Sun Blade™ X6275 Server Module Diagnostics Guide

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Contents

Preface

The *Sun Blade X6275 Server Module Diagnostics Guide* describes the diagnostic information that you can obtain for this server module, and contains information and procedures for troubleshooting problems with the servers.

Related Documents

To see a list of the Sun Blade™ X6275 server module documentation, refer to the *Getting Started Guide* that is packed with your system and also posted at the product's documentation site.

Translated versions of some of these documents are available at the web product documentation page in Simplified Chinese, French, and Japanese. English documentation is revised more frequently and might be more up-to-date than the translated documentation. See TABLE P-1 for more information.

Sun Online

TABLE P-1   Sun Online Pages

Sun Function	URL	Description
Sun Documentation	http://docs.sun.com	You can navigate to the Sun Blade X6275 server module document page and then download PDF and view HTML documents.
Support	http://www.sun.com/support/	Obtain technical support and download patches.
Training	http://www.sun.com/training/	Learn about Sun training courses.
Warranty	http://www.sun.com/service/warranty/index.jsp	Obtain specific details regarding your warranty.
Feedback	http://www.sun.com/hwdocs/feedback/	Submit your comments. Please include the title and part number of your document with your feedback: *Sun Blade X6275 Server Module Diagnostics Guide*, part number 820-6850-11
Product Updates	http://www.sun.com/download/	Find the Hardware Drivers section and click x64 Servers & Workstations. The Sun Blade X6275 server module site contains updates for firmware, drivers, and DVD/CD-ROM ISO images.

Introduction

The X6275 Server Module offers a variety of components and utilities to help you monitor the health of your server blade and diagnose problems should they arise. This chapter covers the following subjects:

Troubleshooting

Your options for troubleshooting a server node, are, in approximate order:

TABLE 2-1   Troubleshooting Tasks and Instructions

Order	Task	Instructions
1	Watch the system BIOS power-on self-test results while booting the server node.	"How BIOS POST Memory Testing Works" on page 92
2	Obtain the ILOM Fault Management information, if any.	"Viewing Faults" on page 49
3	Examine the system event log with ILOM.	"To View the System Event Log With the ILOM Web Interface" on page 52 or "To View the System Event Log With the ILOM CLI" on page 53) or with IPMItool: "Viewing the SEL With IPMItool" on page 85).
4	View the sensor status with ILOM.	"Monitoring Status Using the ILOM Web Interface" on page 42) or with IPMItool: "Reading Sensor Status" on page 80).
5	Run Pc-Check in Manual mode.	"Running Pc-Check Diagnostics" on page 60
6	Use ILOM's Data Collector function to create a "snapshot" of the server node that you can send to Sun Services for diagnosis.	ILOM 2.0: "Data Collection Snapshot" on page 33 ILOM 3.0: "Data Collection Snapshot" on page 54

Monitoring

Continuous Monitoring

You can set up your system to generate SNMP traps with Integrated Lights Out Manager (ILOM). For more information, refer to the *Sun Integrated Lights Out Manager (ILOM) 3.0 SNMP and IPMI Procedures Guide (820-6413)*.

You can also set up your system to generate SNMP traps with IPMItool. Refer to the IPMItool documentation available at:

http://ipmitool.sourceforge.net/

If you enable Pc-Check for a given server node, the Pc-Check diagnostic tests are run every time the server boots (which adds about 3 minutes to boot time). The test results are stored in the SP's memory, where you or your Sun service personnel can access them and use for diagnostic evaluation if your server has problems.

Occasional Monitoring

You can log in to a chassis Chassis Monitoring Module (CMM) or an individual server node with the ILOM web and CLI interfaces. See "Monitoring the Server Node With ILOM 3.0" on page 42.

Note – If you want to use ILOM to monitor several servers, it is faster to log in to the CMM and use the Chassis View to move from server node to server node.

With IPMItool, you can obtain information about multiple servers at one time by using IPMItool commands with multiple target IP addresses.

X6275 Server Module Diagnostic Tools

Service Processor

Each server node on the X6275 server module has its own dedicated service processor (SP) that monitors the server node. Whenever the SP is rebooted, it runs a diagnostic program on itself, so that you can diagnose any problems that it might have. This is covered in "The Service Processor" on page 9.

ILOM

The SP runs software called the Integrated Lights Out Manager (ILOM), which is the focal point for most of the server node monitoring and diagnosis that you might do manually, that might be done automatically, or by your Sun Service personnel when he is assisting you.

The ILOM software is accessible both from a browser interface and from a command-line interface. It is covered in "ILOM 2.0 Diagnostic Tools" on page 15 and "ILOM 3.0 Diagnostic Tools" on page 37.

Pc-Check

Pc-Check is a diagnostics program that can test and detect problems on all motherboard components, drives, ports, and slots. This program can be accessed and executed from ILOM.

You can run Pc-Check manually or you can choose to have it run automatically every time your server node reboots. When it is run manually, you see the results yourself. When it is run automatically, the results are stored on the SP where Sun Services can access them.

Pc-Check is covered in "Performing Pc-Check Diagnostic Tests" on page 59.

IPMItool

IPMItool is included on the X6275 blade's Tools and Drivers CD image.

IPMItool enables you to monitor and manage a number of server modules simultaneously over a LAN. You can also generate IPMI-specific traps.

IPMItool is covered in "Using IPMItool to View System Information" on page 77.

Power-On Self-Test

The system BIOS provides a basic power-on self-test (POST), during which the BIOS checks the basic devices required for the server to operate. Using BIOS POST testing is covered in "BIOS Power-On Self-Test (POST) Codes" on page 91.

Commonly Used Terms

The following table identifies terms commonly used in this document.

TABLE 2-2   Commonly Used Terms

Term	Definition
Server blade, blade	The X6275 Blade Server Module, which is the physical blade that plugs into a Sun modular system chassis. The X6275 blade server contains two x64 independent nodes.
Node	Either of the two x64 computers resident on the server blade.
Host, Server, Server node	Other names used for nodes.
Service Processor (SP)	The SP is a "baseboard management controller" (BMC). Each of the two servers on the server blade has its own dedicated SP.
ILOM	The Integrated Lights Out Manager software that runs on the SP.
Chassis Management Module (CMM)	A baseboard management controller for the entire Sun modular system chassis.
CMM ILOM	The Integrated Lights Out Manager software that runs on the CMM.

The Service Processor

The key to obtaining diagnostic information for an X6275 Blade Server Module node is its service processor (SO), an independent processor located on a daughter board in the blade.

This chapter includes the following topics:

- "The Service Processor" on page 9
- "Service Processor Diagnostics" on page 11

The Service Processor

Your server's SP is a "baseboard management controller" (BMC). A definition of a BMC might be:

"A baseboard management controller (BMC) is a specialized processor that monitors the physical state of a server using sensors and communicates with the system administrator through a special management connection. The BMC, part of the Intelligent Platform Management Interface (IPMI), is usually mounted on the motherboard of the server that it monitors."

Each of the two nodes of an X6275 Blade Server Module includes an SP, which runs whenever the server blade is inserted in a powered-on chassis, irrespective of whether or not the node itself is powered on. The SP runs software called the Integrated Lights Out Manager (ILOM), aptly named because the SP and the ILOM program run continuously whenever power is appliedto the server.

ILOM

The ILOM program that runs on each server's SP is the focal point for all of your diagnostic capability. With the ILOM program that runs on your server's SP you can:

- Monitor the server's sensors.
- View event logs.
- Be apprised of server faults.
- Set up diagnostic testing using Pc-Check.
- Collect performance and fault information with ILOM's Data Collection capability, which sends a "snapshot" of your server's health to Sun Services for diagnosis.
- Log in to and operate your server with a remote terminal using redirection. Using redirection you can, for example:
  - Reboot the server.
  - Change BIOS settings.
  - Observe the Power-On Self-Test (POST) results when booting.
  - Run scripts at the command-line.
  - Mount devices such as CD-ROM/CD-ROM image.

ILOM has both a web interface and a command-line interface.

IPMItool

You can use IPMItool to interrogate your server's sensors and view system information without using the ILOM program, but IPMItool requires a functioning SP to gather data.

SP Failure

If either of the two service processors on your server blade fails, the SP attempts to reboot itself (just the SP, not the server). If the SP cannot reboot, then it is likely due to a corrupted firmware image. You must recover the image by flashing the firmware image. See *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) or *Sun Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide* (820-6412).

Ccorrupted firmware on the host might cause the host to cease to operate. However, because the server and the SP operate independently of one another, a failed SP does not cause its host server to stop.

The only evidence of a failed SP is that ILOM ceases to work. This means that all of your diagnostic capabilities, including IPMItool, are disabled.

If you have determined that the SP has failed, you must replace the entire server blade as soon as you deem it appropriate.

Note – Diagnosing why your SP has failed might be of interest to Sun Services, but there is no need for you to attempt such a diagnosis.

Service Processor Diagnostics

The SP has its own diagnostics program that runs when it boots. This program is called U-Boot Diagnostics and is analogous to the Power-On Self-Test (POST) that runs when you boot a server.

You can observe the output of the U-Boot Diagnostics program through the serial console when you first put your server into service (at times when you suspect that the SP may have been damaged in shipping). You can also observe the output at any time by rebooting the SP.

The U-Boot Diagnostics Program

Every time your X6275 server blade's SP is booted or rebooted, the U-Boot Diagnostics program runs immediately on the SP. It collects data about the functional state of the SP and its components. It also obtains some information about the host. The resulting data is sent to two places:

- Nonvolatile memory on the SP. (Contact your Sun representative if you need to access this data.)
- The SP's serial port.

You can view the results yourself by connecting a terminal directly to the SP's serial port and watching the SP boot.

Note – Even if the program finds a fault, the SP still boots if it can. SP faults that arise during booting are not reported to ILOM Fault Management and do not turn on the Service Required LED, although they do get written to the ILOM's System Event Log (SEL).

▼ To Reboot the SP Using the ILOM Web Interface

1. **Log in to the SP web interface (see** "To Log In to the SP ILOM Web Interface Directly" on page 40**).**

2. **Select the Maintenance tab.**

3. **Select the Reset SP tab.**

4. **Click the Reset SP button.**

▼ To Reboot the SP Using the ILOM CLI

1. **Log in to the SP CLI (see** "To Log In to the SP ILOM CLI Directly" on page 40**).**

2. **Type `reset /SP` and press Enter.**

3. **The question appears, Are you sure you want to reset the /SP (y/n)? Type `y`.**

Running the U-Boot Diagnostic Software Without User Intervention

When the SP reboots, the U-Boot Diagnostics program runs immediately, whether or not you are connected to the SP's serial port.

Without your intervention, the program runs in its default mode (Normal mode).

You can connect a terminal to the SP's serial port so that you can see the program's output. As long as you do not interact with the program, it runs in Normal mode just as it would if you were not connected.

Running the U-Boot Diagnostic Software With User Intervention

You must connect to the SP's serial port with a terminal if you want to intervene in the running of the U-Boot Diagnostics program.

When you are connected to the serial port, you can see the test results, and you can force the U-boot diagnostics program to run in one of two alternate modes: Quick mode or Extended mode. Both of these modes perform more diagnostics than the Normal mode.

As the SP is booting, you see this prompt:

```
Enter Diagnostics Mode
['q'uick/'n'ormal(default)/e'x'tended(manufacturing mode]......0
```

- Type **n** or wait for the countdown to enable the default Normal mode.
- Type **q** to enable the Quick mode.
- Type **x** to enable the Extended mode.

Sample Output From Normal Mode Test

```
Diagnostic Mode - NORMAL
<DIAGS> Memory Data Bus Test ... PASSED
<DIAGS> Memory Address Bus Test ... PASSED
I2C Probe Test - Motherboard
         Bus     Device                    Address     Result
         ===     ================          =======     ======
         2       Sys FRUID ( U22)          0xA0        PASSED
         2       Power CPLD ( U40)         0x4e        PASSED
         2       CPU/DIMM Fault LEDs ( U78) 0x40       PASSED
         2       PCA9555 (Misc) ( U79)     0x42        PASSED
         2       LM75 Temp. Sensor 0 ( U18) 0x90       PASSED
         2       LM75 Temp. Sensor 1 ( U128) 0x92      PASSED
         2       LTC4215 ( U80)            0x96        PASSED
         2       DIMM IMAX ( U88)          0x12        PASSED
         6       Front Panel LEDs ( U100)  0xC6        PASSED
         6       DS1338(RTC) ( U79)        0xD0        PASSED
         6       PCA9555(Volt Marg) ( U84) 0x44        PASSED
<DIAGS> PHY #0 R/W Test ... PASSED
<DIAGS> PHY #0 Link Status ... PASSED
<DIAGS> ETHERNET PHY #0, Internal Loopback Test ... PASSED
Host in ON, Skipping HOST-based tests
<DIAGS> Testing PowerCPLD version ... PASSED
```

Note – Refer to the *Sun x64 Servers Diagnostics Guide* for more information on the Quick and Extended modes, including sample output.

ILOM 2.0 Diagnostic Tools

The ILOM 2.0 software running on your service processor (SP) has a complete suite of diagnostic capabilities. You can view event logs, the state of the sensors on the server node, and a list of critical faults, if any.

This chapter includes the following topics:

Accessing the SP

Prerequisites

At minimum, you need to know the IP address of the Chassis Monitoring Module (CMM). Refer to the *Sun Integrated Lights Out Manager User's Guide* for a procedure to obtain the CMM IP address.

After you have obtained the IP address of the CMM, you can obtain the IP address of the SP. The next topic describes a procedure for obtaining the SP IP address through the CMM ILOM web interface. Refer to *Sun Blade X6275 Server Module Installation Guide* for a procedure using the ILOM CLI.

Choose one of the following methods to log in to the SP:

After you have obtained the IP address of the CMM, you can obtain the IP address of the SP. The next topic describes a procedure for obtaining the SP IP address through the CMM ILOM web interface. Refer to Chapter 3 of the *Sun Blade X6275 Server Module Installation Guide* for a procedure using the ILOM CLI.

▼ To Log In to the SP Through the CMM ILOM Web Interface

1. **Open a browser and type `http://`<*CMM IP address*>**

   The CMM ILOM welcome screen opens.

2. **Enter `root` as your username and `changeme` as your password (unless you have previously changed your password).**

   The Chassis View appears in the ILOM web interface, as shown here.

FIGURE 4-1   ILOM 2.0 GUI: Chassis View
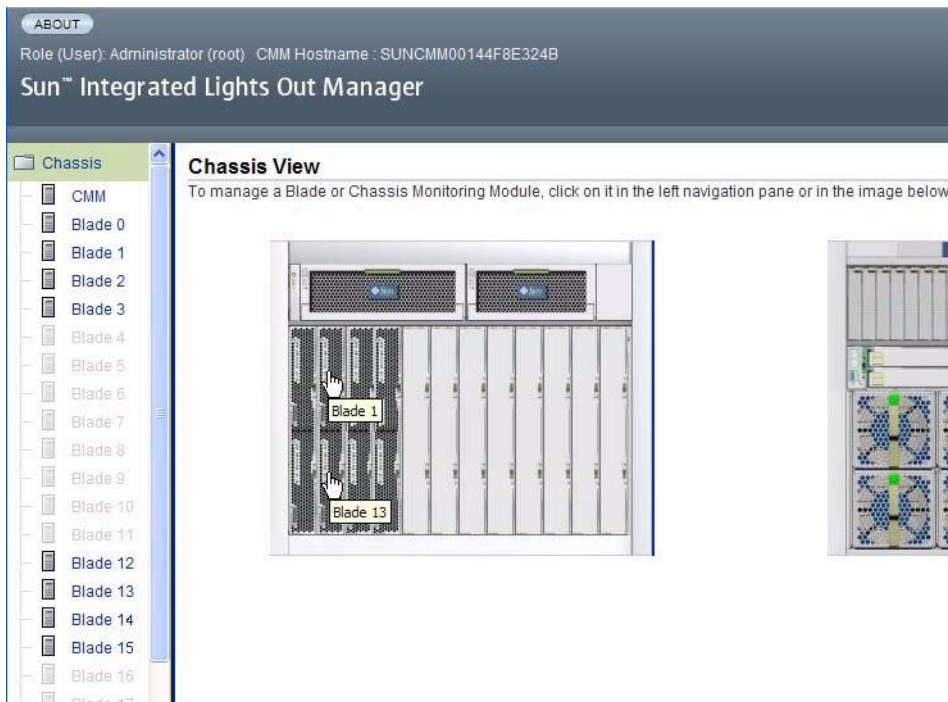
Note – The upper nodes (node 0) in each blade are numbered from 0-11. Node 1 in each blade has the same number as node 0 plus 12. For example, the nodes in the second blade from the left are numbered 1 (node 0) and 13 (node 1).

