Third Party System Management Integration Solution

Oracle® Hardware Management Connector 1.4 for IBM Tivoli Netcool/OMNIbus

A complete list of currently supported servers, service processors, and service processor firmware is available at the following web site:

http://www.sun.com/system-management/tools.jsp

Please consult this web site before configuring the Oracle Hardware Management Connector for IBM Tivoli Netcool/OMNIbus.

Part No. 820-2776-14

August 2010, Revision A

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CHAPTER 1

Preface

The Oracle Hardware Management Connector for IBM Tivoli Netcool/OMNIbus (Oracle HMC for Netcool/OMNIbus) enables you to integrate your Oracle Sun servers and Blade modules into an IBM Tivoli Netcool/OMNIbus (Netcool/OMNIbus) environment. This document explains how to install and configure the Oracle HMC for Netcool/OMNIbus.

How this Document is Organized

This document contains the following sections:

- Introduction provides an overview of the Oracle HMC for Netcool/OMNIbus
- Installing Oracle HMC for Netcool/OMNIbus explains how to install and uninstall Oracle HMC for Netcool/OMNIbus
- Configuring Monitored Devices explains how to configure your servers so that you can monitor them using Netcool/OMNIbus
- Monitoring Sun Devices in Netcool/OMNIbus provides a overview of the information available after installing Oracle HMC for Netcool/OMNIbus

This document is intended for experienced IT professionals, field sales representatives and support engineers.

Typographic Conventions

The following typographic conventions are used in this document:

Typeface	Meaning	Example
`AaBbCc1234`	The names of commands and packages; on-screen output.	`/etc/initrd`
AaBbCc1234	Hyperlink to an external web site.	www.oracle.com
<*AaBbCc1234*>	Variable data	<*version*>

Typeface	Meaning	Example
AaBbCc1234	Cross reference within this document.	See Installing for more information.
\	Used to split lines that are too wide for this document	This is all \ one line

Terms and Definitions

The following terms are used in this manual:

Term	Definition
ALOM	Advanced Lights Out Manager
ILOM	Integrated Lights Out Manager
LOM	Lights Out Manager
MASF	Sun SNMP Management Agent
MIB	Management Information Base
SP	Service Processor
SNMP	Simple Network Management Protocol

CHAPTER 2

Introduction

The Oracle HMC for Netcool/OMNIbus extends the capabilities of Netcool/OMNIbus and provides the following features:

- Alerts from Sun servers and service processors are clearly identified by source.
- Support of the Sun Server Hardware Management Agent provides in-band hardware event monitoring. Currently supported operating systems include Solaris x86, Red Hat Enterprise Linux, SUSE Linux Enterprise Server and VMware ESX Server.
- Rules for displaying and prioritizing alerts received from multiple sources.
- Support of the SUN-HW-TRAP-MIB (available for ILOM 2.x and ILOM 3.x service processors) provides more robust support for reporting device names and changes to device status.
- Support of the Sun SNMP Management Agent for Sun Fire and Netra Systems provides support for additional varbinds (variable binding pairs consisting of OIDs and values).
- Automatic clearing of problem events received from supported Sun servers and service processors when a resolution event is received.
- Support of the Sun Automatic Service Request (ASR) software, which provides auto case generation when specific hardware faults occur.

With the Oracle HMC for Netcool/OMNIbus integrated with Netcool/OMNIbus, you can view messages from multiple Sun servers.

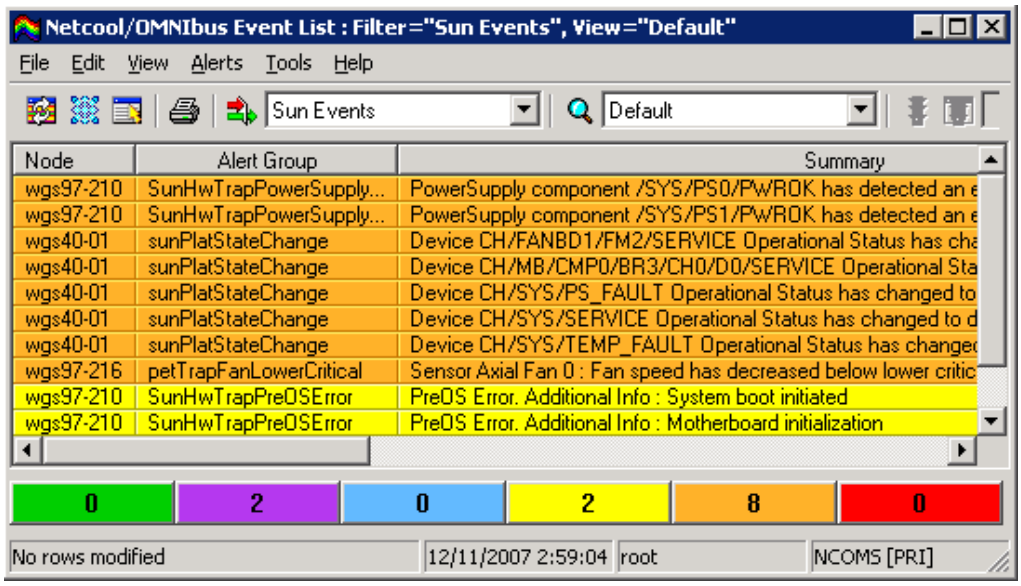

Figure 1: Event List

Figure 1 shows messages received from a Sun x86 server with an ILOM service processor (wgs97-210), a Sun SPARC server with an ALOM service processor (wgs40-01), and a Sun x86 server with an Embedded LOM service processor (wgs97-216).

