Oracle® Integrated Lights Out Manager (ILOM) 3.0

Supplement for the Sun Netra X4270 Server

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Using This Documentation

This supplement contains platform-specific information for using ILOM on the Sun Netra X4270 server from Oracle®. This guide is written for system installers and enterprise administrators who have experience installing similar systems.

This preface contains the following topics:

- "Related Documentation" on page v
- "Documentation, Support, and Training" on page vii
- "Documentation Feedback" on page vii

Related Documentation

The following tables list the Sun Netra X4270 server documentation and related documentation.

The documents listed as online are available at:

(http://docs.sun.com/app/docs/prod/nt4270.srvr#hic)

TABLE: Sun Netra X4270 Server Documentation

Application	Title	Part Number	Location
Late-breaking news	*Sun Netra X4270 Server Product Notes*	821-0577-*xx*	Online
Site planning	*Sun Netra X4270 Server Site Planning Guide*	821-0571-*xx*	Online
Getting started	*Sun Netra Rack Server Getting Started Guide*	820-3016-*xx*	Included in shipping kit
Installation	*Sun Netra X4270 Server Installation Guide*	821-0572-*xx*	Online
Service	*Sun Netra X4270 Server Service Manual*	821-0573-*xx*	Online
Remote management	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Netra X4270 Server*	821-0574-*xx*	Online

TABLE: Sun Netra X4270 Server Documentation *(Continued)*

Application	Title	Part Number	Location
Operating system installation	*Sun Netra X4270 Server Operating System Installation Guide*	821-0576-*xx*	Online
Safety and compliance	*Sun Netra X4270 Server Safety and Compliance Guide*	821-0575-*xx*	Online
Safety information	*Important Safety Information for Sun Hardware Systems*	816-7190-*xx*	Included in shipping kit

TABLE: ILOM 3.0 Documentation

Application	Title	Part Number	Location
Late-breaking news and issues	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Feature Updates and Release Notes*	820-7329-*xx*	Online
Installation and configuration	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Getting Started Guide*	820-5523-*xx*	Online
Conceptual information	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide*	820-6410-*xx*	Online
Browser interface procedures	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*	820-6411-*xx*	Online
CLI procedures	*Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide*	820-6412-*xx*	Online
SNMP and IPMI procedures	*Oracle Integrated Lights Out Manager (ILOM) 3.0 Management Protocols Reference Guide*	820-6413-*xx*	Online

TABLE: SAS Controller HBA and LSI 106x RAID Documentation

Application	Title	Part Number	Location
Disk management overview	*Sun Disk Management Overview*	820-6350-*xx*	Online
RAID management	*Sun LSI 106x RAID User's Guide*	820-4933-*xx*	Online
SAS HBA installation	*Sun StorageTek PCI Express SAS 8-Channel Internal HBA Installation Guide*	820-4932-*xx*	Online

TABLE: Diagnostics for x64 Servers

Application	Title	Part Number	Location
Diagnostics available for x64 servers	*Sun x64 Servers Diagnostics Guide*	820-6750-*xx*	Online

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (http://docs.sun.com)
- Support (http://www.sun.com/support)
- Training (http://www.sun.com/training)

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Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Netra X4270 Server, part number 821-0574-10.

Understanding Netra X4270 Server-Specific ILOM Features

These topics provide platform-specific information related to ILOM 3.0 running on the Netra X4270 server. ILOM 3.0 supports the same platform-specific features are supported for ILOM 2.0.

Note – The features described in this chapter are supported in addition to the common ILOM 3.0 features supported for all x64 servers.

- "ILOM Overview" on page 1
- "Understanding and Configuring ILOM Sideband Management" on page 2
- "Directing the Serial Port" on page 9
- "Identifying and Clearing Server Faults" on page 12
- "Controlling the Telco Alarm Port" on page 13
- "Monitoring Hardware and Environmental Sensors" on page 14

ILOM Overview

ILOM is system management firmware that is preinstalled on all x64-based servers. ILOM enables you to actively manage and monitor components installed in your server. ILOM provides a browser-based interface and a command-line interface, as well as SNMP and IPMI interfaces. For general information about ILOM's use and capabilities, see the ILOM documentation collection, available online at: `(http://docs.sun.com/app/docs/prod/int.lights.mgr30#hic)`

ILOM 3.0 operates on many hardware platforms, supporting features that are common to all platforms. Some ILOM 3.0 features belong to a subset of platforms and not to all. This supplement describes the features that are specific to the Netra X4270 server, augmenting the set of common features described in the ILOM 3.0 documentation.