3. **To log in to the SP for a node, click on the node's name in the left navigation pane or in the image in the right pane.**

   The home page (System Information tab) for the node appears in the ILOM web interface:

FIGURE 4-2   ILOM 2.0 GUI: System Information > Versions View

Note – When you are logged in to the SP through the CMM ILOM web interface, you can obtain the IP address of the SP by selecting the Configuration tab and then the Network tab.

▼ To Log In to the SP ILOM Web Interface Directly

1. Open a browser and type `http://<`*SP IP address*`>`

The SP ILOM welcome screen opens.

2. Enter `root` as your username and `changeme` as your password (unless you have previously changed your password).

The ILOM web interface presents the home page (System Information tab) for the node.

▼ To Log In to the SP CLI Through the CMM ILOM CLI

1. Open a terminal and type `ssh root@<`*CMM IP address*`>`

2. Enter `changeme` as your password (unless you have previously changed your password).

You are logged in to the CMM CLI. The CLI prompt appears:

–>

3. To log in to the CLI for blade 6, for example, enter this command:

–> **`start /CH/BL6/SP/cli`**

You are logged in to the CLI for both the node and its SP. The CLI prompt appears:

–>

4. Change directories to the host or to the SP:

To change directories to the host, type:

`cd /SYS`

To change directories to the SP, type:

`cd /SP`

▼ To Log In to the SP ILOM CLI Directly

1. Open a terminal and type:

–>**`ssh root@`**`SP_IP_address`

2. **Enter `changeme` as your password (unless you have previously changed your password).**

   You are logged in to the CLI for both the node and its SP. The CLI prompt appears:

   `->`

3. **Change directories to the host or to the SP:**

   To change directories to the host, type:

   `cd /SYS`

   To change directories to the SP, type:

   `cd /SP`

Monitoring the Server Node With ILOM

Choose one of the following methods for monitoring your node with ILOM:

- "Monitoring Status Using the ILOM Web Interface" on page 19
- "Monitoring Status Using the ILOM CLI" on page 21

Monitoring Status Using the ILOM Web Interface

You can use the System Information and System Monitoring views of the ILOM web interface to monitor the status of the server module and its components.

▼ To Monitor Status Using the ILOM Web Interface

1. **Access a web browser.**

2. **Log in to the web interface. See one of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 16

   "To Log In to the SP ILOM Web Interface Directly" on page 18

   The System Information view opens.

3. **Select the submenu screens to view system and component information.**

TABLE 4-1 lists the System Information submenu tab functions.

TABLE 4-1   The ILOM System Information Tab Submenu Screens and Tasks

System Monitoring Tab	Tasks
Versions	View server board and SP versions.
Session Time-Out	Select an inactivity time-out for your session.
Components	View information about all the components that are present.
Fault Management	See "Fault Management" on page 25.
Identification Information	Change the SP identification information, such as host name and address.

Refer to the *Integrated Lights Out Manager Administration Guide* for more information about the System Information tab.

4. **Click the System Monitoring tab.**

The System Monitoring submenu screens appear.

TABLE 4-2 lists the submenu tabs and tasks.

TABLE 4-2   The ILOM System Monitoring Tab Submenu Screens

System Monitoring Tab	Tasks
Sensors Reading	View the name, type and readings of sensors.
Indicators	View the name and status of the LEDs. Shows both front-panel and internal LEDs.
Event Logs	View events, including details such as event ID, class, type, severity, date and time, and description of event.
Power Management	View actual, permitted, and available power.

Refer to the *Integrated Lights Out Manager Administration Guide,* for more information about the System Monitoring tab.

Monitoring Status Using the ILOM CLI

You can use the ILOM CLI to monitor the server module status and the status of its components

▼ To Monitor Status Using the ILOM CLI

1. **Open a terminal.**

2. **Log in to the CLI. See one of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 18

   "To Log In to the SP ILOM CLI Directly" on page 18).

   The CLI prompt appears:

   ```
   ->
   ```

3. **Navigate to the** `/SYS` **namespace.**

4. Use the CLI `cd` **(change directory) command to navigate to individual components listed below:**

Component Name	Type
/SYS	Host system
/SYS/SP	Service Processor
/SYS/SP/NET0	Network interface
/SYS/MB	Motherboard
/SYS/MB/P0	Host processor
/SYS/MB/P0/D1	DIMM
/SYS/MB/P0/D3	DIMM
/SYS/MB/P0/D5	DIMM
/SYS/MB/BIOS	BIOS
/SYS/MB/CPLD	NVRAM
/SYS/MB/NET0	Network interface
/SYS/MIDPLANE	Chassis
/SYS/PS1	Power supply
/SYS/NEM1	Network module
/SYS/CMM	Chassis Monitoring Module

5. **For example, from the** `/SYS` **namespace, enter** `cd MB/P0/D1` **to look at DIMM 1 of processor 0.**

You see the following:

FIGURE 4-3   `show` Command on a DIMM

```
/SYS/MB/P0/D1

-> show

 /SYS/MB/P0/D1
    Targets:
        SERVICE
        PRSNT

    Properties:
        type = DIMM
        fru_name = 2GB DDR3 SDRAM 533
        fru_manufacturer = Micron Technology
        fru_version = 4431
        fru_part_number = 18JSF25672PY-1G1D1
        fru_serial_number = EA1A9053
        fault_state = OK
        clear_fault_action = (none)

    Commands:
        cd
        show

->
```

Here are other examples:

show Command on Processor 0

```
-> cd SYS/MB/P0
/SYS/MB/P0

-> show

 /SYS/MB/P0
    Targets:
        D1
        D3
        D5
        SERVICE
        PRSNT

    Properties:
        type = Host Processor
        fru_name = Intel(R) Xeon(R) CPU              X5560  @ 2.80GHz
        fru_manufacturer = Intel
        fru_version = 04
        fru_part_number = 060A
        fault_state = OK
        clear_fault_action = (none)

    Commands:
        cd
        show

->
```

FIGURE 4-5   `show` Command on the Motherboard

```
-> cd SYS/MB
/SYS/MB

-> show

 /SYS/MB
    Targets:
        P0
        T_AMB_FRONT
        T_AMB_REAR
        BIOS
        CPLD
        NET0

    Properties:
        type = Motherboard
        product_name = 6275-HPC,W/IB
        product_part_number = 000-0000-00
        product_serial_number = 0000000000
        product_version = (none)
        product_manufacturer = SUN MICROSYSTEMS
        fru_name = 6275-HPC,W/IB
        fru_part_number = 375-3603-01
        fru_serial_number = 0328MSL-09046ROOFN
        fault_state = OK
        clear_fault_action = (none)

    Commands:
        cd
        show

->
```

For more information about using the CLI to monitor and manage the server, refer to the *Integrated Lights Out Manager Administration Guide.*

Fault Management

Your ILOM software includes the ability to diagnose faults as they occur, where faults are defined as system component failures or chassis problems, such as environmental parameters outside acceptable ranges.

ILOM reports faults for server node components that have a `fault_state` property. You can see which components have this property by selecting the Components tab in the System Information view (tab). Components with the `fault_state` property show `OK` or `Fault` in the Fault Status column of the Component Management Status table. Components that lack the `fault_state` property show a hyphen (-).

Chassis environmental values are not shown in the Component Management Status table although they can have a faulted status and can be listed in the Faulted Components table of the Fault Management view (tab).

Chassis faults include the following:

- CMM failure
- Chassis temperature above a maximum threshold
- Fan failure
- Power supply failure
- Voltage out of acceptable range
- Network Express Module voltage or temperature out of range

The following figure shows a typical list of system components. Only those that have entries other than a hyphen (-) in the Fault Status column can be reported as faults.

FIGURE 4-6 ILOM 2.0 GUI: System Information > Component Management View

Fault Types

There are three types of faults:

- Self-correcting
- Correctable
- Uncorrectable.

When correctable and uncorrectable faults occur, they do the following:

- Turn on the server node's front-panel Service Action Required LED.
- Turn on subsystem-specific Service LEDs (CPU, DIMMs) when applicable.
- Create an entry in the ILOM's Fault Management list.
- Create an entry in the ILOM System Event Log (SEL).

Note – The SEL contains entries for every event that occurs, such as starting and stopping the system, while the Fault Management list includes events that require service action. The Fault Management list is much more specific than the SEL.

Clearing Faults

When you correct a component fault, you can clear it from the SP ILOM web interface System Information --> Components tab, using the Clear Faults action from the Actions drop-down list box. This also clears the fault from the Fault Management list and turns off the Service Action Required LED. Refer to the *Sun Blade X6275 ILOM Supplement* for a list of faults that you can clear.

Chassis faults must be cleared from the CMM, at which time they are also cleared from the SP.

Viewing Faults

Choose one of the following methods for viewing faults with ILOM:

- "To View the Fault Management List With the ILOM Web Interface" on page 29
- "To View the Fault Management List With the ILOM CLI" on page 30

▼ To View the Fault Management List With the ILOM Web Interface

1. **Log in to the ILOM web interface for the server node's SP. See one of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 16

   "To Log In to the SP ILOM Web Interface Directly" on page 18

   The interface opens to the System Information tab.

2. **Select the System Information --> Fault Management tab.**

   The Faulted Components list appears. If there are no faults, the list contains only the entry "No Items To Display." If there is a fault, the faulted component is listed by component name, as shown in the following figure.

FIGURE 4-7   ILOM 2.0 GUI: System Information > Component Management View

3. **Click the component name to obtain more information.**

A dialog box opens with more detail. The following figure shows a fault on DIMM 7 of CPU 1 on the motherboard (MB).

FIGURE 4-8   ILOM 2.0 GUI: System Information > Fault Management > Fault Dialog Box
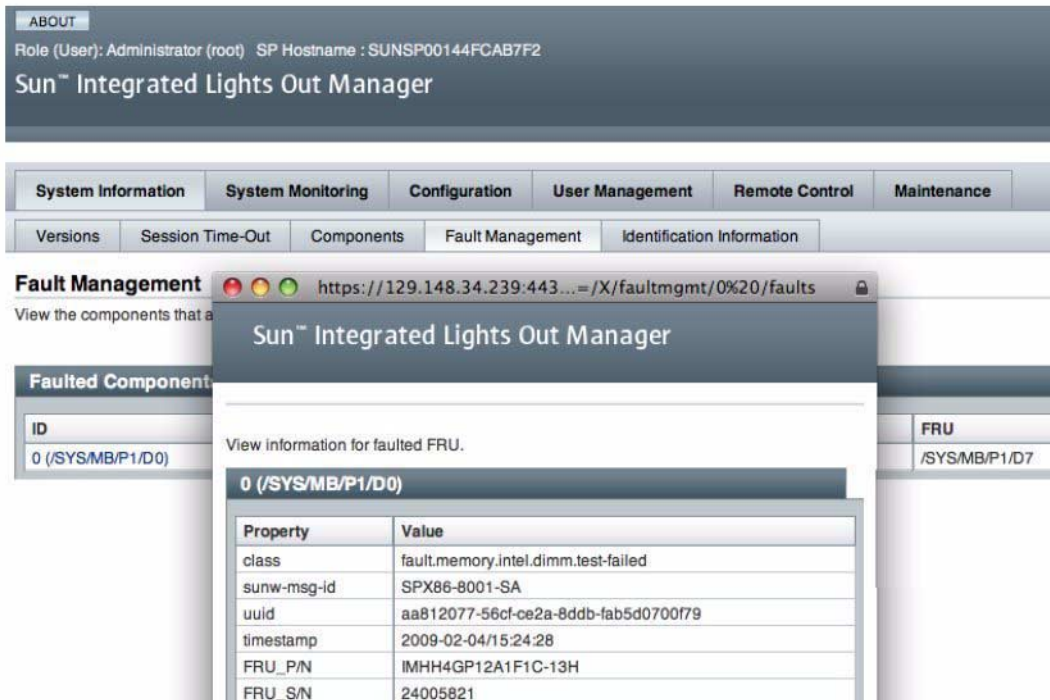
▼ To View the Fault Management List With the ILOM CLI

1. **Log in to the ILOM CLI for the server node's SP. See one of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 18

   "To Log In to the SP ILOM CLI Directly" on page 18

   The CLI prompt appears:

   ```
   ->
   ```

2. **Type the command show /SP/faultmgmt**

   To list all details, use the command:

   –> **show /SP/faultmgmt -level all**

Faults in the ILOM System Event Log

Faults are written to the ILOM system event log. For example, an entry for a power supply fault might look like this:

```
Fault detected at time = Wed Jan 21 21:40:20 2009. The suspect
component: /SYS/PS0 has fault.chassis.env.power.loss with
probability=100. Refer to http://www.sun.com/msg/SPX86-8000-55 for
details.
```

SPX86-8000-55 is a Knowledge Article that you can look up on www.sun.com/msg.

http://www.sun.com/msg/SPX86-8000-55 is a web page with a description of the fault, how to repair or clear it, and so forth.

Choose one of the following methods for viewing the ILOM system event log:

- "To View the System Event Log With the ILOM Web Interface" on page 31
- "To View the System Event Log With the ILOM CLI" on page 32

▼ To View the System Event Log With the ILOM Web Interface

When a fault occurs, an entry is written to the system event log.

1. **Log in to the ILOM web interface for the server node's SP. See one of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 16

   "To Log In to the SP ILOM Web Interface Directly" on page 18
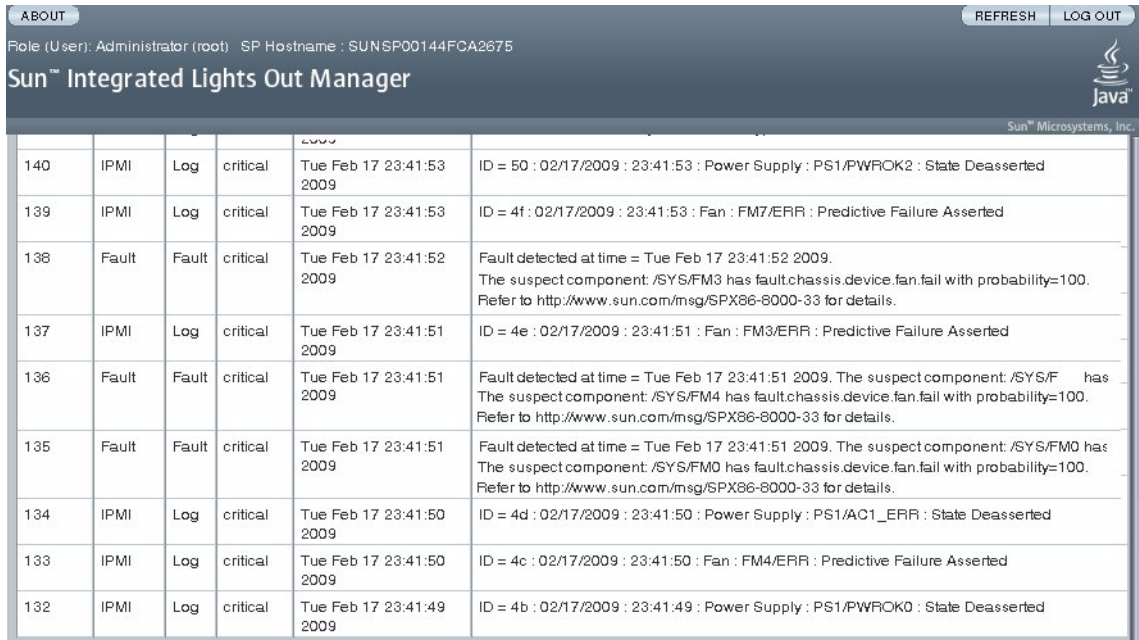
   The interface opens to the System Information tab.