Levels of Integration with Netcool/OMNIbus

The Oracle HMC for Netcool/OMNIbus uses SNMP as its integration protocol at both the operating system and service processor level. You do not need to install any Netcool/OMNIbus component on your Sun servers to be able to monitor them. Different Sun servers provide different options for monitoring, depending on the types of Sun servers that you plan to monitor with Netcool/OMNIbus. The following table lists the various options available.

Servers	Integration	Description
x86/ILOM running Solaris or a supported Linux	Sun Server Hardware Management Agent	The Sun Server Hardware Management Agent should be installed on a Sun x86/ILOM server running a supported operating system and configured to send SNMP traps to the server on which MTTrapd Probe is installed. The Sun Hardware Agent sends traps defined in the following SNMP MIB: - `SUN-HW-TRAP-MIB`

Servers	Integration	Description
x86/ILOM and x86/Embedded LOM Servers	SNMP SP	The ILOM 2.x, ILOM 3.x and Embedded LOM service processors send the Netcool Universal SNMP Probe (hereafter MTTrapd Probe) alerts defined by one of the following SNMP MIBs: - SUN-HW-TRAP-MIB (ILOM) - SUN-ILOM-PET-EVENTS (Embedded LOM) To enable this integration, you do not need to install any Netcool/OMNIbus-specific agents on the monitored devices. You do need to configure SNMP on the managed device to use the server on which the MTTrapd Probe is installed as a trap destination.
SPARC/ILOM Servers	SNMP SP	ILOM 2.x and ILOM 3.x service processors send the MTTrapd Probe alerts defined by the following SNMP MIB: - SUN-HW-TRAP-MIB To enable this integration, you do not need to install any Netcool/OMNIbus-specific agents on the monitored devices. You do need to configure SNMP on the managed device to use the server on which the MTTrapd Probe is installed as a trap destination.
SPARC/ALOM Servers	SNMP OS	The software component Sun SNMP Management Agent for Sun Fire and Netra Systems should be installed on SPARC/Solaris systems and must be configured to send traps/alerts to the server on which the MTTrapd Probe is installed (with proper SNMP port information). This SNMP Agent sends Netcool/OMNIbus SNMP Universal Agent SNMP Manager traps defined by the following SNMP MIB: - SUN-PLATFORM-MIB

Note - you are recommended to upgrade the firmware on your service processors if they are currently running a previous version.

To implement SNMP integration at either the operating system or service processor level, you must verify that the devices you want to manage are configured with the appropriate port and server information for the server running the MTTrapd Probe as one of its trap destinations and that they are able to communicate with the server running the MTTrapd Probe.

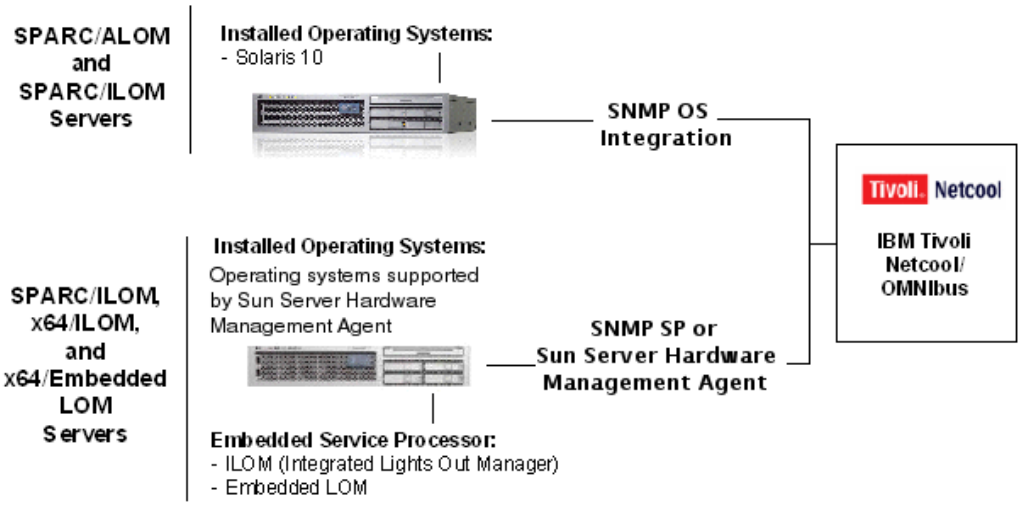

Figure 2: Sun Device Monitoring Options

As seen in Figure 2, the monitoring options available depend on whether you want to use service processor level monitoring or operating system level monitoring, as well as the type of service processor.