"Understanding Netra X4270 Server-Specific ILOM Features" on page 1 of this supplement provides detailed information about the ILOM platform-specific features supported on the Netra X4270 server.

For information about establishing a first time connection to ILOM on your server's SP, see the *Sun Netra X4270 Server Installation Guide*.

The following table identifies the ILOM and BIOS firmware versions supported on the servers.

ILOM SP Version	Host BIOS Version	Applicable Hardware
3.0.9.x	07.06.02.15	Netra X4270 Server

The Netra X4270 Server supports the new features included in the 3.0.9 release of ILOM. For a detailed description of these new features, refer to the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Feature Updates and Release Notes* (820-7329).

Related Information

- "Understanding and Configuring ILOM Sideband Management" on page 2

Understanding and Configuring ILOM Sideband Management

These topics describe how to implement ILOM sideband management:

- "ILOM Sideband Management" on page 3
- "Configure Sideband Management (Web Interface)" on page 3
- "Configure Sideband Management (CLI)" on page 5
- "Configure Sideband Management (Host BIOS Setup Utility)" on page 6
- "Troubleshoot Connectivity Issues" on page 7

ILOM Sideband Management

By default, you connect to the server's SP using the out-of-band NET MGT port. The ILOM sideband management feature enables you to select either the NET MGT port or one of the server's Gigabit Ethernet ports (NET 0, 1, 2, 3), which are in-band ports, to send and receive ILOM commands to and from the server SP. In-band ports are also called *sideband* ports.

The advantage of using a sideband management port to manage the server's SP is that one less cable connection and one less network switch port is needed. In configurations where a great number of servers are being managed, such as data centers, sideband management can represent a significant savings in hardware and network utilization.

You can configure sideband management using either the web interface, the CLI, the BIOS, or IPMI.

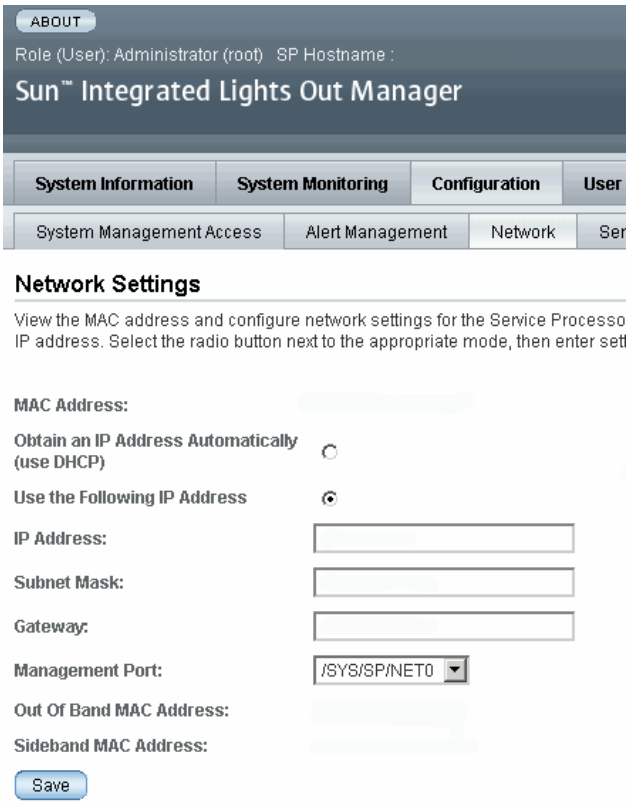
Related Information

- "Troubleshoot Connectivity Issues" on page 7
- "Configure Sideband Management (Web Interface)" on page 3
- "Configure Sideband Management (CLI)" on page 5
- "Configure Sideband Management (Host BIOS Setup Utility)" on page 6

▼ Configure Sideband Management (Web Interface)

1. **Log in to the ILOM web interface.**
2. **Select Configuration -> Network.**

   The Network Settings page is displayed.