2. **Select the System Monitoring tab.**

3. **Select the System Monitoring --> Event Logs tab.**

The Event Log opens, as shown in the following figure.

FIGURE 4-9 ILOM 2.0 GUI: System Monitoring > Event Logs (SEL) View

▼ To View the System Event Log With the ILOM CLI

1. **Log in to the ILOM CLI for the server node's SP. See one of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 18

   "To Log In to the SP ILOM CLI Directly" on page 18

2. **Enter the command:**

   ```
   -> show /SP/logs/event/list
   ```

Data Collection Snapshot

ILOM's Data Collector utility is used to create a "snapshot" of the server node that you can send to Sun Services for diagnosis. The utility collects log files, runs various commands and collects their output, and sends the data collection as a file to a user-defined location.

Note – The purpose of the ILOM Data Collector utility is to collect data for use by Sun Services to diagnose problems. You should not run this utility unless requested to do so by Sun Services.

Choose one of the following methods for creating a data collector snapshot:

▼ To Create a Data Collector Snapshot Using the ILOM Web Interface

1. **Log in to the ILOM web interface for the server node's SP. See one of the following:**

   The interface opens to the System Information tab.

2. **Select the Maintenance tab.**

3. **Select the Data Collector tab.**

   The Data Collector panel opens, as shown in the following figure.

FIGURE 4-10 ILOM 2.0 GUI: Maintenance > Service Snapshot View
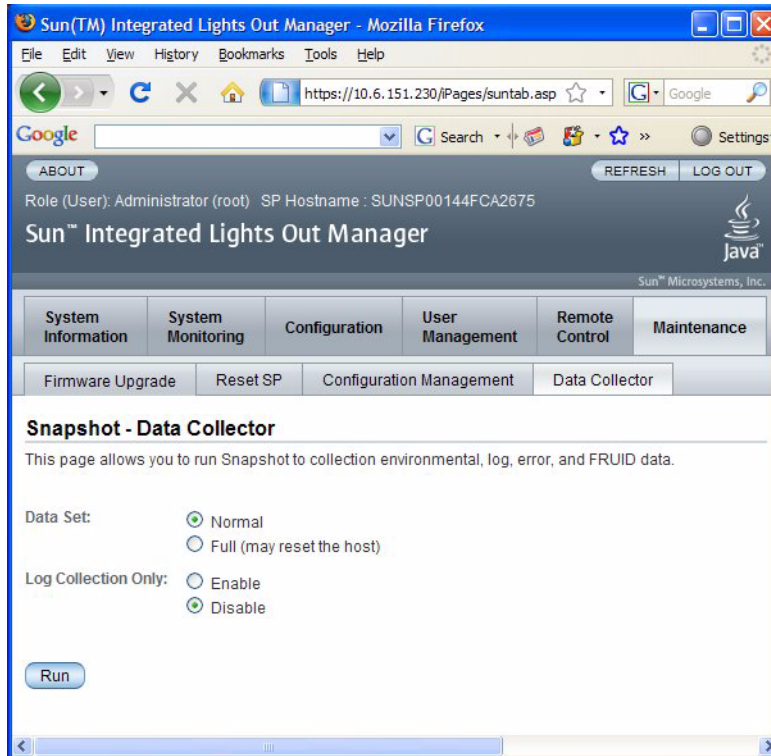
You can choose a basic or extended data set. You can also choose to send only event logs. Event logs include the system event log and several others.

4. **To send maximum information, choose the Full and Disable radio buttons and click the Run button.**

   or

   To send minimum information, choose the Normal and Enable radio buttons and click the Run button.

   A Save As dialog box appears.

5. **Specify the path and filename of the file where you want the results written.**

6. **Click OK to save the file.**

▼ To Create a Data Collection Snapshot Using the ILOM CLI

1. Log in to the ILOM CLI for the server node's SP. See one of the following:

"To Log In to the SP CLI Through the CMM ILOM CLI" on page 18

"To Log In to the SP ILOM CLI Directly" on page 18

The CLI prompt appears:
->

2. Use the `set` command:

`-> `**`set /SP/diag/snapshot dataset=`**`MODE`

For example:

`-> `**`set dataset=full`**

`Set 'dataset' to 'full'`

where *MODE* can be:

normal—(default) Specifies that ILOM, operating system, and hardware information is to be collected.

normal-logonly

full—Specifies that the maximum information is to be collected.

full-logonly

Note – Because `normal` is the default, in most cases you do not need to set the dataset property.

Note – Using the `full` option may reset the running host.

---

3. To initiate the snapshot data collection, enter:

`-> `**`set /SP/diag/snapshot dump_uri=`**`URI`

where *URI* specifies the target directory in the format:

protocol`://`*username*`:`*password*`@`*host*`/`*directory*

For example:

`ftp://``username`**`:`**`password`**`@`**`host_ip_address`**`/data`**

where `password` is the actual administrator password for the domain.

And where the directory, `data` is relative to the user's login.

▼ To View the Dataset Properties

1. **Use the** `cd` **command to get to the** `/SP/diag/snapshot` **directory:**

   ```
   -> cd SP/diag/snapshot
   /SP/diag/snapshot
   ```

2. **Use the** `show` **command to view the dataset property:**

   ```
   -> show

    /SP/diag/snapshot
       Targets:

       Properties:
           dataset = full
           dump_uri = (Cannot show property)
           result = (none)

       Commands:
           cd
           set
           show
   ```

CHAPTER **5**

ILOM 3.0 Diagnostic Tools

The ILOM 3.0 software running on your service processor (SP) has a complete suite
of diagnostic capabilities. You can view event logs, the state of the sensors on the
server node, and a list of critical faults, if any.

This chapter includes the following topics:

Accessing the SP

Prerequisites

At minimum, you need to know the IP address of the Chassis Monitoring Module
(CMM). Refer to the *Sun Integrated Lights Out Manager User's Guide* for a procedure
to obtain the CMM IP address.

After you have obtained the IP address of the CMM, you can obtain the IP address
of the SP. The next topic describes a procedure for obtaining the SP IP address
through the CMM ILOM web interface. Refer to *Sun Blade X6275 Server Module
Installation Guide* for a procedure using the ILOM CLI.

Choose one of the following methods to log in to the SP:

▼ To Log In to the SP Through the CMM ILOM Web Interface

1. Open a browser and type `http://`<*CMM IP address*>

The CMM ILOM Welcome screen appears:

FIGURE 5-1 ILOM 3.0 GUI Welcome Screen
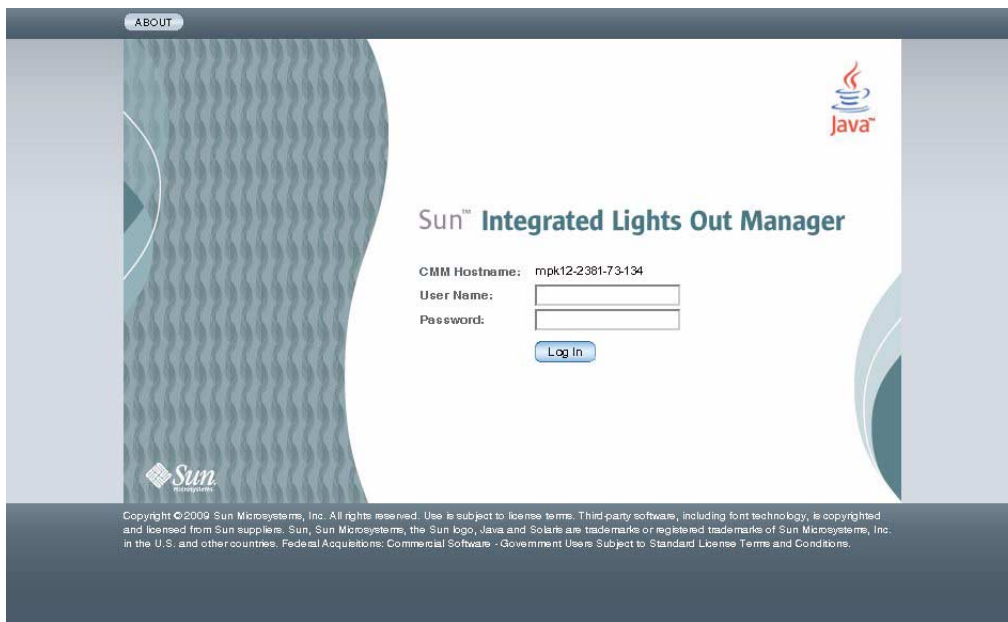
2. **Enter `root` as your username and `changeme` as your password (unless you have previously changed your password).**

   The CMM ILOM System Information > Versions tab opens:

FIGURE 5-2 ILOM 3.0 GUI: System Information > Versions View
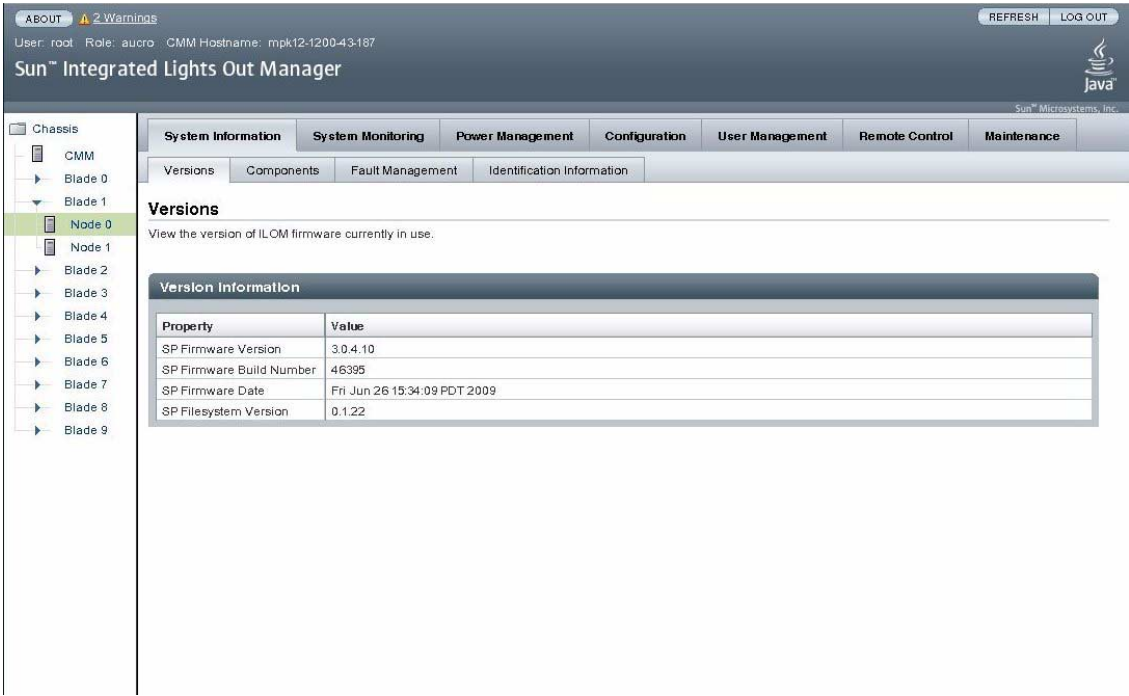
3. **To log in to the SP for a node, click on the node's name in the left navigation pane or in the image in the right pane.**

   The home page (System Information tab) for the node appears in the ILOM web interface:

Note – Under each X6275 blade are 2 nodes: node 0 and node 1. In the GUI, all the top nodes are numbered Node 0, and all the bottom nodes are numbered Node 1.

Note – When you are logged in to the SP through the CMM ILOM web interface, you can obtain the IP address of the SP by selecting the Configuration tab and then the Network tab.

▼ To Log In to the SP ILOM Web Interface Directly

1. Open a browser and type `http://<`*SP IP address*`>`

The SP ILOM welcome screen opens.

2. Enter `root` as your username and `changeme` as your password (unless you have previously changed your password).

The ILOM web interface presents the home page (System Information tab) for the node.

▼ To Log In to the SP CLI Through the CMM ILOM CLI

1. Open a terminal and type `ssh root@<`*CMM IP address*`>`

2. Enter `changeme` as your password (unless you have previously changed your password).

```
You are logged in to the CMM CLI. The CLI prompt appears:
->
```

3. To log in to the CLI for node 1 of blade 6, for example, enter this command:

```
-> start /CH/BL6/NODE1/SP/cli
Are you sure you want to start /CH/BL6/NODE1/SP/cli (y/n)? y
```

You are logged in to the CLI for the SP of that node. The CLI prompt appears:

```
->
```

4. Change directories to the host or to the SP:

To change directories to the host, type:

```
cd /SYS
```

To change directories to the SP, type:

```
cd /SP
```

▼ To Log In to the SP ILOM CLI Directly

1. Open a terminal and type:

```
ssh root@SP_IP_address
```

2. **Enter `changeme` as your password (unless you have previously changed your password).**

   You are logged in to the CLI for the SP of that node. The CLI prompt appears:

   ```
   ->
   ```

3. **Change directories to the host or to the SP:**

   To change directories to the host, type:

   `cd /SYS`

   To change directories to the SP, type:

   `cd /SP`

▼ To Log In to the SP Through the Serial Console

1. **Connect via a terminal window.**

2. **Type `root` at the login prompt**

   Example:

   ```
   SUNSP06449CA28 login: root
   ```

3. **Enter password `changeme`.**

   The default command prompt appears:

   ```
   ->
   ```

4. **Enter `changeme` as your password (unless you have previously changed your password).**

   Once you have successfully logged in, the service processor displays the SP default command prompt:

   ```
   SP->
   ```

You can now run CLI commands. Change the IP address if you need a different static IP address.

Note – If you connect a terminal or emulator to the serial port before it has been powered up or during its power up sequence, you will see bootup messages.

By default, each new system comes with the IP address and DHCP enabled.

Monitoring the Server Node With ILOM 3.0

Choose one of the following methods for monitoring your node with ILOM:

- "Monitoring Status Using the ILOM Web Interface" on page 42
- "Monitoring Status Using the ILOM CLI" on page 43

Monitoring Status Using the ILOM Web Interface

You can use the System Information and System Monitoring views of the ILOM web interface to monitor the status of the server module and its components.

1. **Access a web browser.**

2. **Log in to the web interface. See one of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 38

   "To Log In to the SP ILOM Web Interface Directly" on page 40

   The System Information view opens.

3. **Select the submenu screens to view system and component information.**

   TABLE 5-1 lists the System Information submenu tab functions.

TABLE 5-1   The ILOM System Information Tab Submenu Screens and Tasks

System Monitoring Tab	Tasks
Versions	View server board and SP versions.
Session Time-Out	Select an inactivity time-out for your session.
Components	View information about all the components that are present.
Fault Management	See "Fault Management" on page 47.
Identification Information	Change the SP identification information, such as host name and address.

Refer to the *Integrated Lights Out Manager Administration Guide* for more information about the System Information tab.

4. **Click the System Monitoring tab.**

The System Monitoring submenu screens appear.

TABLE 5-2 lists the submenu tabs and tasks.

TABLE 5-2 The ILOM System Monitoring Tab Submenu Screens

System Monitoring Tab	Tasks
Sensors Reading	View the name, type and readings of sensors.
Indicators	View the name and status of the LEDs. Shows both front-panel and internal LEDs.
Event Logs	View events, including details such as event ID, class, type, severity, date and time, and description of event.

Refer to the *Integrated Lights Out Manager Administration Guide,* for more information about the System Monitoring tab.

