequisites

- A trivial file-transfer protocol (TFTP) server is required to reload the ILOM firmware.
- The host system must remain powered off for the duration of the recovery process.

Note – Numbers in the text below are in hexadecimal unless otherwise noted.

Recovery Steps

Note – The U-Boot recovery procedure applies only to the X4500 system.

1. **Determine whether the ILOM SP first-level booter (referred to in this procedure as U-Boot) is intact. Follow documented procedures to connect to the SP serial port, apply power to the system, and observe the initial ILOM boot messages.**

   Refer to *Sun Fire X4500/X4540 Server Installation Guide* for details.

   - If no screen output is displayed, stop here. The SP must be replaced. Refer to *Sun Fire X4500/X4540 Server Service Manual* for instructions.
   - If screen output is displayed, continue to the next step.

2. **Enter the ILOM SP U-Boot command interpreter with `xyzzy`.**

   When the message, `Booting linux in 2 seconds...` is displayed, during ILOM initial boot, type **`xyzzy`** to enter the U-Boot command interpreter.

Note – You have only 2 seconds to enter **`xyzzy`**. The characters typed will not echo. Cutting and pasting the characters improves the chance of success. You might need to try the process of applying power to the system and entering **`xyzzy`** several times.

3. **Disable automatic reboot.**

   Set the U-Boot environment variable, `bootretry`, to `-1` to temporarily disable automatic reboot:

   ```
   set bootretry -1
   ```

4. **Configure the network for TFTP access.**

   a. **Copy the ILOM SP firmware image to a TFTP server that is accessible on the same IP subnet as the ILOM SP network port.**

Note – If the ILOM SP and TFTP server are not on the same IP subnet, set the `gatewayip` and `netmask` variables:
`set gatewayip a.b.c.d`
`set netmask e.f.g.h`
where a.b.c.d is the router IP address and e.f.g.h is the netmask for the subnet.

---

   b. **Set the IP address for the ILOM SP and the TFTP server IP address by setting the `ipaddr` and `serverip` U-Boot variables.**

   ```
   set ipaddr n.n.n.n
   set serverip n.n.n.n
   ```

   c. **(For modular chassis and blades only) Run the U-boot command `mii`:**

   ```
   mii write 4 0 2000
   ```

   This command, which sets the Ethernet port to 10 Mb full duplex, is required for the SP on any blade and the CMM on any chassis.

5. **Use the U-Boot `tftp` command to download the ILOM firmware image into RAM, beginning at location `100000`. Using this address guarantees that you will not overwrite any part of the flash images.**

   `tftp 100000 ilom.`*`firmware`*`.ima`

   where `ilom.`*`firmware`*`.ima is the image file`, for example, `ilom.X6220-2.0.3.2-r26980.ima`

Note – If the TFTP server or filename is incorrect, you might need to enter Ctrl-C to halt the `tftp` command, then repeat this recovery procedure.

   Be sure that the complete flash image is actually downloaded successfully before proceeding. You should see a message similar to:

   ```
   => tftp 100000 ilom.X6220-2.0.3.2-r26980.ima
   Using FCC1 ETHERNET device
   TFTP from server 10.6.154.8; our IP address is 10.6.154.99
   ```

```
Filename 'ilom.X6220-2.0.3.2-r26980.ima'.
Load address: 0x100000
Loading:
#################################################################
#################################################################
#################################################################
#################################################################
##########################
done
Bytes transferred = 14680064 (e00000 hex)
```

6. **Confirm that the download succeeded:**

   a. **Confirm that the** `tftp` **command output ends with**
   `Bytes transferred =` *ByteCount*

   The size in bytes of the firmware image depends on the ILOM version. For ILOM 1.1.x and later, the size is 14 Mb (14680064 bytes, or `e00000` in hex). For ILOM 1.0.x, the size may be 13 Mb (`c80000`) or smaller.

   b. **Use the U-boot** `md` **command (memory display) and confirm that its output displays strings from the beginning of the firmware image file. For example:**

```
=> md 100000
00100000: 244d4f44 554c4524 01004000 00000200    $MODULE$..@.....
00100010: 00000000 000000f2 67726173 70000000    ........grasp...
00100020: 01000200 40000000 61000000 0000ffff    ....@...a.......
00100030: ffff0000 00000100 00000000 0000aa55    ...............U
00100040: 46575f56 45525349 4f4e3d31 2e302e31 FW_VERSION=2.0.3.2
00100050: 0a46575f 44415445 3d4d6172 20203320 .FW_DATE=Jan 3
00100060: 32303036 0a46575f 4255494c 4454494d    2008.FW_BUILDTIM
00100070: 453d3130 3a35363a 30370a46 575f4445    E=10:56:07.FW_DE
00100080: 53433d57 41524e49 4e47203a 20554e4f    SC=WARNING : UNO
00100090: 46464943 49414c20 4255494c 44212120    FFICIAL BUILD!!
001000a0: 0affffff ffffffff ffffffff ffffffff    ................
```