3. **In the Network Settings page, do the following:**

   a. **Select DHCP to acquire the IP address automatically, or type the appropriate IP address.**

   b. **To select a sideband management port, click the Management Port drop-down list and select the desired management port.**

      The drop-down list enables you to change to any one of the four Gigabit Ethernet ports, `/SYS/MB/NET`*n*, where *n* is 0 to 3. The SP NET MGT port, `/SYS/SP/NET0`, is the default.

   c. **Click Save.**

Related Information

- "ILOM Sideband Management" on page 3

▼ Configure Sideband Management (CLI)

1. **Log in to ILOM using the CLI.**

Note – Using a serial connection for this procedure eliminates the possibility of losing connectivity during sideband management configuration changes.

---

2. **If you logged in using the serial port, you can assign a static IP address.**

   For instructions, see the section on changing the serial connection to change the ILOM SP IP address in the *Sun Netra X4270 Server Installation Guide*.

3. **To show the current port settings, type:**

   -> **show /SP/network**

   The network properties are displayed. For example:

```
/SP/network
    Targets:
    Properties:
        commitpending = (Cannot show property)
        dhcp_server_ip = none
        ipaddress = xx.xx.xx.xx
        ipdiscovery = static
        ipgateway = xx.xx.xx.xx
        ipnetmask = xx.xx.xx.xx
        macaddress = 11.11.11.11.11.86
        managementport = /SYS/SP/NET0
        outofbandmacaddress = 11.11.11.11.11.86
        pendingipaddress = xx.xx.xx.xx
        pendingipdiscovery = static
        pendingipgateway =  xx.xx.xx.xx
        pendingipnetmask =  xx.xx.xx.xx
        pendingmanagementport = /SYS/SP/NET0
        sidebandmacaddress = 11.11.11.11.11.87
        state = enabled
```

   In this example, the current active `macaddress` is the same as the SP's `outofbandmacaddress`, and the current active `managementport` is set to the default (`/SYS/SP/NET0`).

4. **To set the SP management port to a sideband port, type the following commands:**

   -> **set /SP/network pendingmanagementport=/SYS/MB/NET***n*

   Where *n* equals 0, 1, 2, or 3.

   -> **set commitpending=true**

5. **To view the change, type:**

   -> **show /SP/network**

   The network properties are displayed, showing that the change has taken effect. For example:

```
/SP/network
    Targets:
    Properties:
        commitpending = (Cannot show property)
        dhcp_server_ip = none
        ipaddress = xx.xx.xx.xx
        ipdiscovery = static
        ipgateway = xx.xx.xx.xx
        ipnetmask = xx.xx.xx.xx
        macaddress = 11.11.11.11.11.87
        managementport = /SYS/MB/NETn
        outofbandmacaddress = 11.11.11.11.11.86
        pendingipaddress = xx.xx.xx.xx
        pendingipdiscovery = static
        pendingipgateway =  xx.xx.xx.xx
        pendingipnetmask =  xx.xx.xx.xx
        pendingmanagementport = /SYS/MB/NETn
        sidebandmacaddress = 11.11.11.11.11.87
        state = enabled
```

   In this example, the `macaddress` matches the `sidebandmacaddress`, and the `managementport` matches the `pendingmanagementport`.

Related Information

- "ILOM Sideband Management" on page 3

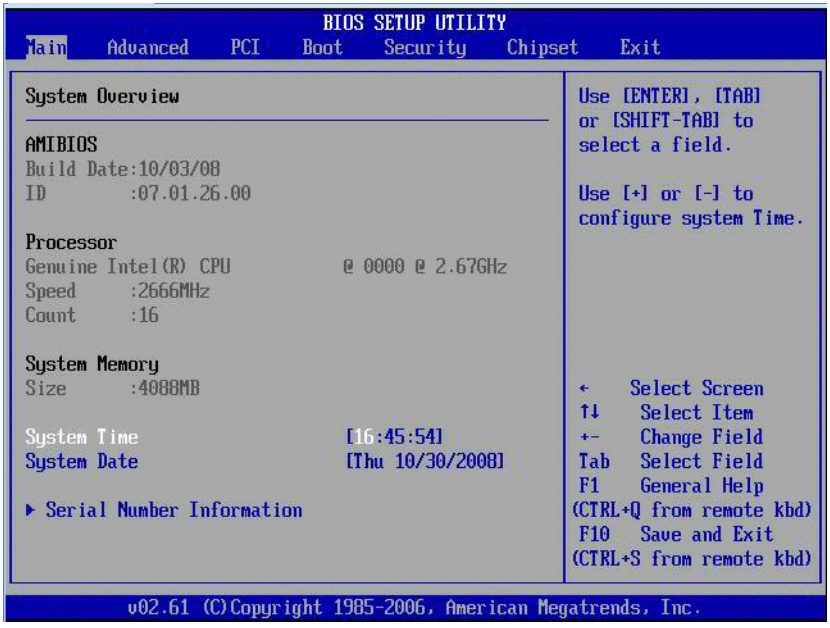
▼ Configure Sideband Management (Host BIOS Setup Utility)