Monitoring Status Using the ILOM CLI

You can use the ILOM CLI to monitor the server module status and the status of its components

1. **Open a terminal.**

2. **Log in to the CLI. See either of the following:**

The CLI prompt appears:

    ->

3. **Navigate to the** `/SYS` **namespace.**

4. **Use the CLI** `cd` **(change directory) command to navigate to individual components listed below:**

Component Name	Type
/SYS	Host system
/SYS/SP	Service Processor
/SYS/SP/NET0	Network interface
/SYS/MB	Motherboard

Component Name	Type
/SYS/MB/P0	Host processor
/SYS/MB/P0/D1	DIMM
/SYS/MB/P0/D3	DIMM
/SYS/MB/P0/D5	DIMM
/SYS/MB/BIOS	BIOS
/SYS/MB/CPLD	NVRAM
/SYS/MB/NET0	Network interface
/SYS/MIDPLANE	Chassis
/SYS/PS1	Power supply
/SYS/NEM1	Network module
/SYS/CMM	Chassis Monitoring Module

For example, from the /SYS namespace, enter cd MB/P0/D1 to look at DIMM 1 of processor 0:

```
-> cd MB/P0/D1
/MB/P0/D1

-> show

 /SYS/MB/P0/D1
    Targets:
        PRSNT
        SERVICE

    Properties:
        type = DIMM
        ipmi_name = P0/D1
        fru_name = 2GB DDR3 SDRAM 533
        fru_manufacturer = Hynix Semiconductor Inc.
        fru_version = 5442
        fru_part_number = HMT125R7AFP4C-G7
        fru_serial_number = 200E0000
        fault_state = OK
        clear_fault_action = (none)

    Commands:
        cd
        set
        show
```

For example, from `/SYS/MB/`, to look at processor 0:

```
-> cd /SYS/MB/P0
/SYS/MB/P0

-> show

/SYS/MB/P0
   Targets:
        D1
        D3
        D5
        PRSNT
        SERVICE

   Properties:
        type = Host Processor
        ipmi_name = P0
        fault_state = OK
        clear_fault_action = (none)

   Commands:
        cd
        set
        show
```

For example, from `/SYS/MB/`, to look at the motherboard:

```
-> cd /SYS/MB/
/SYS/MB

-> show

 /SYS/MB
    Targets:
        BIOS
        CPLD
        NET0
        P0
        P1
        T_AMB_FRONT
        T_AMB_REAR

    Properties:
        type = Motherboard
        ipmi_name = MB
        product_name = SUN BLADE X6275 SERVER MODULE
        product_part_number = 000-0000-00
        product_serial_number = 0000000000
        product_manufacturer = SUN MICROSYSTEMS
        fru_name = VAYU-HPC,W/IB
        fru_part_number = 375-3603-01
        fru_serial_number = 0328MSL-09046R00KP
        fault_state = OK
        clear_fault_action = (none)

    Commands:
        cd
        set
        show
```

For more information about using the CLI to monitor and manage the server, refer to the *Sun Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide* (820-6412).

Fault Management

Your ILOM software includes the ability to diagnose faults as they occur, where faults are defined as system component failures or chassis problems, such as environmental parameters outside acceptable ranges.

ILOM reports faults for server node components that have a `fault_state` property. You can see which components have this property by selecting the Components tab in the System Information view (tab). Components with the `fault_state` property show `OK` or `Fault` in the Fault Status column of the Component Management Status table. Components that lack the `fault_state` property show a hyphen (-).

Chassis environmental values are not shown in the Component Management Status table; although, they can have a faulted status and can be listed in the Faulted Components table of the Fault Management view (tab).

Chassis faults include the following:

- CMM failure
- Chassis temperature above a maximum threshold
- Fan failure
- Power supply failure
- Voltage out of acceptable range
- Network Express Module voltage or temperature out of range

The following figure shows a typical list of system components. Only those that have entries other than a hyphen (-) in the Fault Status column can be reported as faults.

FIGURE 5-3   ILOM 3.0 GUI: System Information > Component Management View

Fault Types

There are three types of faults:

- Self-correcting
- Correctable
- Uncorrectable.

When correctable and uncorrectable faults occur, they do the following:

- Turn on the server node's front-panel Service Action Required LED.
- Turn on subsystem-specific Service LEDs (CPU, DIMMs) when applicable.
- Create an entry in the ILOM's Fault Management list.
- Create an entry in the ILOM System Event Log.

Note – The Fault Management list is much more specific than the System Event Log (SEL). The SEL contains entries for every event that occurs, such as starting and stopping the system, while the Fault Management list only includes events that require service action. See "To View the Fault Management List With the ILOM Web Interface" on page 50.

Clearing Faults

When you correct a component fault, you can clear it from the SP ILOM web interface System Information --> Components tab, using the Clear Faults action from the Actions drop-down list box. This also clears the fault from the Fault Management list and turns off the Service Action Required LED. Refer to the *Sun Blade X6275 ILOM Supplement* for a list of faults that you can clear.

Chassis faults must be cleared from the CMM, at which time they are also cleared from the SP.

Viewing Faults

Choose one of the following methods for viewing faults with ILOM:

- "To View the Fault Management List With the ILOM Web Interface" on page 50
- "To View the Fault Management List With the ILOM CLI" on page 51

▼ To View the Fault Management List With the ILOM Web Interface

1. **Log in to the ILOM web interface for the server node's SP. See one of the following:**

   The interface opens to the System Information tab.

2. **Select the System Information --> Fault Management tab.**

   The Faulted Components list appears. If there are no faults, the list contains only the entry "No Items To Display." If there is a fault, the faulted component is listed by component name, as shown in the following figure (example shown is through web interface directly):

FIGURE 5-4   ILOM 3.0 GUI: System Information > Fault Management View
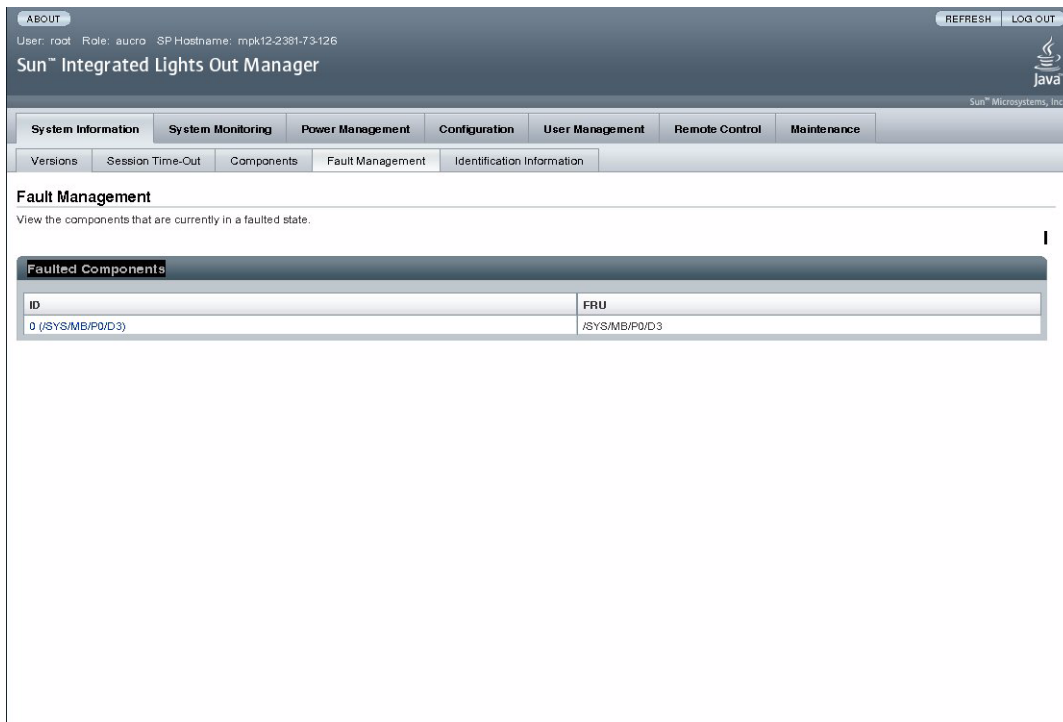
3. **Click the component name to obtain more information.**

   A dialog box opens with more detail. FIGURE 5-5 shows a faults on a hardware component. Below shows a fault on DIMM 3.

ILOM 3.0 GUI: System Information > Fault Management > Fault Dialog Box
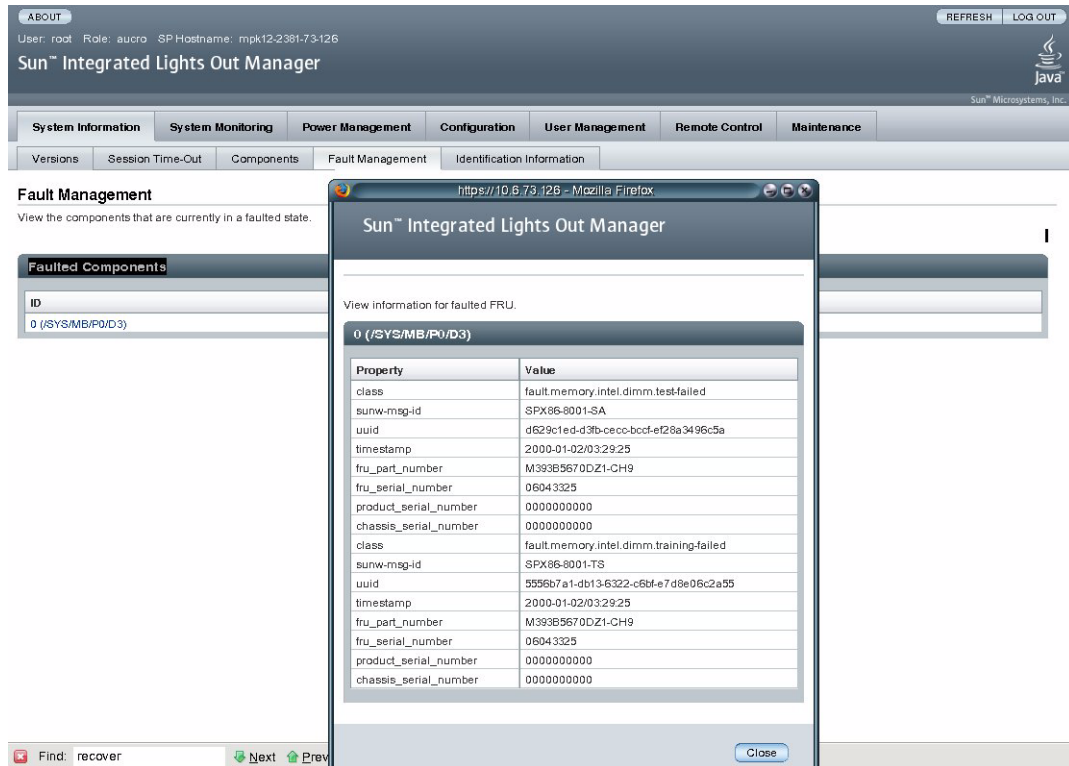
▼ To View the Fault Management List With the ILOM CLI

1. **Log in to the ILOM CLI for the server node's SP. See one of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 40

   "To Log In to the SP ILOM CLI Directly" on page 40

   The CLI prompt appears:

   ```
   ->
   ```

2. **Type the following command:**

   ```
   -> show /SP/faultmgmt -level all
   ```

   The output will show all fault details.

Faults in the ILOM System Event Log

Faults are written to the ILOM system event log. For example, an entry for a power supply fault might look like this:

```
Fault detected at time = Wed Jan 21 21:40:20 2009. The suspect
component: /SYS/PS0 has fault.chassis.env.power.loss with
probability=100. Refer to http://www.sun.com/msg/SPX86-8000-55 for
details.
```

SPX86-8000-55 is a Knowledge Article that you can look up on www.sun.com/msg.

http://www.sun.com/msg/SPX86-8000-55 is a web page with a description of the fault, how to repair or clear it, and so forth.

Choose one of the following methods for viewing the ILOM system event log:

- "To View the System Event Log With the ILOM Web Interface" on page 52
- "To View the System Event Log With the ILOM CLI" on page 53

▼ To View the System Event Log With the ILOM Web Interface

When a fault occurs, an entry is written to the system event log.

1. **Log in to the ILOM web interface for the server node's SP. See one of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 38

   "To Log In to the SP ILOM Web Interface Directly" on page 40.

   The interface opens to the System Information tab.

2. **Select the System Monitoring tab.**

3. **Select the System Monitoring --> Event Logs tab.**

   The Event Log opens, as shown in the following figure:

FIGURE 5-6   ILOM 3.0 GUI: System Monitoring > Event Logs (SEL) View
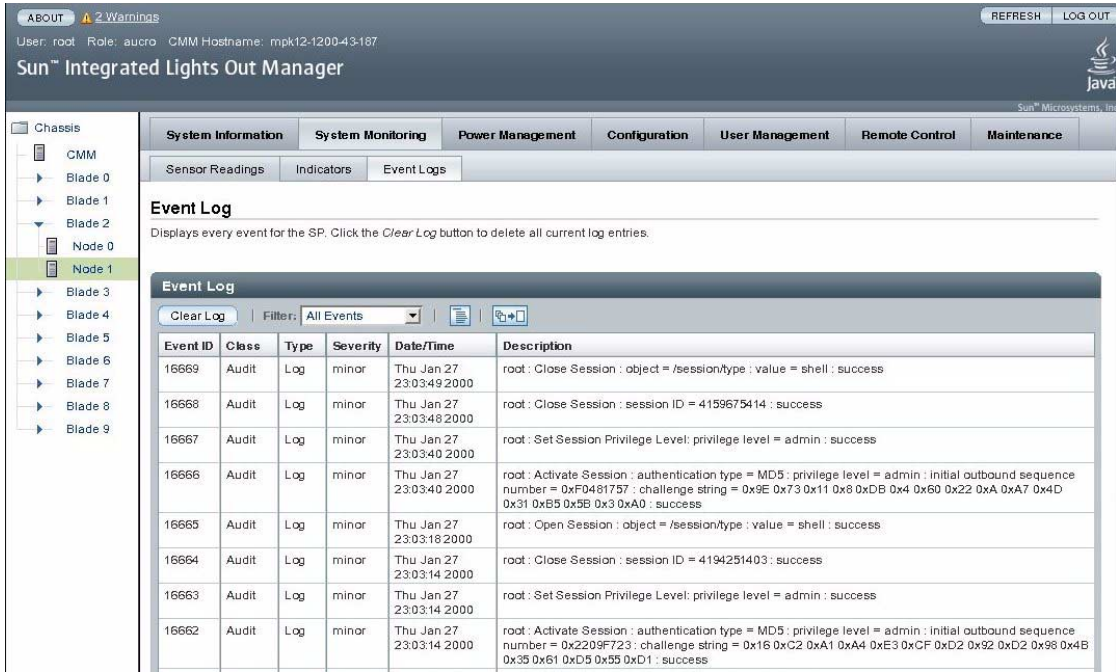
▼ To View the System Event Log With the ILOM CLI

1. **Log in to the ILOM CLI for the server node's SP. See one of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 40

   "To Log In to the SP ILOM CLI Directly" on page 40.

2. **Enter the command:**

   `-> show /SP/logs/event/list`

Data Collection Snapshot

ILOM's Service Snapshot utility is used to create a "snapshot" of the server node that you can send to Sun Services for diagnosis. The utility collects log files, runs various commands and collects their output, and sends the data collection as a file to a user-defined location.

Note – The purpose of the ILOM Snapshot utility is to collect data for use by Sun Services to diagnose problems. You should not run this utility unless requested to do so by Sun Services.

Choose one of the following methods for creating a snapshot:

- "To Create a Data Collection Snapshot Using the ILOM Web Interface" on page 54
- "To Create a Data Collection Snapshot Using the ILOM CLI" on page 56
- "To View the Dataset Properties" on page 57

▼ To Create a Data Collection Snapshot Using the ILOM Web Interface

1. **Log in to the ILOM web interface for the server node's SP. See either of the following:**

   "To Log In to the SP Through the CMM ILOM Web Interface" on page 38

   "To Log In to the SP ILOM Web Interface Directly" on page 40.

   The interface opens to the System Information tab.