Prerequisites

The managed devices and the Netcool/OMNIbus server have different software requirements.

Managed Devices Requirements

Managed devices (Sun servers, Blade modules and service processors) must have the correct software installed and be configured properly. A complete, current list of supported Sun servers, service processors, and service processor firmware is available at the following web site:

http://www.sun.com/system-management/tools.jsp

Please consult this web site before installing the Oracle HMC for Netcool/OMNIbus.

The following table provides an overview of the available monitoring methods and their software requirements.

Device	Software Requirement
SPARC/ILOM and x86/ILOM service processors	Oracle Integrated Lights Out Manager (ILOM) firmware version 2.0 and 3.0 or higher No Netcool/OMNIbus agents are required on the managed device.
x86/ILOM to be monitored from the host operating system	Sun Server Hardware Management Agents
x86/Embedded LOM service processors	Sun Embedded LOM firmware Version 2.91 or higher No Netcool/OMNIbus agents are required on the managed device.
SPARC/ALOM and SPARC/ILOM Servers	Supported operating systems: - Solaris 10 (see product documentation for versions) Sun SNMP Management Agent for Sun Fire and Netra Systems installed and configured No Netcool/OMNIbus agents are required on the managed device.

Netcool/OMNIbus Server Requirements

For all supported Sun servers you must have Netcool/OMNIbus version v7.1 or higher installed. Make sure that you know the name of the host server on which Netcool/OMNIbus has been installed and configured.

You need the following privileges for the server on which the MTTrapd Probe is installed:

- Log in access (root or otherwise)
- Write permissions

Verify that you have installed the Netcool Knowledge Library Lite Probe Rules V1.3.

Related Documentation

For information about Sun Server Management Solutions, Sun servers, and IBM Tivoli, consult the following related documentation:

- Sun SNMP Management Agent Administration Guide for Sun Fire and Netra Servers (819-7978)
- Oracle Integrated Lights Out Manager User s Guide
- Sun Server Hardware Management Pack documentation
- Netcool/OMNIbus Installation and Deployment Guide
- Netcool/OMNIbus User Guide
- Netcool/OMNIbus Administration Guide
- Netcool/OMNIbus Probe and Gateway Guide
- Netcool/OMNIbus Online Help

For documentation on the Sun Embedded Lights Out Manager, consult the product documentation that ships with your particular x86/Embedded LOM server.

CHAPTER 3

Installing Oracle HMC for Netcool/OMNIbus

This section describes how to install and uninstall the Oracle HMC for Netcool/OMNIbus. This section contains the following:

Getting Oracle HMC for Netcool/OMNIbus

Before you start, make sure you have downloaded the latest Oracle HMC for Netcool/OMNIbus distribution archive from:

http://www.sun.com/system-management/tools.jsp

This package contains the files necessary to install the Oracle HMC for Netcool/OMNIbus. Before you can install the Oracle HMC for Netcool/OMNIbus on your Netcool/OMNIbus server, you must first unpack the distribution archive.

Installing Oracle HMC for Netcool/OMNIbus

Once you have downloaded and unpacked the distribution archive to a local temporary directory, you have to copy the relevant files to the directory on the management server that contains the Netcool/OMNIbus rules and lookup files. This section provides the paths you copy the files to.

Your Netcool installation should have the *NC_RULES_HOME* environmental variable set to the rules file directory, see the Netcool documentation for more information. This procedure uses the location of *NC_RULES_HOME* as the base path for storing the Oracle HMC for Netcool/OMNIbus files.

All of the SNMP trap based rule files provided as part of the Oracle HMC for Netcool/OMNIbus for are placed in the following directory:

NC_RULES_HOME\include-snmptrap\sun

All lookup files are placed in the following directory:

NC_RULES_HOME\include-snmptrap\common-lookup

The following procedure explains how to copy the files to the correct directories.

▶ To install the Oracle HMC for Netcool/OMNIbus:

1. Navigate to the *NC_RULES_HOME*\include-snmptrap directory and create a sun directory to place all Sun specific rules files.

Note - if the include-snmptrap directory does not exist you can manually create the directory.

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2. Navigate to the SOFTWARE subdirectory that was created when you unpacked Oracle HMC for Netcool/OMNIbus. This directory contains files suffixed with .rules and .lookup.
3. Copy all Sun specific rules files, suffixed with .rules, from the SOFTWARE subdirectory into the following directory:

   NC_RULES_HOME\include-snmptrap\sun
4. Copy all Sun specific lookup files, .suffixed with .lookup, into the following directory:

   NC_RULES_HOME\include-snmptrap\common-lookup
5. Verify that the .rules and .lookup files have been copied successfully.

The following sections explain how to integrate these files with your existing Netcool/OMNIbus rules and lookup files.

Configuring Oracle HMC for Netcool/OMNIbus

Once you have copied the rules and lookup files, you must integrate the rules contained in the Oracle HMC for Netcool/OMNIbus with the existing rules on your Netcool/OMNIbus management server. Typically, MTTrapd Probe rules files contain a section for lookup file references and a section for rules file references.