1. **Access the BIOS Setup utility screens from one of the following interfaces:**
   - Use a USB keyboard, mouse, and VGA monitor connected directly to the server.
   - Use a terminal (or terminal emulator connected to a computer) through the serial port on the back panel of the server.
   - Connect to the server using the Oracle ILOM Remote Console.
2. **Power on or power cycle the server.**

3. **Press the F2 key while the system is performing POST to enter the BIOS Setup utility.**

```
Initializing USB Controllers .. Done.
Press F2 to run Setup (CTRL+E on Remote Keyboard)
Press F8 for BBS POPUP  (CTRL+P on Remote Keyboard)
Press F12 to boot from the network (CTRL+N on Remote Keyboard)
```

When BIOS starts, the main BIOS Setup utility top-level screen is displayed. This screen provides seven menu options across the top of the screen.



Related Information

- "ILOM Sideband Management" on page 3

▼ Troubleshoot Connectivity Issues

When sideband management is enabled in ILOM, the following conditions might occur:

- Connectivity to the server SP might be lost if the SP management port configuration is changed while you are connected to the SP through a network connection, such as SSH, web, or Oracle ILOM Remote Console.

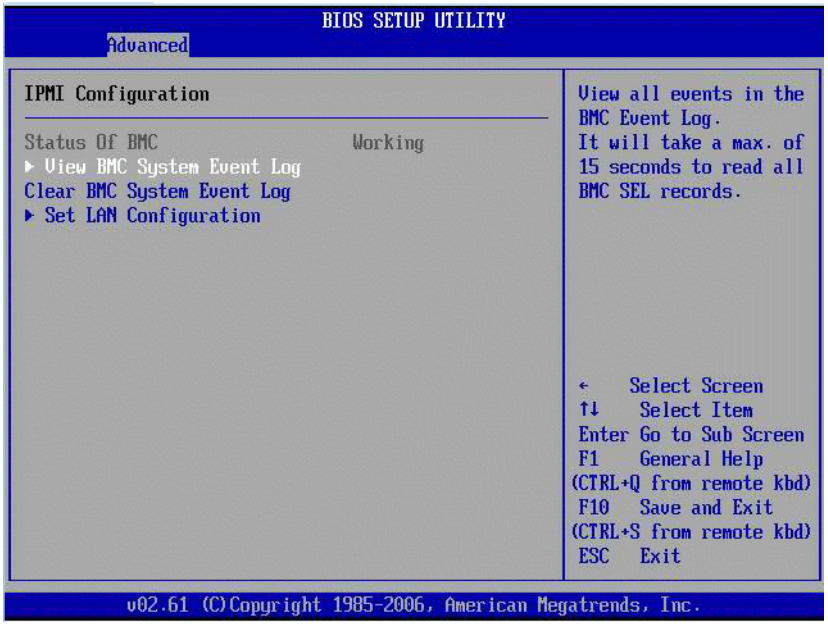
- In-chip connectivity between the SP and the host operating system might not be supported by the on-board host Gigabit Ethernet controller. If this condition occurs, use a different port or route to transmit traffic between the source and destination targets instead of using L2 bridging/switching.
- Server host power cycles might cause a brief interruption of network connectivity for server Gigabit Ethernet ports (NET 0, 1, 2, 3) that are configured for sideband management. If this condition occurs, configure the adjacent switch/bridge ports as host ports.

Note – If the ports are configured as switch ports and participate in the STP, you might experience longer outages due to spanning tree recalculation.