7. **Erase the existing ILOM flash image:**

Caution – Interrupting the flash recovery process from this point onwards, or entering an incorrect U-Boot command, might result in a disabled service processor, which will require replacement. DO NOT stop or remove power from the system from this point onward.

   a. **Use the U-boot** `erase` **command to erase existing firmware images:**

```
=> erase fe200000 ffffffff
```

A series of dots will appear, indicating the progress of the erasure.

b. If you see the error message: `Step Warning: protected sectors will not be erased!` **precede the** `erase` **command with the** `protect off` **command:**

```
=> protect off fe200000 ffffffff
=> erase fe200000 ffffffff
```

c. If a failure occurs, retry the `erase` **command repeatedly until it succeeds.**

Note – If a persistent failure occurs, the service processor is not flash-upgradable, and must be replaced. Refer to *Sun Fire X4500/X4540 Server Service Manual*, for details on replacing the service processor.

---

8. Load the new ILOM firmware image:

a. Use the U-Boot `cp.b` **command to copy the new ILOM firmware image from the download location:**

`cp.b 100000` *`StartAddress ByteCount`*

For a 14 Mb byte count image file:

```
=> cp.b 100000 ff200000 e00000
Copy to Flash
.............................................................
.............................................................
..............done
```

Note – If the firmware file size (byte count) is not 14 Mb (`e00000`), use (`ffffffff - bytecount + 1`) as the starting address. For example with a 12.5 Mb file (`c80000`), you would use `cp.b 100000 ff380000 c80000`.

---

b. Use the U-Boot `fmh` **command (firmware module header) to verify that the copy succeeded and to view the new ILOM firmware image location.**

Note – Do not attempt to reset the service processor before you have verified that the `cp.b` copy has succeeded.

The `fmh` command should display firmware sections. For example:

```
=> fmh
Listing FMH Modules
Flash Size : 32768 KB
Erase Size : 64 KB
Sector Count : 512
FMH Located at 0xff200000 of Size 0x00020000
Name : grasp
```

```
Ver : 1.0
Type : 0x0002
Flags : 0x0000
Size : 0x00000061
Location: 0xff380040
LoadAddr: 0xffffffff
CheckSum: Not Computed
-------------------------------------------------
FMH Located at 0xff3a0000 of Size 0x00120000
Name : sysbios
Ver : 1.31
Type : 0x0000
Flags : 0x0100
Size : 0x00100000
Location: 0xff3c0000
Flash Upgrading Your Server to Release 1.1 13
LoadAddr: 0xffffffff
CheckSum: Valid
-------------------------------------------------
FMH Located at 0xff4c0000 of Size 0x000c0000
Name : osimage
Ver : 1.0
Type : 0x0006
Flags : 0x0119
Size : 0x000ac9c8
Location: 0xff4c0040
LoadAddr: 0x00c00000
CheckSum: Valid
...1
```

Note – If the `fmh` command output does not show anything, you may have entered an incorrect memory address. Repeat the `tftp`, `erase` and `cp.b` commands (repeat from step 5) until the image is properly copied. Note that you *must* erase the existing firmware image before attempting to copy a new image.

---

9. Reset the ILOM service processor.

Once you are certain that the service processor firmware image has been recovered, you can restart the service processor with the U- boot `reset` command.

```
=> reset
```

The SP should boot correctly.

- If the SP doesn't boot correctly, but it gets to the `"Booting linux in 2 seconds..."` message, restart this procedure from the beginning.
- If it doesn't get as far as the `"Booting linux.."` message, contact your Sun representative.

10. **When the SP has booted all the way to the linux login prompt, log in with the following**

    `Username: sunservice`

    `Password: changeme`

    Remember, you will have lost all configuration data after performing the flash update.

11. **Restore the `/coredump` partition with this command:**

    `/usr/local/bin/`*`format_coredump`*

    The `format_coredump` program might be named something like: `format_coredump.galaxy.2M`, but there is only one such program in `/usr/local/bin`. Enter `ls /usr/local/bin` to see a list of programs and run whichever one is there.

12. **Recover the system BIOS.**

Note – This manual ILOM SP recovery process does *not* reflash the system BIOS. Repeat the firmware upgrade process, using the ILOM Web Interface or CLI procedures as described in "Flashing the ILOM/BIOS Firmware" on page 55.

---

13. **Reset your service processor and BIOS configuration settings as needed, because they might be lost during this recovery.**

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.