Note - The following steps assume that you have the Netcool Knowledge Library Lite Probe Rules installed. If you use an alternate knowledge library or alternate rules files, please consult the related documentation as these steps may require slight modifications.

Configuration Procedure

The following procedure explains how to modify your MTTrapd Probe file to integrate the Oracle HMC for Netcool/OMNIbus lookup and rules files, which enables you to receive and interpret SNMP traps.

▶ To configure your MTTrapd Probe file:

1. Open the MTTrapd Probe rules file in a text editor.

   The default name for this rules file is `mttrapd.rules.`

Note - the rules file may not necessarily be mttrapd.rules, this depends on the settings in mttrapd.props.

2. Add the following statement at the beginning of the file, before any processing statements:

   ```
   array pet;
   ```

   This array gets used by the following rules file:

   ```
   wiredformgmt-SUN-ILOM-PET-MIB.include.snmptrap.rules
   ```

Note - array statements must be defined at the beginning of rules files, preceding any processing statements.

3. Add the following include statements to the beginning of the file where most lookup file references are located:

   ```
   ######################################################
   # Added for Sun-Netcool Integration Pack - Beginning
   ######################################################

   include "$NC_RULES_HOME/include-snmptrap/common\
   -lookup/sun-hextoascii.include.snmptrap.lookup"
   ```

4. Add the following lines toward the end of the section of the file where most rules file references are located:

   ```
   ######################################################
   # Added for Sun-Netcool Integration Pack - Beginning
   ######################################################

   include "$NC_RULES_HOME/include-snmptrap/sun/\
   wiredformgmt-SUN-ILOM-PET-MIB.include.snmptrap.\
   rules"
   ```

```
include "$NC_RULES_HOME/include-snmptrap/sun/sun\
-SUN-HW-TRAP-MIB.include.snmptrap.rules"

include "$NC_RULES_HOME/include-snmptrap/sun/sun\
-SUN-PLATFORM-MIB.include.snmptrap.rules"

include "$NC_RULES_HOME/include-snmptrap/sun/sun\
-SUN-ASR-NOTIFICATION-MIB.include.snmptrap.rules"

#########################################################
```

5. Save the `mttrapd.rules` file.
6. Restart Mttrapd so that the modified `mttrapd.rules` file is re-read.

The MTTrapd Probe is configured to receive and interpret SNMP traps from supported Sun servers.

Uninstalling Oracle HMC for Netcool/OMNIbus

The procedure to uninstall the Oracle HMC for Netcool/OMNIbus is the reverse of the configuration procedure. Please refer to the install instructions and revert the changes made in the MTTrapd Probe file.

CHAPTER 4

Configuring Monitored Devices

This section describes how to configure your Sun devices to be monitored by Netcool/OMNIbus. This section contains the following:

Choosing a Configuration Procedure

The steps required for configuring a Sun server to be monitored depend on the type of service processor that the Sun server provides. The following table provides an overview of the possibilities.

Sun Server	Configuration Task
SPARC/ALOM and SPARC/ILOM Servers	Configure the Sun SNMP Management Agent for Sun Fire and Netra Systems
SPARC/ILOM, x86/ILOM, and x86/Embedded LOM Service Processors	Enable and configure SNMP on the ILOM or Embedded LOM service processor
x86/ILOM	Enable and configure the Sun Server Hardware Management Agent

Note - you can monitor SPARC/ILOM servers at either the operating system level or at the service processor level. Configure the Sun SNMP Management Agent for Sun Fire and Netra Systems on your SPARC/ILOM servers only if you want to monitor them at the operating system level. You can monitor x86/ILOM servers at either the operating system level or at the service processor level. Configure the Sun Server Hardware Management Agent on your x86/ILOM servers only if you want to monitor them at the operating system level.

Configuring SPARC/ALOM and SPARC/ILOM

To monitor supported SPARC servers at the operating system level in Netcool/OMNIbus, you must configure SNMP on those devices to send traps to the MTTrapd Probe. The MTTrapd Probe then forwards these traps to the Netcool/OMNIbus ObjectServer.

SPARC Solaris SNMP Configuration

If you want Netcool/OMNIbus to use operating system (OS) based SNMP to monitor your SPARC Solaris servers, the Sun SNMP Management Agent for Sun Fire and Netra Systems (hereafter Sun SNMP Management Agent) must be installed and configured on each of these SPARC Solaris nodes.

Installation

To evaluate SNMP system requirements for your SPARC Solaris server and to learn how to install the Sun SNMP Management Agent on it, consult the following Sun manual:

Sun SNMP Management Agent Administration Guide for Sun Fire and Netra Servers (Part Number 819-7978)

You can download this manual from:

http://docs.sun.com

Configuration

For integration between the Sun SNMP Management Agent and Netcool/OMNIbus to work correctly, you must verify that the Sun SNMP Management Agent configuration file on your managed SPARC Solaris nodes is correctly configured.