If these conditions occur, follow this procedure:

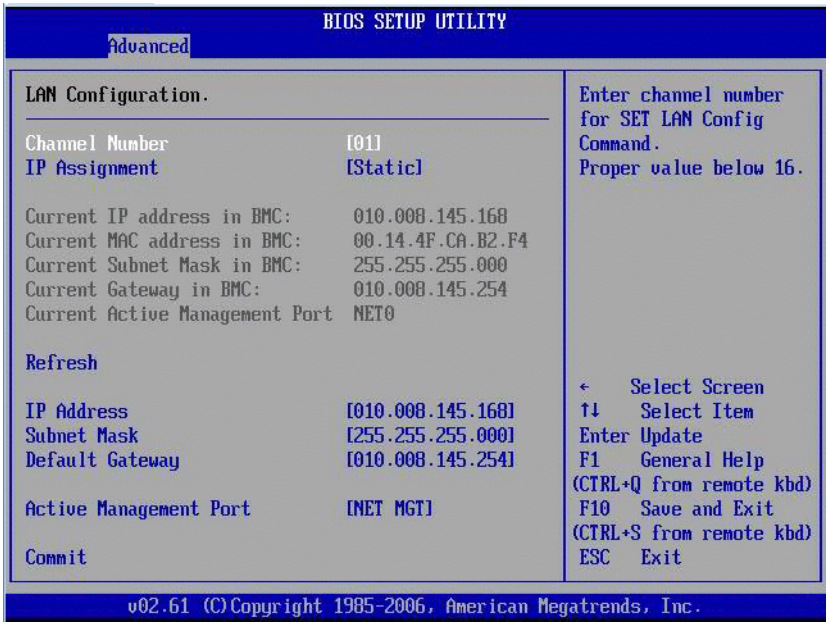
1. **In the main screen, select Advanced --> IPMI Configuration.**

   The IPMI Configuration screen is displayed.



2. **In the IPMI Configuration screen, select the Set LAN Configuration option.**

   The LAN Configuration screen is displayed.



3. **In the LAN Configuration screen, do the following:**

   a. **Use the left and right keys to select the IP Assignment option and set it to DHCP.**

   b. **Use the left and right keys to select the Active Management Port option and set the port to a sideband management port (NET0, NET1, NET2, NET3).**

      The NET MGT port is the default.

   c. **Select Commit for the change to take effect.**

Related Information

- "ILOM Sideband Management" on page 3

Directing the Serial Port

These topics describe how to direct the serial port output between the SP and the Host Console.

- "Serial Port Output Options" on page 10
- "Switch Serial Port Output (Web Interface)" on page 10

- "Switch Serial Port Output (CLI)" on page 11

Related Information

- "Understanding and Configuring ILOM Sideband Management" on page 2

Serial Port Output Options

You can switch the serial port output of the Netra X4270 server between the SP console (SER MGT) and the host console (COM1). By default, the SP console is connected to the system serial port. This feature is beneficial for Windows kernel debugging, as it enables you to view non-ASCII character traffic from the host console.

You can switch serial port output using either the ILOM web interface or the ILOM CLI. For instructions, see the following sections:

Caution – Set up the network on the SP before switching the serial port owner to the host server. If a network is not set up, and you switch the serial port owner to the host server, you will be unable to connect using the CLI or web interface to change the serial port owner back to the SP. To change the serial port owner back to the SP, you must use the ILOM Preboot Menu to restore access to the serial port over the network. For instructions, see the *Sun Netra X4270 Server Service Manual*.