2. **Select the Maintenance tab.**

3. **Select the Snapshot tab.**

   The Service Snapshot panel opens, as shown in the following figure:

ILOM 3.0 GUI: Maintenance > Service Snapshot View
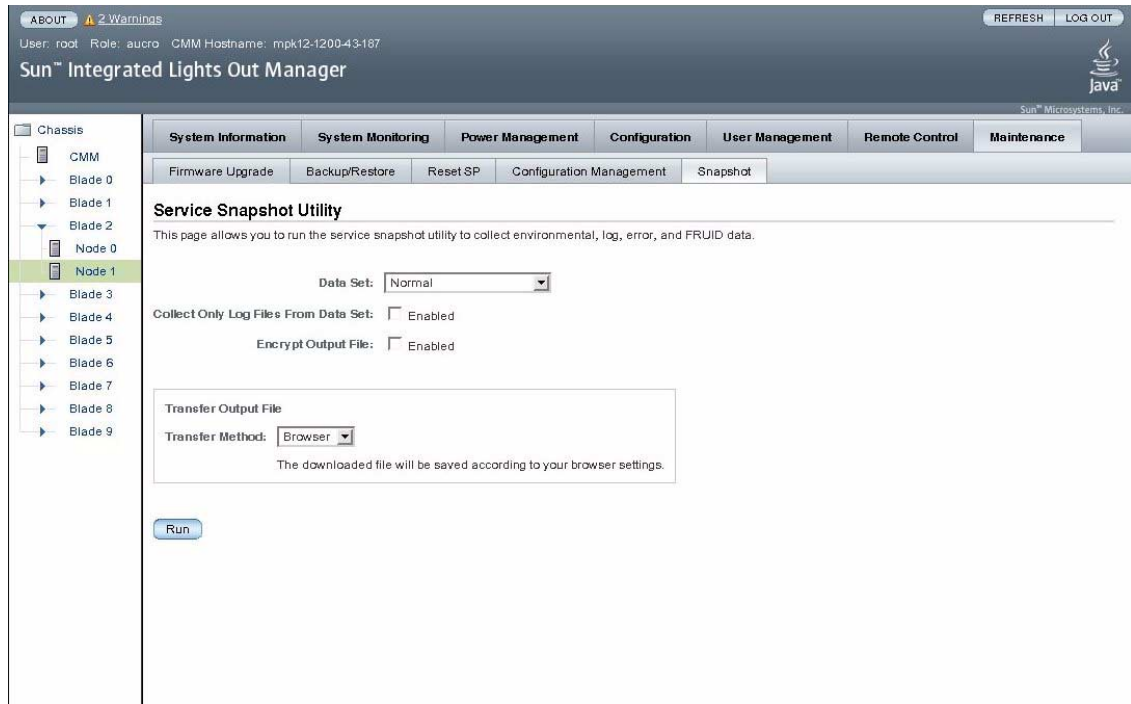
a. **Choose a basic or extended dataset from the pull-down menu (Normal, FRUID, Full, Custom).**

   Normal—(default) Specifies that ILOM, operating system, and hardware information is to be collected.

   FRUID

   Full—The maximum information. Specifies that all data is to be collected. (Note—Using this option may reset the running host.)

   Custom—Select from options to include ILOM data, HW data, Diag data, basic OS data, FRUID data.

   The default is normal, so in most cases you do not need to set the dataset property.

b. **Choose to enable collecting only log files from the data set.**

c. **Choose to enable the encryption of the output file.**

d. Chose the transfer output file method (Browser, SFTP, FTP).

4. **After making selections, click Run.**

5. **Specify the path and filename of the file where you want the results written.**

6. **Click OK to save the file.**

▼ To Create a Data Collection Snapshot Using the ILOM CLI

1. **Log in to the ILOM CLI for the server node's SP. See either of the following:**

   "To Log In to the SP CLI Through the CMM ILOM CLI" on page 40

   "To Log In to the SP ILOM CLI Directly" on page 40.

   ```
   The CLI prompt appears:
   ->
   ```

2. **Use the** `set` **command:**

   `-> `**`set /SP/diag/snapshot dataset=`***`MODE`*

   For example:

   `-> `**`set dataset=full`**

   ```
   Set 'dataset' to 'full'
   ```

   where *MODE* can be:

   `normal`—(default) Specifies that ILOM, operating system, and hardware information are to be collected.

   `normal-logonly`—(default) Specifies that ILOM, operating system, and hardware information is to be collected.

   `FRUID`

   `FRUID-logonly`

   `full`—Specifies that the maximum information is to be collected.

   `full-logonly`—To collect only the log files from the dataset, select the log only options.

Note – Because `normal` is the default, in most cases you do not need to set the dataset property.

Note – Using the `full` option may reset the running host.

---

3. To initiate the snapshot data collection, enter:

`-> set /SP/diag/snapshot dump_uri=`*URI*

where *URI* specifies the target directory in the format:

*protocol***://***username***:***password***@***host***/***directory*

For example:

ftp://*username***:***password***@***host_ip_address***/data**

where *password* is the actual administrator password for the domain.

And where the directory, data is relative to the user's login.

▼ To View the Dataset Properties

1. Use the `cd` **command to get to the** /SP/diag/snapshot **directory:**

```
-> cd SP/diag/snapshot
/SP/diag/snapshot
```

2. Use the `show` **command to view the dataset property:**

```
-> show

 /SP/diag/snapshot
    Targets:

    Properties:
        dataset = normal
        dump_uri = (Cannot show property)
        encrypt_output = false
        result = (none)

    Commands:
        cd
        set
        show
```

Performing Pc-Check Diagnostic Tests

This chapter describes how to use the Pc-Check diagnostic tests, provided on the Integrated Lights Out Manager (ILOM).

This chapter contains the following sections:

Note – The screen shots examples in this chapter are from Pc-Check version 6.21. Your version of Pc-Check might vary.

Pc-Check Diagnostics Overview

If you are having a problem with your system, you can use the Pc-Check diagnostic tests to diagnose and possibly solve the problem.

The Pc-Check diagnostics can test and detect problems on all motherboard components, drives, ports, and slots. This program can be accessed and executed from ILOM.

There are three options for running Pc-Check:

- **Manual**—Runs Pc-Check in manual mode and brings you to a Pc-Check menu.
- **Enabled**—Runs basic diagnostics and takes about three minutes.
- **Extended**—Runs detailed diagnostics and takes about 30 minutes.

Running Pc-Check Diagnostics

1. **Ensure that the host power is off.**

2. **Log in to the ILOM web interface. See one of the following:**

3. **Select the Remote Control tab and then the Diagnostics tab.**

   The Diagnostics view opens as shown in FIGURE 6-1:

FIGURE 6-1   ILOM GUI: Diagnostics View
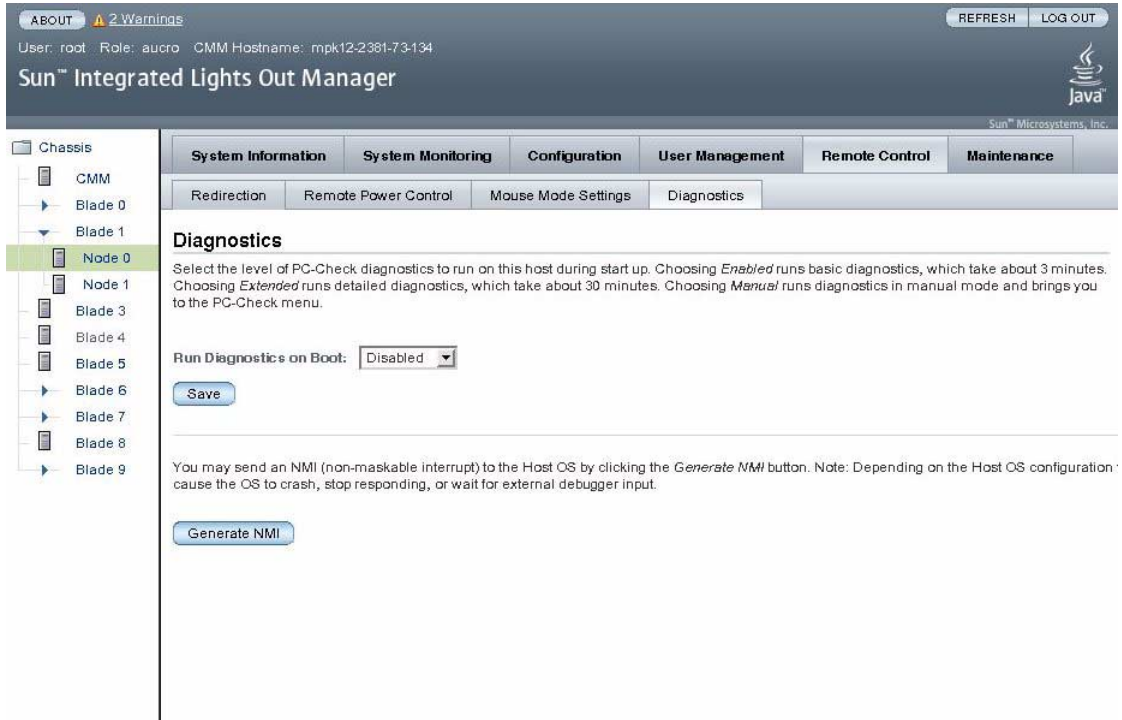
4. **From the Boot drop-down list, select the level of Pc-Check diagnostics to be run. For example Manual, as shown in FIGURE 6-2:**

FIGURE 6-2   ILOM 2.0 GUI: Diagnostics View > Manual Boot Drop-down List
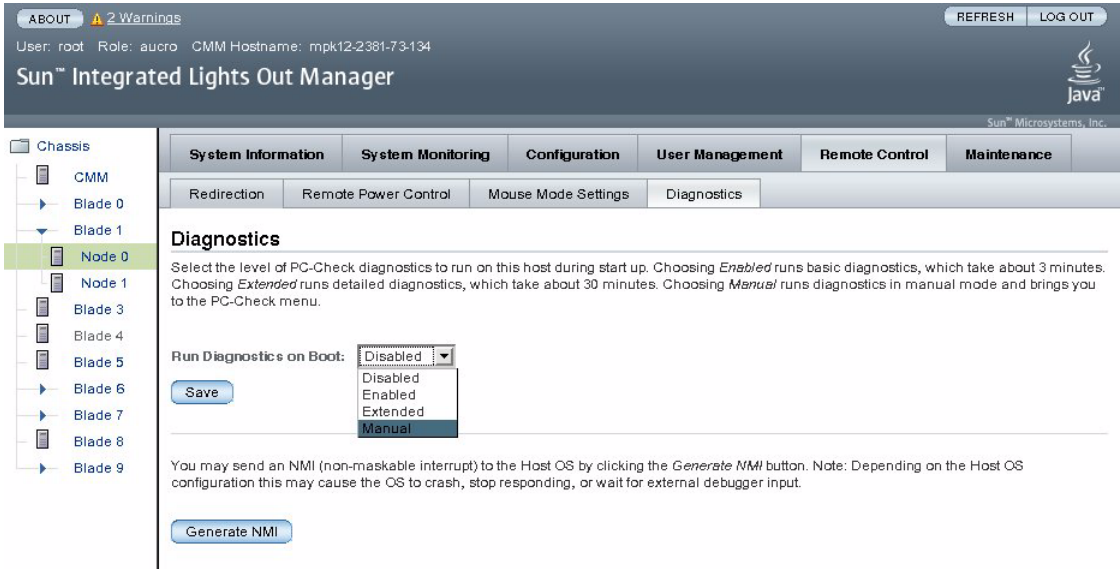
5. **Click the Save button.**

Note – The default for Run Diagnostics on Boot is Disabled, which means that Pc-Check does not run when you boot the server. The other Pc-Check levels, Enabled, Extended, and Manual, will run Pc-Check automatically when the server boots. Their results are written to a diagnostic partition, if any, on the boot disk. However, because the Sun Blade X6275 server has very limited disk space, Sun recommends that you do not create a diagnostic partition. Without a diagnostic partition, the only way you can see the results of Pc-Check diagnosis is to run Pc-Check in Manual mode. The output is displayed on a monitor or serial console connected to the system. See "Viewing the Pc-Check Results" on page 73.

The results of the automatic tests are also written to nonvolatile memory on the SP, where they can be accessed by Sun Services.

---

6. **Power on the host.**

    The host will boot up to Pc-Check.

7. **Click the Redirection submenu tab.**

   The Redirection screen appears:

FIGURE 6-3   ILOM 3.0 GUI: Remote Control > Redirection View
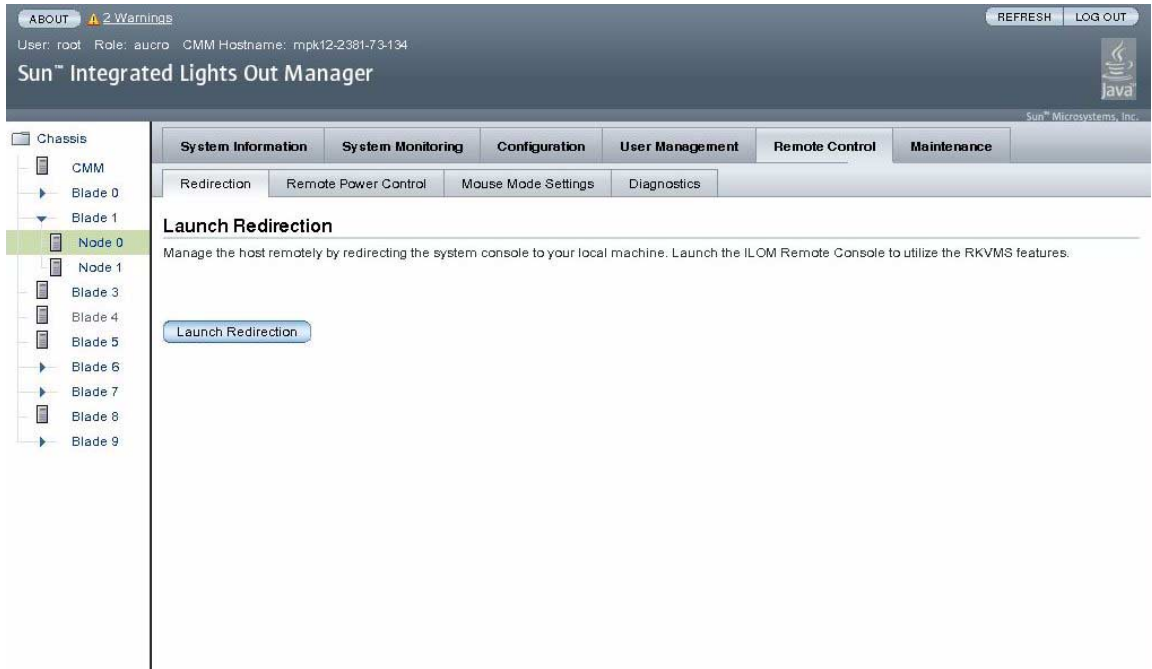
8. **Click the Launch Redirection button.**

9. **When redirection is established, return to the ILOM web interface (Remote Control tab) and select the Remote Power Control submenu.**