▶ To configure the Sun SNMP Management Agent configuration file:

1. On the managed server, open the following configuration file in a text editor:

   `/etc/opt/SUNWmasf/conf/snmpd.conf`

2. Add an entry to specify whether you want to send SNMP v1 or SNMP v2 traps. Depending on the version of SNMP you are using, choose one of these possibilities:

SNMP format	Entry
v1	`trapsink <destination_hostname> <community> <port>`
v2c	`trap2sink <destination_hostname> <community> <port>`

   where <*destination_hostname*> specifies the name or IP address of the destination server receiving the SNMP v1 (trapsink) or v2c (trap2sink) traps from the Sun SNMP Management Agent.

Note - do not add both lines. Adding both lines results in the Sun SNMP Management Agent sending Netcool/OMNIbus two traps for each alert and those redundant alerts appearing in the event console.

3. (**Optional but recommended**)

   Uncomment the following line in the final section of the file, by removing the #:

```
#####################################################
# SECTION: Trap compatibility mode
. . .
SUNW_alwaysIncludeEntPhysName   yes
```

   Enabling this mode for the Sun SNMP Management Agent adds more detailed sensor and device names to traps and eliminates the need for generic messages for some sensors such as A device has been disabled.

Note - this step is not applicable if you are using Sun SNMP Management Agent version 1.6.

4. Save the modified `snmpd.conf` file.

   For these changes to take effect, you must force the Sun SNMP Management Agent to re-read the configuration file. Enter the following commands in a terminal window to force the Sun SNMP Management Agent to re-read its configuration file:

```
ps -ef | grep SUNWmasf | grep -v grep
```

   You can use the following command to return the process ID of the Sun SNMP Management Agent daemon running on your SPARC Solaris system.

```
kill -HUP <snmpd_pid>
```

   where <*snmpd_pid*> is the process ID of the Sun SNMP Management Agent obtained in the previous sub-step. The Sun SNMP Management Agent re-reads its configuration file automatically when it restarts.

Your managed SPARC Solaris servers are now ready to forward traps to Netcool/OMNIbus.

Configuring Sun Server Hardware Management Agent

Sun x86/ILOM servers can be monitored at the operating system level using the Sun Server Hardware Management Agent, which runs on the host operating system. Supported operating systems include Solaris x86, Red Hat Enterprise Linux, SUSE Linux Enterprise Server and VMware ESX Server. For

more information on how to install and configure the Sun Server Hardware Management Agent, please refer to the Sun Server Hardware Management Pack documentation.

Configuring ILOM and Embedded LOM Service Processors

For a SPARC/ILOM, x86/ILOM, or x86/Embedded LOM service processor to be monitored by Netcool/OMNIbus, you must configure SNMP on the service processor.

Configuring Sun ILOM 2.x and 3.x Service Processors

ILOM must be configured to send SNMP traps to the correct destination. In this case the destination is the server where the MTTrapd is running.

▶ To configure SNMP protocol settings on your Sun ILOM service processor:

1. Launch the web GUI (ILOM) on the service processor to be configured and monitored.
2. Log in to the ILOM graphical interface as root.
3. Click **Configuration >Alert Management.**

   The Alert Management opens.