Related Information

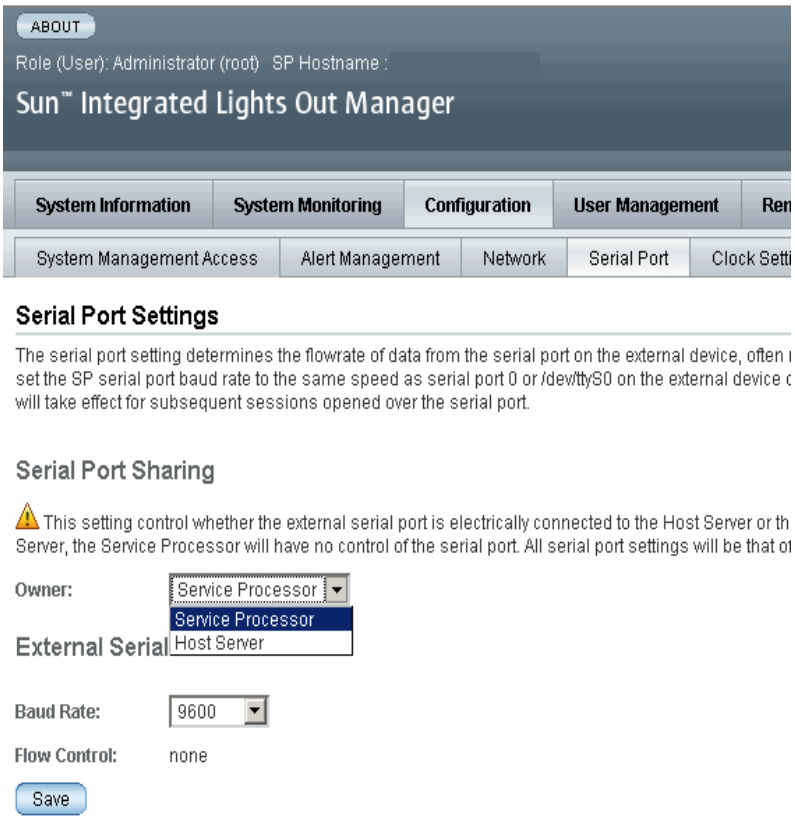
- "Switch Serial Port Output (Web Interface)" on page 10
- "Switch Serial Port Output (CLI)" on page 11

▼ Switch Serial Port Output (Web Interface)

To switch the serial port output using the ILOM web interface, perform the following steps:

1. **Log in to the ILOM web interface.**
2. **In the ILOM web interface, click Configuration --> Serial Port.**

   The Serial Port Settings page is displayed.



3. **To select a serial port owner, click the Owner drop-down list and select the desired serial port owner.**

   You can select either `Service Processor` or `Host Server` from the drop-down list.

   By default, `Service Processor` is selected.

4. **Click Save.**

Related Information

- "Switch Serial Port Output (CLI)" on page 11
- "Serial Port Output Options" on page 10

▼ Switch Serial Port Output (CLI)

1. **Log in to the ILOM CLI.**

2. **To set the serial port owner, type:**

   -> **set /SP/serial/portsharing/owner=host**

   The default is `owner=SP`.

Related Information

- "Switch Serial Port Output (Web Interface)" on page 10
- "Serial Port Output Options" on page 10

Identifying and Clearing Server Faults

These topics describe how and when to clear system faults using ILOM:

- "Identify Faults" on page 12
- "Clear Faults" on page 13

Identify Faults

When a server component fails, the server generates a component-specific fault that is captured by the ILOM SP. Some faults are cleared automatically when the failed component is replaced, but faults generated for components that are *not* hot-serviceable have to be cleared manually. You can use either the ILOM web interface or the CLI to manually clear faults.

For the Netra X4270, the following types of faults must be cleared manually after the faulty component is replaced:

- DIMM faults
- CPU faults
- Motherboard faults (when motherboard is not replaced)
- PCIe faults

Related Information

- "Clear Faults" on page 13
- *Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide*
- *Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*

Clear Faults

To clear DIMM, CPU, motherboard, and PCIe faults, access the server's ILOM SP and clear the fault for the failed component. Note the following:

- When clearing faults for memory DIMMs, note that the DIMM faults can be either system wide (`/SYS/MB`) or on a per DIMM basis (`/SYS/MB/P`*n*`/D`*n*).
- PCIe faults can cover one or more of the following components: `/SYS/MB/NET`*n* and `/SYS/MB/RISER`*n*`/PCIE`*n*.

Related Information

- "Identify Faults" on page 12
- *Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide*
- *Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*

Controlling the Telco Alarm Port

These topics describe how ILOM alarms work and how to contoll them:

- "ILOM Alarm LEDs in a Telco Environment" on page 13
- "Set an Alarm Indicator On or Off (CLI)" on page 14

ILOM Alarm LEDs in a Telco Environment

When an ILOM alarm is asserted, the proper LED is turned on, and the corresponding alarm signals are sent to the alarm port on the rear panel. When an alarm is turned off, the LED is turned off and the alarm port signal is reset.

You can manage the alarm indicators by using the ILOM CLI or web interface, or by using the the IPMItool utility. Setting an alarm indicator to ON enables the corresponding alarm on the rear panel alarm port and the front panel alarm LED.