FIGURE 6-4   ILOM 3.0 GUI: Remote Control > Remote Power Control View
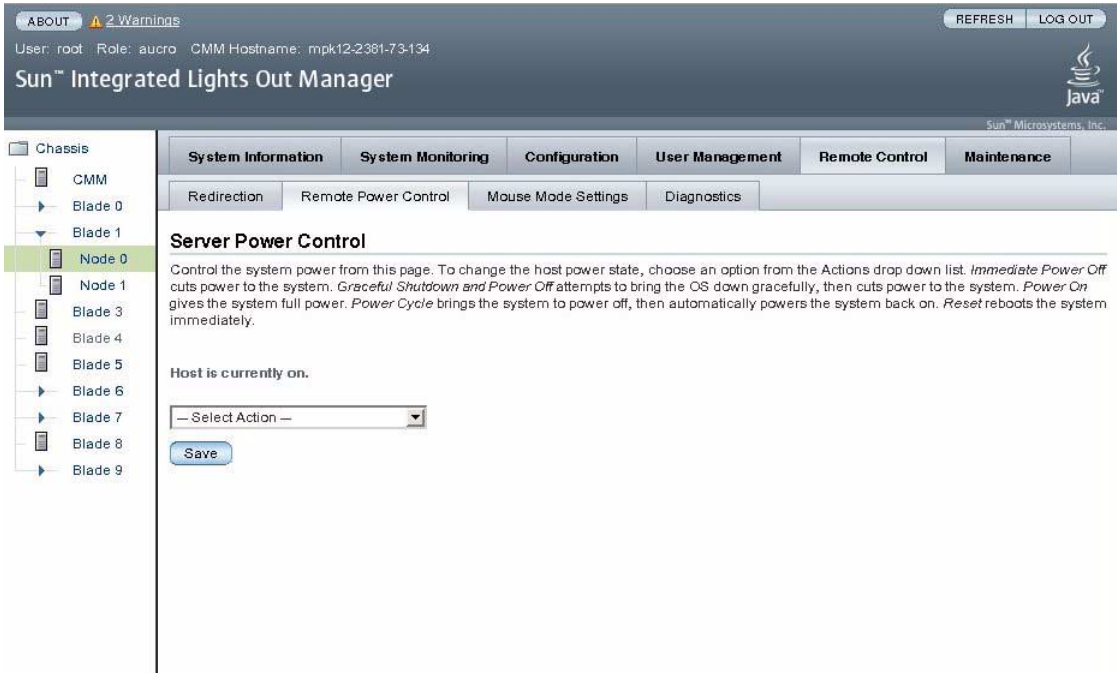
10. **Select Power On from the Select Action drop-down list box as shown in** FIGURE 6-5**.**

FIGURE 6-5   ILOM 3.0 GUI: Remote Control > Remote Power Control > Power Cycle
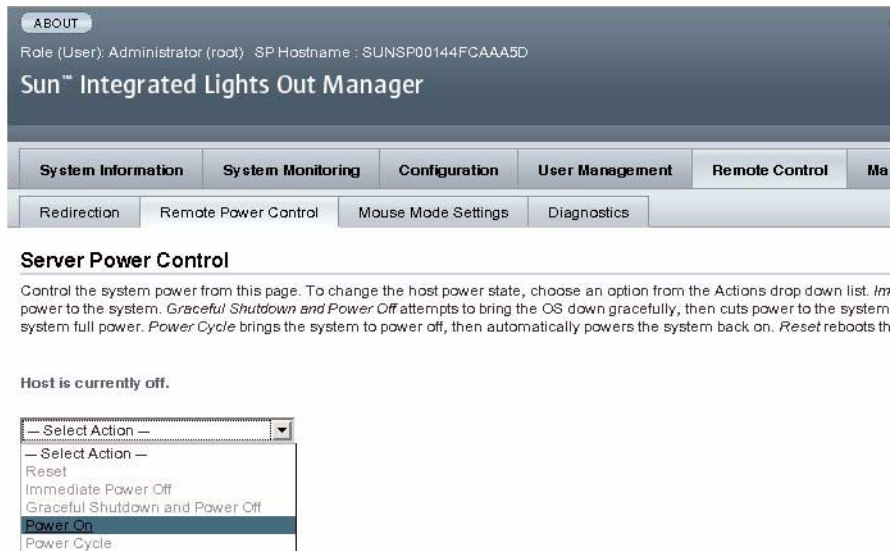
11. **Click the Save button.**

    The system reboots to the Pc-Check main menu.

12. **Return to the Redirection screen and follow the prompts to open the Pc-Check main menu, as shown in the following figure:**
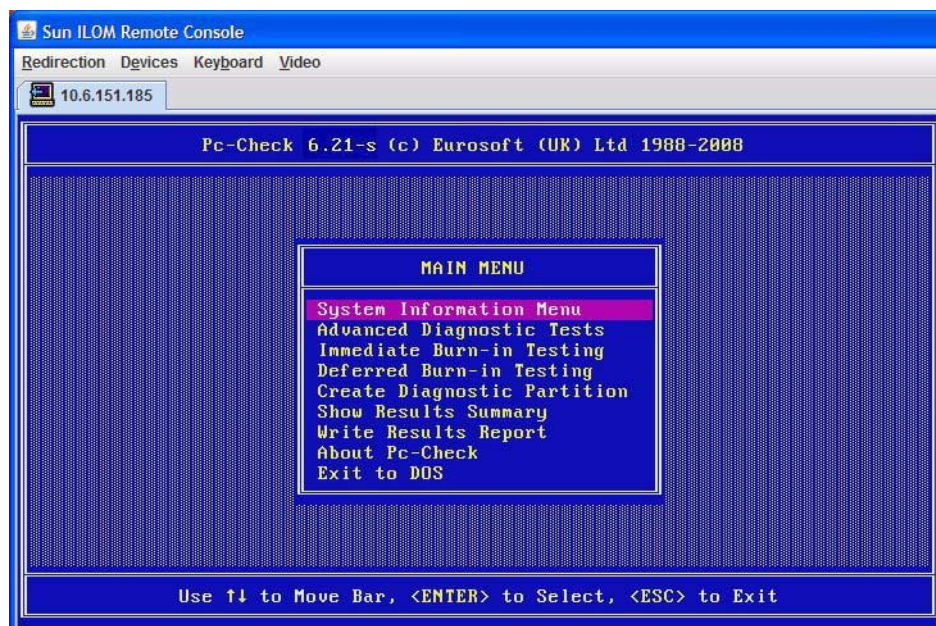
Pc-Check Main Menu

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

The Pc-Check menu provides access to the following:

- "System Information Menu" on page 67
- "Advanced Diagnostics" on page 68
- "Burn-In Testing" on page 69
- "Show Results Summary" on page 71
- "Print Results Report" on page 72
- "Exit" on page 72

Use the arrow keys on the keyboard to navigate through the diagnostics software, the Enter key to select a menu item, and the ESC key to exit a menu. Navigation instructions appear at the bottom of each screen.

System Information Menu

Click System Information in the Diagnostics main menu to view the System Information menu. Select items in this menu to see detailed information.

TABLE 6-1 describes the System Information menu options.

TABLE 6-1   System Information Menu Options

Option	Description
System Information Menu	Includes basic information about your system, motherboard, BIOS, processor, memory cache, drives, video, modem, network, buses, and ports.
Hardware ID Image Menu	Enables you to create an XML or `.txt` document showing your system's hardware ID.
System Management Info	Provides information about the BIOS type, system, motherboard, enclosure, processors, memory modules, cache, slots, system event log, memory array, memory devices, memory device mapped addresses, and system boot.
PCI Bus Info	Includes details about specific devices from `pci-config` space within the system, similar to the System Management Information section.
IDE Bus Info	Displays information about the IDE bus.
Interrupt Vectors	Displays a list of interrupt vectors.
IRQ Information	Shows hardware interrupt assignments.
Device Drivers	Shows device drivers loaded under Open DOS.
APM Information	Enables you to test and configure the Advanced Power Management (APM) capabilities of the system. You can choose to change the power state, view the power status, indicate CPU usage, get a power management event, or change the interface mode.
I/O Port Browser	Shows the I/O port assignment for the hardware devices on the system.
Memory Browser	Enables you to view the mapped memory for the entire system.
Sector Browser	Reads sector information from the hard disks sector by sector.
CPU Frequency Monitor	Tests the processor speed.
CMOS RAM Utilities	Shows the CMOS settings of the system.
Text File Editor	Opens a file editor.
Start-Up Options	Enables you to set up startup options for diagnostics testing.

Note – The Text File Editor command in the System Information Menu Options is of special importance. You use it to view the results of Pc-Check tests. See "Viewing the Pc-Check Results" on page 73.

Advanced Diagnostics

Advanced Diagnostics are used to test an individual device on the system. Most of the selections on this menu display information about the corresponding devices, and then offer a menu of testing options. For example, to test CPU 0, you can select Advanced Diagnostics, and then select Processor, and then select CPU0.

Note – If you do not know which device to test, see "Burn-In Testing" on page 69.

TABLE 6-2 gives the name and a brief description of many of the selections in the Advanced Diagnostics Tests menu.

Note – Some of the tests in TABLE 6-2 might not be applicable for your server.

TABLE 6-2   Advanced Diagnostics Test Menu Options

Option	Description
Processor	Displays information about the processors and includes a Processor Tests menu.
Memory	Displays information about the memory, and includes tests for the different types of system memory.
Motherboard	Displays information about the motherboard, and includes a Motherboard Tests menu.
Floppy Disks	Not applicable.
Hard Disks	Displays information about the hard disk, and includes a Hard Disk Tests menu.
CD-ROM/DVD	Not applicable.
ATAPI Devices	Not applicable.
ATA	Includes an ATA test menu. Select the serial ATA driver to test.
USB	Displays information about the USB devices on the system and includes a USB Tests menu.
Network	Performs network register controller tests.

TABLE 6-2   Advanced Diagnostics Test Menu Options *(Continued)*

Option	Description
System Stress Test	Exercises and checks the CPU, memory, and hard drive.
Keyboard	Includes a Keyboard Test menu with options for performing different tests on the keyboard.
Mouse	Displays information about the mouse and includes a menu to test the mouse on the system.
Audio	Not applicable.
Video	Displays information about the video card. Initially, the monitor might flicker, but then the system brings up a Video Test Options menu that enables you to perform various video tests.
Firmware –ACPI	Displays information about Advanced Configurable Power Interface (ACPI) and includes an ACPI Tests menu.

Burn-In Testing

Burn-in testing enables you to run test scripts and to create new scripts.

The Diagnostics main menu provides two burn-in selections, Immediate Burn-In Testing and Deferred Burn-In Testing.

- Immediate Burn-In enables you to run an existing script and to select configuration options. See .
- Deferred Burn-In enables you to create a new script.

Standard Scripts

Sun provides three ready-made scripts designed to test the general health of the devices on your system. These scripts include:

- `quick.tst`

  This script performs a series of tests that require the user to interact with the test software. When they require a user interaction, they stop and do not time out. These tests are faster than the `full.tst` but they are less thorough. For example, they do not run all the tests associated with a DIMM.

- `noinput.tst`

  This script performs a non-detailed test of most hardware components, excluding those components that require user input (keyboard, mouse, sound, and video). This test does not require user input. It is normally the first test performed for hardware-related problems.

- `full.tst`

  This script performs a detailed and comprehensive test on all hardware components, including those that require user input. It includes external port tests and requires loopback connectors on COM ports, parallel ports, and USB ports. You must interact with the test utility to progress through these interactive tests.

Performing Immediate Burn-In Testing

Use Immediate Burn-In Testing to run test scripts.

▼ To Perform Immediate Burn-In Testing

1. **From the Diagnostics main menu, select Immediate Burn-In Testing.**

   The screen displays a list of settings shown in TABLE 6-3 and a Burn-In menu.

2. **From the menu, select Load Burn-In Script.**

   A text box appears.

3. **Type the name of the script you want to run, for example** `quick.tst`, `noinput.tst`, **or** `full.tst`.

4. **To change any of the options, at the bottom of the screen, select Change Options.**

   This opens the Burn-In Options menu, which enables you to modify the options listed in TABLE 6-3 for the currently loaded test script.

5. **Select Perform Burn-In Tests.**

   The diagnostics software executes the test script as configured.

TABLE 6-3   Continuous Burn-In Testing Options

Option	Default – General	**Default Using** `quick.tst`, `noinput.tst`, **or** `full.tst` **Script**	**All Possible Choices**
Pass Control	Overall Time	Overall Passes	Individual Passes, Overall Passes, or Overall Time
Duration	01:00	1	Enter any number to choose the time duration of the test
Script File	N/A	`quick.tst`, `noinput.tst`, or `full.tst`	`quick.tst`, `noinput.tst`, or `full.tst`

TABLE 6-3 Continuous Burn-In Testing Options *(Continued)*

Option	Default – General	Default Using `quick.tst`, `noinput.tst`, **or** `full.tst` **Script**	All Possible Choices
Report File	None	None	User defined
Journal File	None	`D:\noinput.jrl`, `D:\quick.jrl`, or `D:\full.jrl`	User defined
Journal Options	Failed Tests	All Tests, Absent Devices, and Test Summary	Failed Tests, All Tests, Absent Devices, and Test Summary
Pause on Fail	N	N	Y or N
Screen Display	Control Panel	Control Panel	Control Panel or Running Tests
POST Card	N	N	Y or N
Beep Codes	N	N	Y or N
Maximum Fails	Disabled	Disabled	1–9999

Show Results Summary

Selecting Show Results Summary on the Diagnostics main menu displays the tests that have been run and lists the results, which can be Pass, Fail, or N/A.

- Processor

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

- Motherboard

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

- Memory, Cache Memory, and Video Memory

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

- Input Device

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

- Mouse

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

■ Video

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

■ Multimedia

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

■ ATAPI Devices

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

■ Hard Disk

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

■ **USB**

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

■ **Hardware ID**

The compare test is used to determine the machine ID for the system. This test is not available for the Sun Blade X6275 server module.

Print Results Report

The Print Results Report option enables you to print results of the diagnosis of your server if it is connected to a printer through a parallel port.

Exit

The Exit option exits the Pc-Check software and reboots the server module.

Viewing the Pc-Check Results

You can use the text file editor to view the results when you run Pc-Check manually. To do this, you need to know the name of the file or files produced by the tests.

For a summary of results, you can also go the main menu and see, "Show Results Summary" on page 71.

Pc-Check Filenames

When you run a test, the header of the screen where you invoke the test shows you the name of the output file. For example, when you run the continuous burn-in test, the name of the output file is PCCHECK.BRN, as you can see in the following figure.

FIGURE 6-7   Pc-Check Continuous Burn-in Testing Page
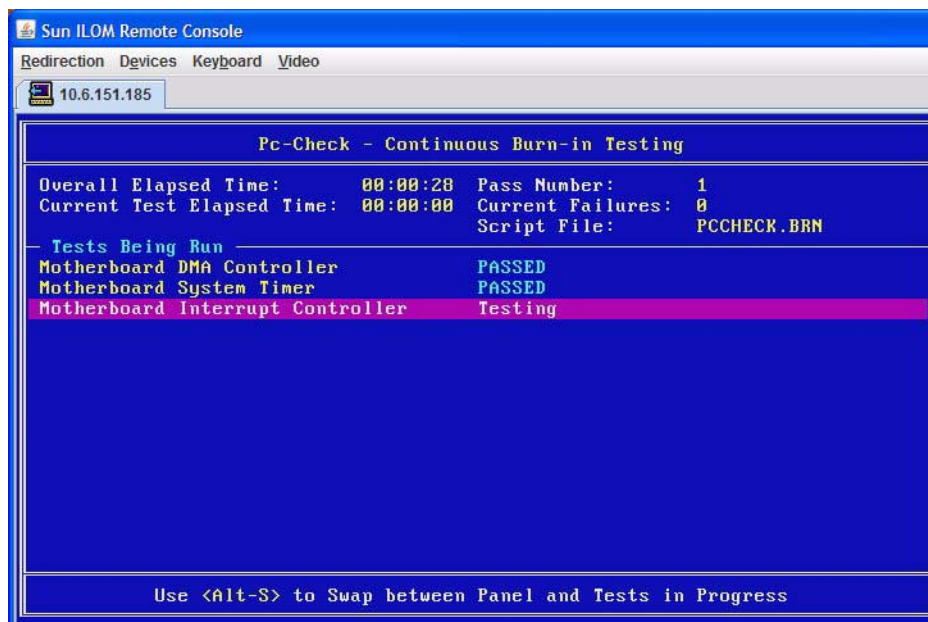
Other files are named PCCHECK.*xxx*, for example, PCCHECK.JNL or PCCHECK.HII. The .HII file is especially important because it shows the entire host configuration at the time of failure.

Viewing Pc-Check Files With the Text File Editor

When you know the name of the output file, you can use the text file editor to view the file.