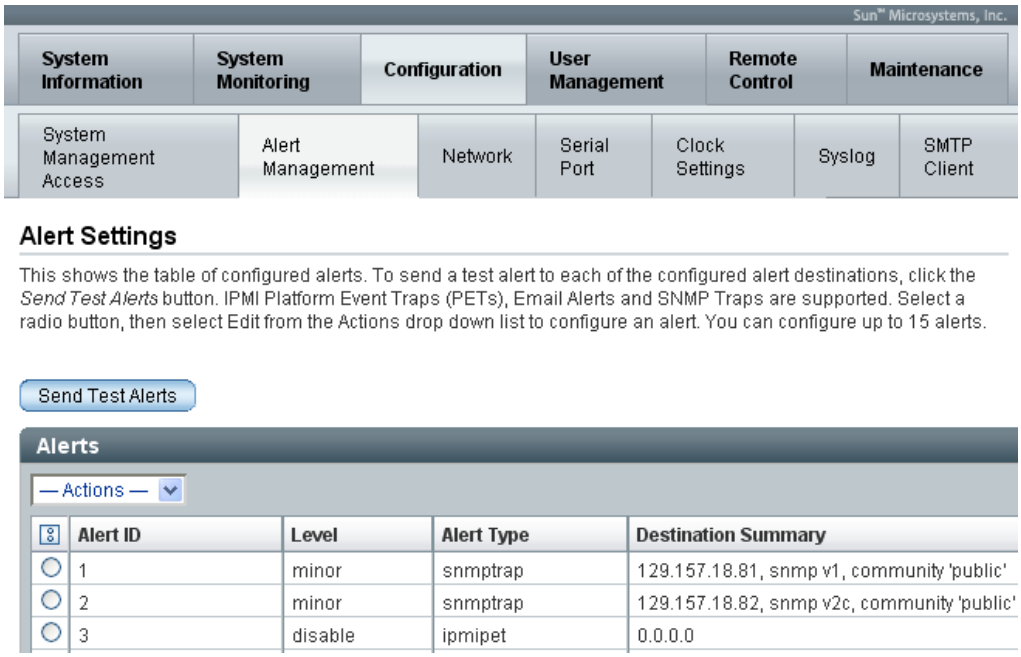

Figure 3: ILOM Alert Management

4. Click one of checkboxes for an entry that has no value for **Destination Summary**.

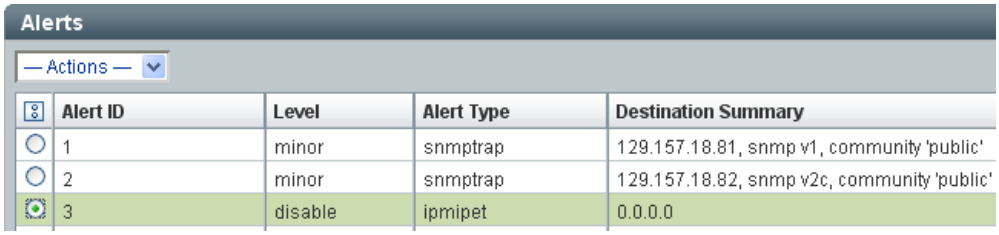

Figure 4: Choosing an Alert to Edit

5. From the **Actions** drop-down, choose **Edit**.

   The ILOM alert's settings open.

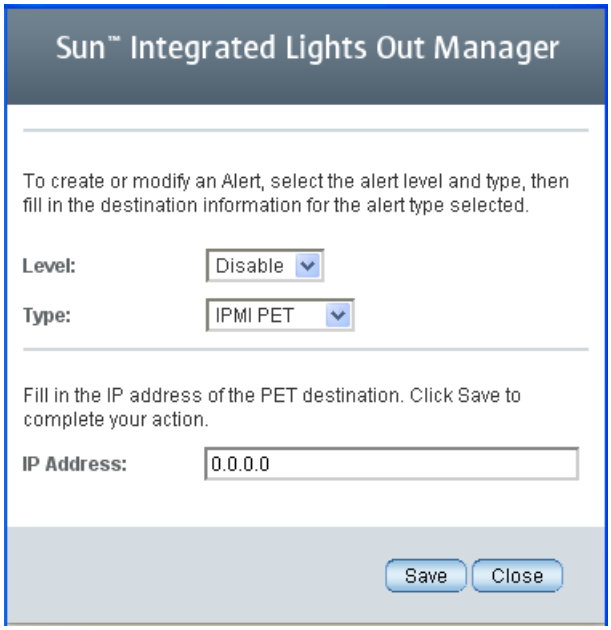

Figure 5: ILOM Alert Settings

6. Verify or set the following parameters.

Parameter	Value
Level	Minor (to view the maximum number of traps at all severity levels)
Type	SNMP Trap (for the `SUN-HW-TRAP-MIB`)
IP Address	IP_address_of_destination_server
SNMP Version	v1, v2c, or v3 (if supported) for your management configuration

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Note - Although ILOM 2.0 continues to support the `SUN-ILOM-PET-EVENTS MIB`, you are recommended to configure your service processors to use the more robust `SUN-HW-TRAP-MIB MIB`.

---

7. To apply the settings, click **Submit**.

Your Sun ILOM service processor is now configured to send SUN-HW-TRAP-MIB SNMP traps to all trap destinations.

Configuring Sun Embedded LOM Version 2.91 Service Processors

Embedded LOM must be configured to send PET traps to the correct destination. In this case the destination is the server where the MTTrapd is running.

▶ To configure SNMP protocol settings on an Embedded LOM service processor:

1. Launch the Embedded LOM service processor web GUI (Server Management) on the service processor to be configured and managed.
2. Log in to the Server Management application as root.