In a telecommunications environment, the alarm port connects to the central office alarming system.

Note – See the *Sun Netra X4270 Server Service Manual* for alarm connector pinouts and signals.

Related Information

- "Set an Alarm Indicator On or Off (CLI)" on page 14

▼ Set an Alarm Indicator On or Off (CLI)

- ***At the -> prompt, type one of the following commands:**

```
-> set /SYS/CRITICAL_ALARM value=state
-> set /SYS/ALARM/MAJOR value=state
-> set /SYS/ALARm/MINOR value=state
-> set /SYS/ALARM/USER value=state
```

where *state* is `on` or `off`.

Related Information

- "Clear Faults" on page 13

Monitoring Hardware and Environmental Sensors

The server includes several sensors that report on hardware conditions. You use the sensor readings to adjust the fan speeds and perform other actions, such as illuminating LEDs and powering off the server.

These topics describe the sensors that ILOM monitors for the Netra X4270 server.

- "Temperature Sensors" on page 15
- "Power Supply Fault Sensors" on page 15
- "Fan Sensors" on page 16
- "Power Supply Unit Current, Voltage, and Power Sensors" on page 16
- "Entity Presence Sensors" on page 17

Related Information

- *Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide*
- *Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*

Temperature Sensors

Sensor Name	Description	Location
/SYS/MB/PCI_MEZZ/T_AMB	PCI mezannine ambient temperature sensor	Front end of the motherboard directly behind the storage drives
/SYS/MB/T_OUT0 /SYS/MB/T_OUT1 /SYS/MB/T_OUT2	Motherboard temperature sensors	Back end of the motherboard
/SYS/PDB/T_AMB	Power distribution board ambient temperature sensor	Power distribution board
/SYS/PS0/T_AMB	Power Supply 0 ambient temperature sensor	Power Supply 0
/SYS/PS1/T_AMB	Power Supply 1 ambient temperature sensor	Power Supply 1

Related Information

- "Power Supply Fault Sensors" on page 15
- "Fan Sensors" on page 16
- "Power Supply Unit Current, Voltage, and Power Sensors" on page 16
- "Entity Presence Sensors" on page 17

Power Supply Fault Sensors

n designates the numbers 0 or 1.

Sensor Name	Sensor Type	Description
/SYS/PS*n*/PWROK	Fault	Power supply *n* DC power OK
/SYS/PS*n*/VINOK	Fault	Power supply *n* input voltage OK
/SYS/PS*n*/CUR_FAULT	Fault	Power supply *n* current fault
/SYS/PS*n*/VOLT_FAULT	Fault	Power supply *n* voltage fault
/SYS/PS*n*/FAN_FAULT	Fault	Power supply *n* fan fault
/SYS/PS*n*/TEMP_FAULT	Fault	Power supply *n* temperature fault

Related Information

- "Temperature Sensors" on page 15
- "Fan Sensors" on page 16
- "Power Supply Unit Current, Voltage, and Power Sensors" on page 16
- "Entity Presence Sensors" on page 17

Fan Sensors

n designates numbers 0, 1, 2, and so on.

Sensor Name	Sensor Type	Description
/SYS/FT*x*/F*x*/TACH	Fan speed	Fan tray *x*; Fan *x* tachometer

Related Information

- "Temperature Sensors" on page 15
- "Power Supply Fault Sensors" on page 15
- "Power Supply Unit Current, Voltage, and Power Sensors" on page 16
- "Entity Presence Sensors" on page 17

Power Supply Unit Current, Voltage, and Power Sensors

n designates numbers 0-1.

Sensor Name	Sensor Type	Description
/SYS/PS*n*/V_IN	Voltage	Power supply unit *n* AC input voltage sensor
/SYS/PS*n*/I_IN	Current	Power supply unit *n* AC input current sensor
/SYS/PS*n*/V_OUT	Voltage	Power supply unit *n* DC output voltage sensor
/SYS/PS*n*/I_OUT	Current	Power supply unit *n* DC output current sensor
/SYS/PS*n*/INPUT_POWER	Power	Power supply unit *n* input power sensor

Sensor Name	Sensor Type	Description
/SYS/PS*n*/OUTPUT_POWER	Power	Power supply unit *n* output power sensor
/SYS/VPS	Power	Server total input power consumption sensor

Related Information

- "Temperature Sensors" on page 15
- "Power Supply Fault Sensors" on page 15
- "Fan Sensors" on page 16
- "Entity Presence Sensors" on page 17

Entity Presence Sensors

n designates numbers 0 to n.