1. **Select the System Information Menu option on the Pc-Check Main Menu and press Enter.**

   The System Information Menu appears, as shown here:

FIGURE 6-8   OC-Check System Information Menu
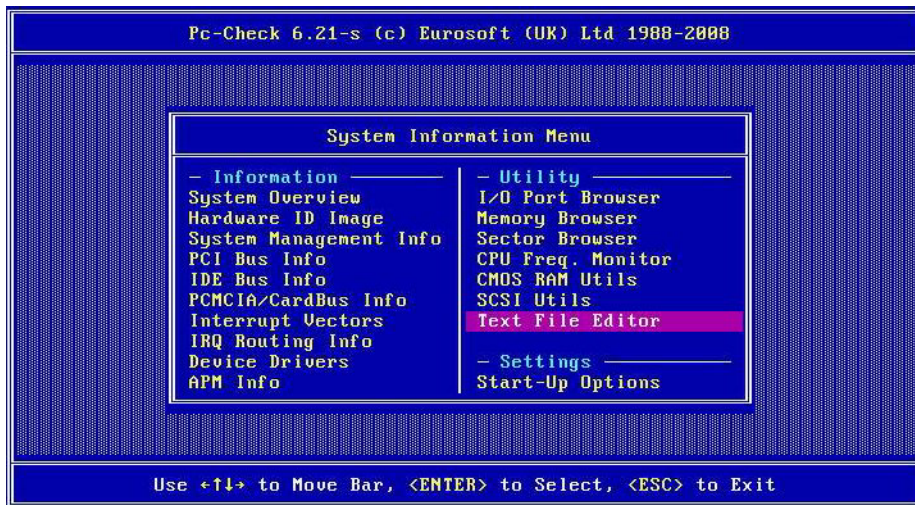
2. **Select the Text File Editor and press Enter.**

   You are prompted for a file name.

3. **Type in the file name (for example, `PCCHECK.JNL`) and press Enter.**

   The editor opens with the file displayed, as shown here:

FIGURE 6-9 Pc-Check Journal File in Text Editor


```
                              PCCHECK.JNL
                      Pc-Check 6.21-s Journal File
_
12/01/2002 01:27:12  Testing Started

12/01/2002 01:27:12  Pass 1 Started

12/01/2002 01:27:12  Testing Ended, 0 failures


                      Pc-Check 6.21-s Test Summary

12/01/2002 01:28:20  Testing Started

12/01/2002 01:28:20  Pass 1 Started

            Use ←↑↓→ <PgUp> <PgDn>, Alt-X to Exit
```

Using IPMItool to View System Information

This chapter contains information about using the Intelligent Platform Management Interface (IPMI) to view monitoring and maintenance information for your server.

Caution – Although you can use IPMItool to view sensor and LED information, do not use any interface other than the ILOM CLI or Web GUI to *alter* the state or configuration of any sensor or LED. Doing so could void your warranty.

About IPMI

IPMI is an open-standard hardware management interface specification that defines a specific way for embedded management subsystems to communicate. IPMI information is exchanged though baseboard management controllers (BMCs), which are located on IPMI-compliant hardware components. Using low-level hardware

intelligence instead of the operating system has two main benefits: first, this configuration allows for out-of-band server management, and second, the operating system is not burdened with transporting system status data.

Your ILOM Service Processor (SP) is a BMC that is IPMI v2.0 compliant. You can access IPMI functionality through the command line with the IPMItool utility either in-band or out-of-band. Additionally, you can generate an IPMI-specific trap from the web interface, or manage the server's IPMI functions from any external management solution that is IPMI v1.5 or v2.0 compliant. For more information about the IPMI v2.0 specification, go to http://www.intel.com/design/servers/ipmi/spec.htm#spec2.

About IPMItool

IPMItool is included on the X6275 blade's Tools and Drivers CD image. IPMItool is a simple command-line interface that is useful for managing IPMI-enabled devices. You can use this utility to perform IPMI functions with a kernel device driver or over a LAN interface. IPMItool enables you to manage system hardware components, monitor system health, and monitor and manage the system environment, independent of the operating system.

Locate IMPItool and its related documentation on your Tools and Drivers CD image, or download this tool from the following URL:
http://ipmitool.sourceforge.net/

IPMItool Man Page

After you install the IPMItool package, you can access detailed information about command usage and syntax from the man page that is installed. From a command line, type this command:

man ipmitool

Connecting to the Server With IPMItool

To connect over a remote interface you must supply a user name and password. The default user with admin-level access is **root** with password **changeme**. This means you must use the –U and –P parameters to pass both user name and password on the command line, as shown in the following example:

```
ipmitool -I lanplus -H <IPADDR> -U root -P changeme chassis status
```

Note – If you encounter command-syntax problems with your particular operating system, you can use the ipmitool -h command and parameter to determine which parameters can be passed with the ipmitool command on your operating system. Also refer to the IPMItool man page by typing **man ipmitool**.

Note – In the example commands shown in this appendix, the default user name, **root**, and default password, **changeme** are shown. Type the user name and password that has been set for the server.

Enabling the Anonymous User

Note – Enabling anonymous user using IPMItool, is not supported in ILOM 3.0.

To enable the Anonymous/NULL user you must alter the privilege level on that account. This lets you connect without supplying a –U user option on the command line. The default password for this user is **anonymous**.

```
ipmitool -I lanplus -H <IPADDR> -U root -P changeme channel setaccess
1 1 privilege=4
ipmitool -I lanplus -H <IPADDR> -P anonymous user list
```

Changing the Default Password

You can also change the default passwords for a particular user ID. First get a list of users and find the ID for the user you wish to change, and then supply it with a new password, as shown in the following command sequence:

```
ipmitool -I lanplus -H <IPADDR> -U root -P changeme user list
```

```
ID   Name      Callin  Link Auth  IPMI Msg   Channel Priv Limit
1              false   false       true       NO ACCESS
2    root      false   false       true       ADMINISTRATOR
```

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme user set password 2
newpass**

ipmitool -I lanplus -H *<IPADDR>* **-U root -P newpass chassis status**

where *IPADDR* is IP address of the server.

For example:

xxx.xx.xx.xxx.

Using IPMItool to Read Sensors

For more information about supported IPMI 2.0 commands and the sensor naming
for this server, also refer to the Sun *Integrated Lights Out Manager User's Guide* and
the *Integrated Lights-Out Manager Supplement for Sun Blade X6275 Server Module*.

Reading Sensor Status

There are a number of ways to read sensor status, from a broad overview that lists
all sensors, to querying individual sensors and returning detailed information on
them. See the following sections:

- "Reading All Sensors" on page 80
- "Reading Specific Sensors" on page 81

Reading All Sensors

To get a list of all sensors in these servers and their status, use the `sdr list`
command with no arguments. This returns a large table with every sensor in the
system and its status.

The four fields of the output lines, as read from left to right are:

1. IPMI sensor number.

2. IPMI sensor ID.

3. Sensor reading.

4. Sensor status, indicating which thresholds have been exceeded.

For example:

2	|/SYS/SLOTID	| 0x02	| ok
3	|HOSTPOWER	| 0x02	| ok
4	|CMM/PRSNT	| 0x02	| ok
5	|PEM/PRSNT	| 0x02	| ok

Reading Specific Sensors

Although the default output is a long list of sensors, it is possible to refine the output to see only specific sensors. The sdr list command can use an optional argument to limit the output to sensors of a specific type. TABLE 7-1 describes the available sensor arguments.

TABLE 7-1   IPMItool Sensor Arguments

Argument	Description	Sensors
all	All sensor records	All sensors
full	Full sensor records	Temperature, voltage, and fan sensors
compact	Compact sensor records	Digital Discrete: failure and presence sensors
event	Event-only records	Sensors used only for matching with SEL records
mcloc	MC (SP) locator records	SP sensors
generic	Generic locator records	Generic devices: LEDs
fru	FRU locator records	FRU devices

See the following sections:

- "To See Only the Temperature, Voltage, and Fan Sensors" on page 82
- "To See All Fan-Related Sensors" on page 83

▼ To See Only the Temperature, Voltage, and Fan Sensors

1. Use the following command, with the `full` argument:

`ipmitool -I lanplus -H <IPADDR> -U root -P changeme sdr elist full`

14	MB/T_AMB_FRONT	2Ah	ok	7.0	25 degrees C
15	MB/T_AMB_REAR	2Bh	ok	7.1	34 degrees C
16	VPS	2Ch	ok	41.0	115.80 Watts
20	FM0/F0/TACH	6Ch	ok	29.0	5400 RPM
21	FM0/F1/TACH	6Dh	ok	29.0	5400 RPM
22	FM1/F0/TACH	6Eh	ok	29.1	5300 RPM
23	FM1/F1/TACH	6Fh	ok	29.1	5400 RPM
24	FM2/F0/TACH	70h	ok	29.2	5200 RPM
25	FM2/F1/TACH	71h	ok	29.2	5400 RPM
26	FM3/F0/TACH	72h	ok	29.3	5300 RPM
27	FM3/F1/TACH	73h	ok	29.3	5400 RPM
28	FM4/F0/TACH	74h	ok	29.4	5300 RPM
29	FM4/F1/TACH	75h	ok	29.4	5400 RPM
2a	FM5/F0/TACH	76h	ok	29.5	5300 RPM
2b	FM5/F1/TACH	77h	ok	29.5	5400 RPM
2c	FM6/F0/TACH	78h	ns	29.6	Disabled
2d	FM6/F1/TACH	79h	ns	29.6	Disabled
2e	FM7/F0/TACH	7Ah	ns	29.7	Disabled
2f	FM7/F1/TACH	7Bh	ns	29.7	Disabled

Note – In the example above, the `elist` parameter was used rather than `list`. `elist` provides the same information as `list`, with the addition of the entity ID and asserted discrete states.

You can also generate a list of all sensors for a specific Entity. Use the list output to determine which entity you are interested in seeing, then use the sdr entity command to get a list of all sensors for that entity. This command accepts an entity ID and an optional entity instance argument. If an entity instance is not specified, it displays all instances of that entity.

The entity ID is given in the fifth field of the output, as read from left to right. For example, in the output shown in the previous example, all the fans are entity 29. The fan listed (29.5) is entity 29, with instance 5:

```
2a |FM5/F0/TACH      | 76h | ok  | 29.5 | 5300 RPM
```

▼ To See All Fan-Related Sensors

1. Use the following command that uses the entity 29 argument:

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme sdr entity 29**

20	FM0/F0/TACH	6Ch	ok	29.0	5400 RPM
21	FM0/F1/TACH	6Dh	ok	29.0	5400 RPM
22	FM1/F0/TACH	6Eh	ok	29.1	5300 RPM
23	FM1/F1/TACH	6Fh	ok	29.1	5400 RPM
24	FM2/F0/TACH	70h	ok	29.2	5300 RPM
25	FM2/F1/TACH	71h	ok	29.2	5400 RPM
26	FM3/F0/TACH	72h	ok	29.3	5300 RPM
27	FM3/F1/TACH	73h	ok	29.3	5400 RPM
28	FM4/F0/TACH	74h	ok	29.4	5300 RPM
29	FM4/F1/TACH	75h	ok	29.4	5400 RPM
2a	FM5/F0/TACH	76h	ok	29.5	5300 RPM
2b	FM5/F1/TACH	77h	ok	29.5	5400 RPM
2c	FM6/F0/TACH	78h	ok	29.6	Disabled
2d	FM6/F1/TACH	79h	ok	29.6	Disabled
2e	FM7/F0/TACH	7Ah	ok	29.7	Disabled
2f	FM7/F1/TACH	7Bh	ok	29.7	Disabled

Other queries can include a particular type of sensor. The command in the following example returns a list of all Temperature type sensors in the SDR.

```
ipmitool -I lanplus -H <IPADDR> -U root -P changeme sdr type temperature
```

0	MB/T_AMB_FRONT	2Ah	ok	7.0	26 degrees C
0	MB/T_AMB_REAR	2Bh	ok	7.1	35 degrees C

Using IPMItool to View the ILOM SP System Event Log (SEL)

The ILOM SP System Event Log (SEL) provides storage of all system events. You can view the SEL with IPMItool. See the following sections:

Sensor Numbers and Sensor Names in SEL Events

Depending on which IPMI command you use, the sensor number that is displayed for an event might appear in slightly different formats. See the following examples:

- The sensor number for the sensor ps1.prsnt (power supply 1 present) can be displayed as either 1Fh or 0x1F.
- 38h is equivalent to 0x38.
- 4Bh is equivalent to 0x4B.

The output from certain commands might not display the sensor name along with the corresponding sensor number. To see all sensor names in your server mapped to the corresponding sensor numbers, you can use the following command:

```
ipmitool -H 129.144.82.21 -U root -P changeme sdr list
```

/SYS/SLOTID	0x04	ok
HOSTPOWER	0x02	ok
CMM/PRSNT	0x02	ok

```
PEM/PRSNT            | 0x01              | ok

P0/PRSNT             | 0x02              | ok

.........
```

In the sample output above, the sensor name is in the first column and the corresponding sensor number is in the second column.

For a detailed explanation of each sensor, listed by name, refer to the *Integrated Lights Out Manager Supplement For Sun Blade X6275 Server Module*.

Viewing the SEL With IPMItool

There are two different IPMI commands that you can use to see different levels of detail in the SEL.

▼ To View the SEL With IPMItool

1. **View the ILOM SP SEL with a minimal level of detail by using the** sel list **command:**

   ipmitool -I lanplus -H <*IPADDR*> -U root -P changeme sel list

```
13  | 03/06/2009  | 06:31:51  | System Firmware  | Option ROM    | Asserted
                              | Progress         | initialization
14  | 03/06/2009  | 06:31:56  | System Firmware  | Option ROM    | Asserted
                              | Progress         | initialization
15  | 03/06/2009  | 06:32:00  | System Firmware  | System boot   | Asserted
                              | Progress         | initiated
16  | 03/06/2009  | 06:35:12  | Temperature #0x30 | Upper Critical going high
17  | 03/06/2009  | 06:35:20  | Voltage #0x60    | Lower Critical going low
```

Note – When you use this command, an event record gives a sensor number but does not display the name of the sensor for the event. For example, in line 16 in the sample output above, the sensor number 0x30 is displayed. For information about how to map sensor names to the different sensor number formats that might be displayed, see "Sensor Numbers and Sensor Names in SEL Events" on page 84.

View the ILOM SP SEL With a Detailed Event Output by Using the sel elist
Command. The sel elist command cross-references event records with sensor data
records to produce descriptive event output. It takes longer to execute because it
must be read from both the SEL and the Static Data Repository (SDR).

Certain qualifiers are available to refine and limit the SEL output. If you want to see
only the first NUM records, use the first qualifier to the command. If you want to
see the last NUM records, use the last qualifier.

▼ To View the Last Three Records in the SEL

1. Use the sel list command with the last qualifier:

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme sel list last 3**

15	03/06/2009	06:32:00	System Firmware Progress	System boot initiated	Asserted
16	03/06/2009	06:35:12	Temperature #0x30	Upper Critical going high	
17	03/06/2009	06:35:20	Voltage #0x60	Lower Critical going low	

If you want to get more detailed information on a particular event, you can use
the sel get *ID* command, in which you specify an SEL record ID. For example:

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme sel get 0x0a00**

```
SEL Record ID       : 000f

Record Type         : 02

Timestamp           : 03/06/2009 06:31:40

Generator ID        : 0001

EvM Revision        : 04

Sensor Type         : System Firmware Progress

Sensor Number       : 00

Event Type          : Sensor-specific Discrete

Event Direction     : Assertion Event

Event Data          : c20dff

Description         : Management controller initialization
```

In the example above, this particular event describes that the host is currently in the process of booting.

Clearing the SEL With IPMItool

▼ To Clear the SEL

1. Use the `sel clear` **command:**

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme sel clear**

```
Clearing SEL.   Please allow a few seconds to erase.
```

Viewing Component Information With IPMItool

You can view information about system hardware components. The software refers to these components as field-replaceable unit (FRU) devices.

▼ To Read the FRU Inventory Information

On these servers, you must first have the FRU ROMs programmed. After that is done, you can see a full list of the available FRU data by using the `fru print` command, as shown in the following example (only two FRU devices are shown in the example, but all devices would be shown).