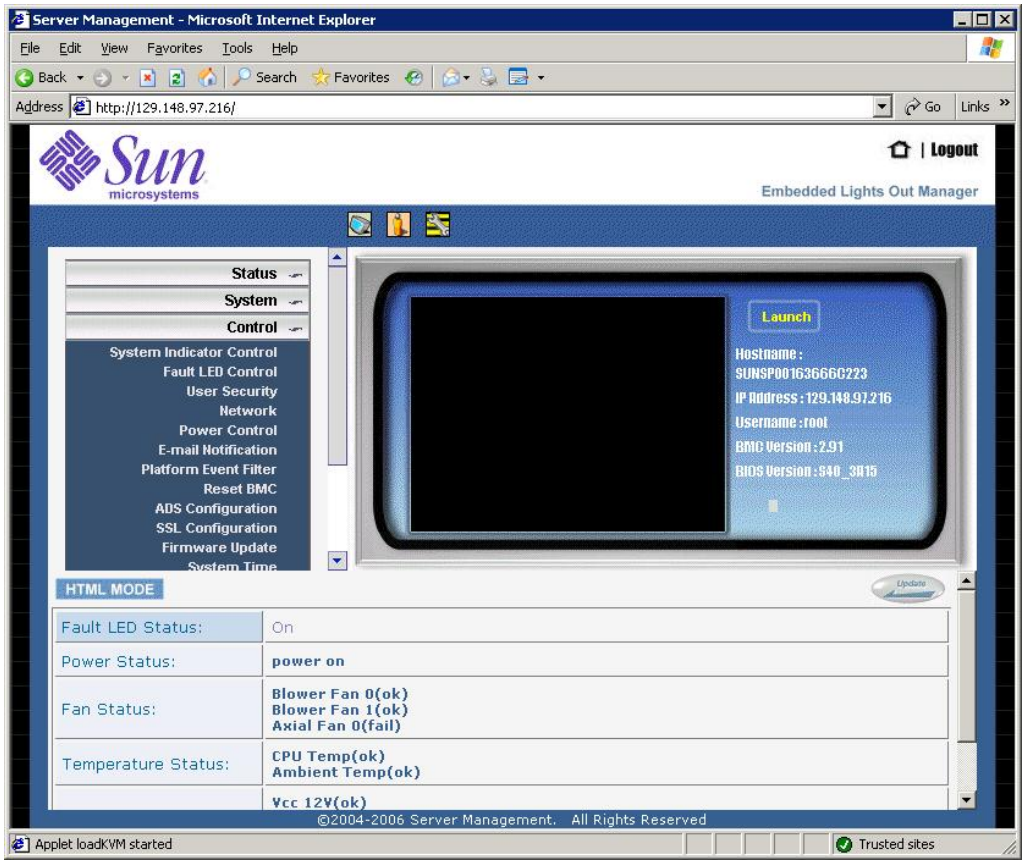

Figure 6: Embedded LOM Server Management

3. Click **Control > Platform Event Filter**.

   The **Platform Event Filter** opens.

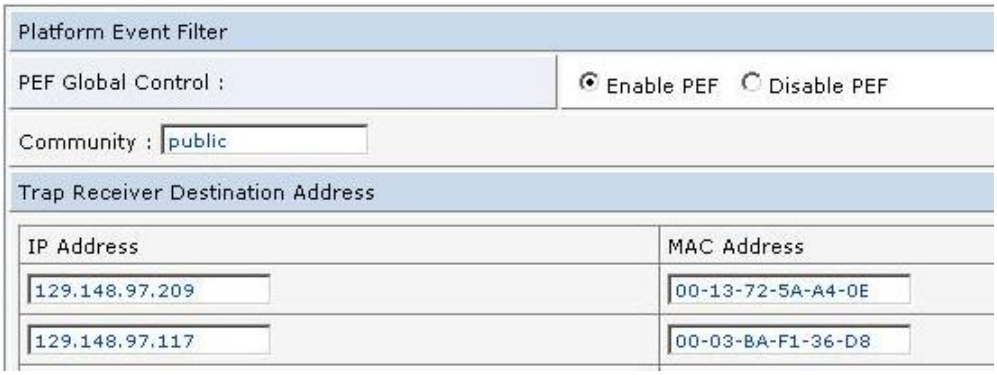

Figure 7: Platform Event Filter

4. Verify or set the following settings:

Parameter	Value
PEF Global Control	Enable PEF is checked
IP Address	IP address of the Netcool/OMNIbus management server
MAC Address	MAC address of the Netcool/OMNIbus management server

5. Scroll down to the next section of the form and set the options appropriate for your environment.

Note - Enable Send Alert Action must be checked.

---

6. To apply the settings, click **Submit**.
7. Click **SNMP > SNMP Settings** in the menu pane.
8. Verify or set the following parameters:

Parameter	Value
Port	161 (the default)
v1 Protocol	Checked
v2 Protocol	Checked only if the v2 protocol is needed
v3 Protocol	Checked only if the v3 protocol is supported and needed

9. To apply the settings, click **Submit**.

Your Embedded LOM service processor is now configured to send IPMI PETs to all trap destinations listed.

Configuring Sun Embedded LOM Version 4.x Service Processors

Embedded LOM must be configured to send PET traps to the correct destination. In this case the destination is the server where the MTTrapd is running.

▶ To configure SNMP protocol settings on an Embedded LOM Version 4.x service processor:

1. Launch the Embedded LOM service processor web GUI (Server Management) on the service processor to be configured and managed.
2. Log in to the Server Management application as root.
3. Click **Configuration > Platform Event Filter** in the tabbed interface.

   The **Platform Event Filter** opens.