Sensor Name	Sensor Type	Description
/SYS/HDD*n*/PRSNT	Entity presence	Hard drive device present monitor
/SYS/DBP/PRSNT	Entity presence	Disk backplane present monitor
/SYS/MB/P*n*/PRSNT	Entity presence	Motherboard; CPU*n* present monitor
/SYS/MB/P*n*/D*n*/PRSNT	Entity presence	Motherboard; CPU*n*; Memory DIMM *n* present monitor
/SYS/MB/PCI_MEZZ/PCIEx/PRSNT	Entity presence	PCIe card n present monitor
/SYS/MB/RISER*n*/PRSNT	Entity presence	PCIe card *n* present monitor
/SYS/PS*n*/PRSNT	Entity presence	Power supply *n* present monitor

Related Information

- "Temperature Sensors" on page 15
- "Power Supply Fault Sensors" on page 15
- "Fan Sensors" on page 16
- "Power Supply Unit Current, Voltage, and Power Sensors" on page 16

Glossary

Numerics

2U two rack units (3.5 in./89 mm).

A

ACPI advanced configuration and power interface.

AWG American wire gauge.

B

BIOS basic input/output system.

BMC baseboard management controller.

C

CLI command-line interface.

CMA cable management arm, used to route and secure cables extending from the rear of the system.

CMOS complementary metal-oxide semiconductor. Refers to the memory used to store BIOS settings.

CTS clear to send.

D

DB-15 15-pin d-subminiature connector.

DDR3 SDRAM double-data rate three synchronous dynamic random access memory.

DHCP Dynamic Host Configuration Protocol.

DIMM dual in-line memory module.

DR dual-rank DIMM.

E

ECC error correction code.

EMI electromagnetic interference.

ESD electrostatic discharge.

ESM energy storage module.

G

GRUB GNU grand unified bootloader. An open source boot loader.

H

HBA host bus adapter.

I

ILOM Oracle Integrated Lights Out Manager. Firmware that enables you to manage the system even when system is shut down.

IM integrated mirror.

IME integrated mirror enhanced array.

IPMI intelligent platform management interface.

IS integrated striping array.

J

JBOD just a bunch of disks.

K

KBC BAT keyboard controller basic assurance test.

L

LED light-emitting diode.

LSF Low smoke fume.

M

MPS multiprocessor specification.

N

NEBS Network Equipment-Building Standards. Defined standards for equipment to be installed in a telecommunications central office. Telecordia maintains these standards and tests equipment for NEBS certification.

NET MGT network management port. After connecting a network cable to this NET MGT port, you can configure the system ILOM SP through this port.

NIC network interface card.

NTP network time protocol.

NVRAM non-volatile random access memory.

O

OS operating system.

OSP outside plant.

P

PCIe2 peripheral component interconnect express 2.0. Refers to cards or slots that support the PCI Express 2.0 specification.

PDB power distribution board.

POST power-on self-test.

PSH predictive self-healing.

PSU power supply unit.

PXE preboot execution environment.

Q

QR DIMM quad-rank DIMM.

R

RAID redundant array of independent disks.

RAS Reliability, Availability, and Serviceability.

RIS remote installation services.

RPM rotations per minute.

RTS request to send.

S

SAS serial attached SCSI.

SATA serial advanced technology attachment.

SCSI small computer system interface.

SER MGT serial management port. The default port for system management, especially during the initial system configuration.

SFF small form factor.

S.M.A.R.T. self-monitoring, analysis, and reporting technology.

SP service processor.

SR DIMM single-rank DIMM.

SSH secure shell.

STP shielded twisted pair.

T

TCG Trusted Computing Group.

TPM trusted platform module. For more information, refer to the Microsoft Windows Trusted Platform Module Management documentation.

U

USB universal serial bus.

US NEC United States National Electrical Code. A United States standard for the installation of electrical wiring and equipment.

V

VAC volts of alternating current.

VDC volts of direct (continuous) current.

VGA video graphics array.

VT-d virtualization technology for directed I/O.

W

WDT watchdog timers.

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