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme fru print**

```
FRU Device Description      : Builtin FRU Device (ID 0)

Product Manufacturer        : SUN MICROSYSTEMS

Product Name                : ILOM INTEGRATED SP
```

```
FRU Device Description      : SP/NET0 (ID 1)

Product Manufacturer        : ASPEED

Product Name                : ETHERNET CONTROLLER

Product Part Number         : AST2100

Product Serial              : 00:14:4f:ca:2f:21

Product Extra               : 01

Product Extra               : 00:14:4f:ca:2f:21

.......
```

Viewing Status LEDs

In these servers, the SP is responsible for the I2C commands that control the LEDs.

▼ To Get a List of LEDs and Their Status

1. Use the following command:

ipmitool -I lanplus -H *<IPADDR>* **-U root -P changeme sunoem led get all**

Here are sample results:

```
OK                  |  ON

OK2RM               |  OFF

SERVICE             |  OFF

LOCATE              |  OFF

P0/SERVICE          |  OFF

P0/D0/SERVICE       |  OFF

P0/D1/SERVICE       |  OFF

P0/D2/SERVICE       |  OFF

P0/D3/SERVICE       |  OFF

P0/D4/SERVICE       |  OFF

P0/D5/SERVICE       |  OFF
```

```
P1/SERVICE          | na
P1/D0/SERVICE       | na
P1/D1/SERVICE       | na
P1/D2/SERVICE       | na
P1/D3/SERVICE       | na
P1/D4/SERVICE       | na
P1/D5/SERVICE       | na
```

BIOS Power-On Self-Test (POST) Codes

The system BIOS provides a basic power-on self-test (POST), during which the BIOS checks the basic devices required for the server to operate. The progress of the self-test is indicated by a series of POST codes. This chapter explains the BIOS POST testing, provides an alternate method for viewing the codes, describes how to change POST options, and lists the POST codes.

This chapter contains the following sections:

About POST

The POST is a systematic check of basic system devices. As the testing progresses, the BIOS displays codes that you can use to interpret the status of your server. The codes appear at the bottom right corner of the system's VGA screen, after the self-test has progressed far enough to initialize the video monitor. Because the codes might scroll off of the screen too quickly to be read, an alternate method of displaying POST codes is to redirect the output of the console to a serial port (see "Redirecting Console Output" on page 92).

You can also see some of the post codes on LEDs inside the front panel of your server node (see "POST Code LEDs" on page 100).

How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is shadowed (that is, copied from ROM to DRAM).

2. Once executing out of DRAM, the BIOS performs a simple memory test (a write/read of every location with the pattern `55aa55aa`).

Note – This memory test is performed only if Quick Boot is *not* enabled from the Boot Settings Configuration screen. Enabling Quick Boot causes the BIOS to skip the memory test. See "Changing POST Options" on page 93 for more information.

---

3. The BIOS polls the memory controllers for both correctable and non-correctable memory errors and logs those errors into the SP.

4. The message `BMC Responding` appears at the end of POST.

Redirecting Console Output

You can access BIOS POST codes remotely using the web interface or the CLI.

▼ To Access BIOS POST Codes Using the Web Interface

1. **Open a browser and use the SP's IP address as the URL.**

   Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) for information on how to obtain the IP address of the SP.

2. **Type a user name and password as follows:**

   User name: **root**
   Password: **changeme**

3. **The ILOM SP web interface screen appears.**

4. **Click the Remote Control tab.**

5. **Click the Redirection tab.**

6. **Click the Start Redirection button.**

   The javaRConsole window appears and prompts you for your user name and password again, then the current POST screen appears.

▼ To Access BIOS POST Codes Using the CLI

1. **Log in to the SP cli with the command** `ssh root@<`*SP IP address*`>` **and use the command** `start /SP/console` **to start the serial console.**

Changing POST Options

These instructions are optional, but you can use them to change the operations that the server performs during POST testing.

▼ To Change the POST Options

1. **Initialize the BIOS Setup Utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   The BIOS Main Menu screen appears.

2. **Select the Boot menu.**

   The Boot Settings screen appears.

3. **Select Boot Settings Configuration.**

   The Boot Settings Configuration screen appears.

4. **On the Boot Settings Configuration screen, there are several options that you can enable or disable:**

   - **Retry Boot List:** Automatically retries the boot list when all devices have failed. This option is enabled by default.

   - **Quick Boot:** This option is enabled by default. The BIOS skips certain tests while booting, such as the extensive memory test. This decreases the time it takes for the system to boot.

   - **Quiet Boot:** This option is disabled by default. If you enable this option, the Sun Microsystems logo appears instead of POST codes.

- **Wait for F1 if Error:** This option is enabled by default. The system pauses if an error is found during POST and only resumes when you press the F1 key.
- **On-board IB gPXE Boot First:** Sets the on-board infiniband gPXE to always boot first. This option is disabled by default.

POST Codes

TABLE 8-1 contains descriptions of each of the POST codes, listed in the same order in which they are generated. These POST codes appear at the bottom right of the BIOS screen as a four-digit string that is a combination of two-digit output from primary I/O port 80 and two-digit output from secondary I/O port 81. In the POST codes listed in TABLE 8-1, the first two digits are from port 81 and the last two digits are from port 80.

You can see some of the POST codes from primary I/O port 80 on LEDs inside the front panel of your server node (see "POST Code LEDs" on page 100).

The Response column describes the action taken by the system on encountering the corresponding error. The actions are:

- **Warning** or **Not an Error** – The message appears on the screen. An error record is logged to the system event log (SEL). The system continues booting with a degraded state. The user might want to replace the unit.
- **Pause** – The message appears on the screen, an error is logged to the SEL, and user input is required to continue. The user can take immediate corrective action or choose to continue booting.
- **Halt** – The message appears on the screen, an error is logged to the SEL, and the system cannot boot unless the error is resolved. The user needs to replace the faulty part and restart the system.

TABLE 8-1   Error Messages and Responses

Error Code	Error Message	Response
0000	Timer Error	Pause
0003	CMOS Battery Low	Pause
0004	CMOS Settings Wrong	Pause
0005	CMOS Checksum Bad	Pause
000B	CMOS Memory Size Wrong	Pause
000C	RAM R/W Test Failed	Pause
000E	A: Drive Error	Pause

TABLE 8-1   Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
000F	B: Drive Error	Pause
0012	CMOS Date/Time Not Set	Pause
0040	Refresh Timer Test Failed	Halt
0041	Display Memory Test Failed	Pause
0042	CMOS Display Type Wrong	Pause
0043	~<INS> Pressed	Pause
0044	DMA Controller Error	Halt
0045	DMA-1 Error	Halt
0046	DMA-2 Error	Halt
0047	Unknown BIOS error. Error code = 0047	Halt
0048	Password Check Failed	Halt
0049	Unknown BIOS error. Error code = 0049	Halt
004A	Unknown BIOS error. Error code = 004A	Pause
004B	Unknown BIOS error. Error code = 004B	Pause
004C	Keyboard/Interface Error	
005D	S.M.A.R.T. Command Failed	
005E	Password Check Failed	Pause
0101	Warning! This system board does not support the power requirements of the installed processor. The processor will be run at a reduced frequency, which will impact system performance.	Pause
0102	Error! The CPU Core to Bus ratio or VID configuration has failed! Please enter BIOS Setup and re-config it.	Pause
0103	ERROR! CPU MTRRs configuration failed! Uncacheable memory hole or PCI space too complicated.	
0120	Thermal Trip Failure	Pause
0121	Thermal Trip Failure	Pause
0122	Thermal Trip Failure	Pause
0123	Thermal Trip Failure	Pause
0124	Thermal Trip Failure	Pause
0125	Thermal Trip Failure	Pause
0126	Thermal Trip Failure	Pause
0127	Thermal Trip Failure	Pause

TABLE 8-1 Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
0128	Thermal Trip Failure	
0129	Thermal Trip Failure	
012A	Thermal Trip Failure	
012B	Thermal Trip Failure	
012C	Thermal Trip Failure	
012D	Thermal Trip Failure	
012E	Thermal Trip Failure	
012F	Thermal Trip Failure	
0150	Processor Failed BIST	Pause
0151	Processor Failed BIST	Pause
0152	Processor Failed BIST	Pause
0153	Processor Failed BIST	Pause
0154	Processor Failed BIST	Pause
0155	Processor Failed BIST	Pause
0156	Processor Failed BIST	Pause
0157	Processor Failed BIST	Pause
0158	Processor Failed BIST	
0159	Processor Failed BIST	
015A	Processor Failed BIST	
015B	Processor Failed BIST	
015C	Processor Failed BIST	
015D	Processor Failed BIST	
015E	Processor Failed BIST	
015F	Processor Failed BIST	
0160	Processor missing microcode	Pause
0161	Processor missing microcode	Pause
0162	Processor missing microcode	Pause
0163	Processor missing microcode	Pause
0164	Processor missing microcode	Pause
0165	Processor missing microcode	Pause

TABLE 8-1 Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
0166	Processor missing microcode	Pause
0167	Processor missing microcode	Pause
0168	Processor missing microcode	
0169	Processor missing microcode	
016A	Processor missing microcode	
016B	Processor missing microcode	
016C	Processor missing microcode	
016D	Processor missing microcode	
016E	Processor missing microcode	
016F	Processor missing microcode	
0180	BIOS does not support current stepping	Pause
0181	BIOS does not support current stepping	Pause
0182	BIOS does not support current stepping	Pause
0183	BIOS does not support current stepping	Pause
0184	BIOS does not support current stepping	Pause
0185	BIOS does not support current stepping	Pause
0186	BIOS does not support current stepping	Pause
0187	BIOS does not support current stepping	Pause
0188	BIOS does not support current stepping	
0189	BIOS does not support current stepping	
018A	BIOS does not support current stepping	
018B	BIOS does not support current stepping	
018C	BIOS does not support current stepping	
018D	BIOS does not support current stepping	
018E	BIOS does not support current stepping	
018F	BIOS does not support current stepping	
0192	L2 cache size mismatch.	
0193	CPUID, Processor stepping are different.	
0194	CPUID, Processor family are different.	Pause
0195	Front side bus mismatch. System halted.	

TABLE 8-1 Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
0196	CPUID, Processor Model are different.	Pause
0197	Processor speeds mismatched.	Pause
5120	CMOS cleared by jumper.	Pause
5121	Password cleared by jumper.	Pause
5125	Not enough conventional memory to copy PCI Option ROM.	
5180	Unsupported Memory Vendor : DIMM_A0	Warning
5181	Unsupported Memory Vendor : DIMM_A1	Warning
5182	Unsupported Memory Vendor : DIMM_A2	Warning
5183	Unsupported Memory Vendor : DIMM_A3	Warning
5184	Unsupported Memory Vendor : DIMM_A4	
5185	Unsupported Memory Vendor : DIMM_B0	Warning
5186	Unsupported Memory Vendor : DIMM_B1	Warning
5187	Unsupported Memory Vendor : DIMM_B2	Warning
5188	Unsupported Memory Vendor : DIMM_B3	Warning
5189	Unsupported Memory Vendor : DIMM_B4	Warning
518A	Unsupported Memory Vendor : DIMM_B5	Warning
518B	Unsupported Memory Vendor : DIMM_C0	Warning
518C	Unsupported Memory Vendor : DIMM_C1	Warning
518D	Unsupported Memory Vendor : DIMM_C2	Warning
518F	Unsupported Memory Vendor : DIMM_C3	Warning
5190	Unsupported Memory Vendor : DIMM_C4	Warning
5191	Unsupported Memory Vendor : DIMM_C5	Warning
5192	Unsupported Memory Vendor : DIMM_D0	Warning
5193	Unsupported Memory Vendor : DIMM_D1	Warning
5194	Unsupported Memory Vendor : DIMM_D2	Warning
5195	Unsupported Memory Vendor : DIMM_D3	Warning
5196	Unsupported Memory Vendor : DIMM_D4	Warning
5197	Unsupported Memory Vendor : DIMM_D5	Warning
51A0	Unsupported AMB Vendor : DIMM_A0	Warning
51A1	Unsupported AMB Vendor : DIMM_A1	Warning

TABLE 8-1 Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
51A2	Unsupported AMB Vendor : DIMM_A2	Warning
51A3	Unsupported AMB Vendor : DIMM_A3	Warning
51A4	Unsupported AMB Vendor : DIMM_A4	Warning
51A5	Unsupported AMB Vendor : DIMM_A5	Warning
51A6	Unsupported AMB Vendor : DIMM_B0	Warning
51A7	Unsupported AMB Vendor : DIMM_B1	Warning
51A8	Unsupported AMB Vendor : DIMM_B2	Pause
51A9	Unsupported AMB Vendor : DIMM_B3	Warning
51AA	Unsupported AMB Vendor : DIMM_B4	Warning
51AB	Unsupported AMB Vendor : DIMM_B5	Warning
51AC	Unsupported AMB Vendor : DIMM_C0	Warning
51AD	Unsupported AMB Vendor : DIMM_C1	Pause
51AE	Unsupported AMB Vendor : DIMM_C2	Warning
51AF	Unsupported AMB Vendor : DIMM_C3	Pause
51B0	Unsupported AMB Vendor : DIMM_C4	Pause
51B1	Unsupported AMB Vendor : DIMM_C5	Pause
51B2	Unsupported AMB Vendor : DIMM_D0	
51B3	Unsupported AMB Vendor : DIMM_D1	
51B4	Unsupported AMB Vendor : DIMM_D2	
51B5	Unsupported AMB Vendor : DIMM_D3	
51B6	Unsupported AMB Vendor : DIMM_D4	
51B7	Unsupported AMB Vendor : DIMM_D5	
51C0	Memory Configuration Error.	
8101	Warning! USB Host Controller not found at the specified address!!!	
8102	Error! USB device failed to initialize!!!	
8104	Warning! Port 60h/64h emulation is not supported by this USB Host Controller!!!	
8105	Warning! EHCI controller disabled. It requires 64bit data support in the BIOS.	
8301	Not enough space in runtime area. SMBIOS data will not be available.	

TABLE 8-1   Error Messages and Responses *(Continued)*

Error Code	Error Message	Response
8302	Not enough space in runtime area. SMBIOS data will not be available.	
8601	Error: BMC Not Responding	
8701	Insufficient Runtime space for MPS data.!. System may operate in PIC or Non-MPS mode.	

POST Code LEDs

Two LEDs inside the front cover of your server node display the same two-digit POST code output from primary I/O port 80 that is shown on the BIOS screen (the right-most two digits on the lower right of the BIOS screen are the POST code from primary I/O port 80).

In general, the POST codes change so rapidly that you cannot distinguish individual digits. Some POST tests take enough time (or pause or stop), however, so that they might be readable if you look at the LEDs through the front panel. Such codes are listed in TABLE 8-2.

TABLE 8-2   POST Codes on the Front Panel LEDs That Might Be Readable

Code	Meaning
4F	Initializing IPMI BT interface.
D4	Testing base memory; system might hang if test fails.
D5	Copying Boot Block to RAM and transferring control to RAM.
38	Initializing different devices through DIM (Device Initialization Manager). For example, USB controllers are initialized at this point.
75	Initializing Int-13 and preparing for IPL detection.
78	Initializing IPL devices controlled by BIOS and option ROMs.
85	Displaying errors to the user and getting the user response for error.

TABLE 8-2 POST Codes on the Front Panel LEDs That Might Be Readable

Code	Meaning
87	Executing BIOS setup if needed / requested. Checking boot password if installed.
00	Passing control to OS Loader (typically INT19h).
FF	The flash has been updated successfully. Making flash write disabled. Disabling ATAPI hardware. Restoring CPUID value back into register. Giving control to F000 ROM at F000:FFF0h.

Note – For each cold boot (such as when a blade is re-seated into the chassis), POST testing begins to run and detects system resources for a short while. After just a few POST codes, the node is turned off or restarted depending on the selected state in the BIOS for AC Power Loss (Always On, Always Off, or Last State).

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