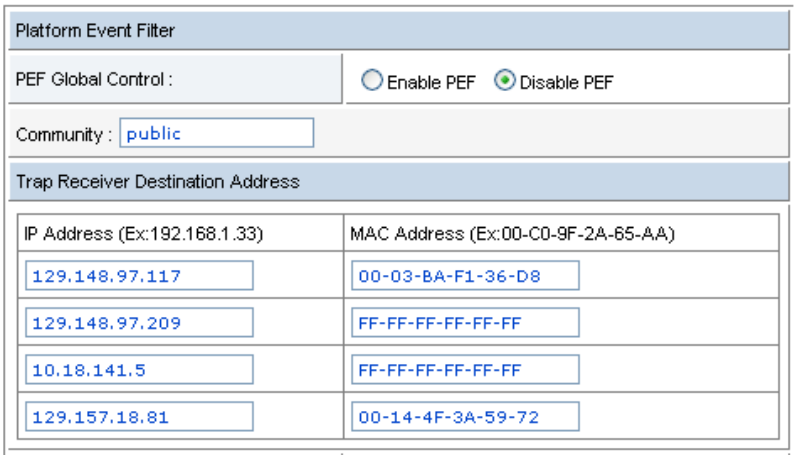

Figure 8: Platform Event Filter

4. Verify or set the following parameters:

Parameter	Value
PEF Global Control	Enable PEF must be on.
IP Address	IP_address of the server hosting the MTTrapd Probe
MAC Address	Mac_address of the server hosting the MTTrapd Probe

5. Scroll down to the next section of the form and set the options appropriate for your environment.

Note -Enable Send Alert Action must be checked.

6. Click **Submit** to apply the settings.
7. Click **Configuration > SNMP > SNMP Settings**.
8. Verify or enter the following settings:

Parameter	Value
Port	161 (the default)
v1 Protocol	Checked
v2c Protocol	Checked only if the v2c protocol is needed
v3 Protocol	Checked only if the v3 protocol is supported for your management configuration

9. To apply the settings, click **Submit**.

Your Embedded LOM Version 4.x service processor is now configured to send IPMI PETs to all trap destinations listed.

Verifying Successful Configuration for Netcool/OMNIbus

To the extent that the Oracle HMC for Netcool/OMNIbus employs a variety of system management technologies to monitor different types of Sun servers, there is no one procedure that exercises every interface on each managed system in order to verify that the entire integration has been installed and configured properly.

If you are physically located with your managed systems, you could always manually remove and re-insert a non-critical component on one Sun server after another. For more information, see Verifying Configuration Manually. This manual procedure becomes impractical at large installations and impossible at remote locations. Performing remote verification is more convenient, but requires different procedures for OS-level or SP-level integrations and for different types of Sun servers (x86 or SPARC).

To determine which remote procedures are appropriate for your test plan and for the types of Sun servers supported by your management application, consult the following table.

CPU Type	SP Type	OS-level Procedure(s)	SP-level Procedure(s)
x86	ILOM	Not supported	See Verifying Configuration Remotely Using IPMItool.
x86	Embedded LOM	Not supported	See Verifying Configuration Remotely Using IPMItool.
SPARC	ILOM	See Verifying Configuration Remotely Using psradm.	See Verifying Configuration Remotely Using IPMItool.
SPARC	ALOM	See Verifying Configuration Remotely Using ALOM.	Not supported

The following sections describe how to perform each of these procedures.

Verifying Configuration Manually

If you are located physically near one or more of your Sun servers, you can always verify configuration by generating a physical event. The most reliable way to accomplish this is to remove and re-insert a non-critical component.

▶ To test your configuration manually:

1. Locate the Sun server or Blade module in your data center.
2. Identify a component on that system that is non-critical and hot-pluggable (for example, a redundant power supply or fan tray).

Note - be certain that removal and re-insertion of this component will not affect the normal and routine operation of the server. Verify that the redundant component is, in fact, not critical to the current state of the system.

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3. Remove the non-critical component.

Note - be certain to follow all required software and firmware procedures required for the safe removal of any hot-pluggable component. Consult the Sun manual or online information system that ships with your Sun server for specific procedures related to removing that hot-pluggable component.

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4. After an appropriate amount of time, re-insert the non-critical component.
5. In the message or event console of your management package, verify that removing/re-inserting the non-critical component has generated one or more traps with the appropriate event summary and severity.

If you do not see these traps in the console, review this manual for required configuration steps or consult the Troubleshooting section of this manual.

Verifying Configuration Remotely Using ALOM

It is possible to verify the configuration remotely.

▶ To verify that a remote ALOM-based SPARC Solaris system is configured correctly:

1. Identify the name and/or IP address of the ALOM-based SPARC Solaris server that you want to test.
2. Log in to the ALOM CMT command shell on that remote system via an Ethernet or serial connection.
3. Enter the following command to determine the current state of the system locator LED.

   ```
   sc> showlocator
   ```

   ALOM returns one of the following messages:

   ```
   Locator led is ON

   Locator led is OFF
   ```

Note - the following example assumes that the locator LED is currently OFF.

---

4. Enter the following command to turn the locator LED on.

   ```
   sc> setlocator on
   ```

5. In the message or event console of your management package, verify that it has received an event from ALOM indicating that the locator LED is on.
6. Enter the following command to restore the locator LED to off.

   ```
   sc> setlocator off
   ```

7. Optionally, in the message or event console of your management package, verify that it has received an event from ALOM indicating that the locator LED is off.

Verifying Configuration Remotely Using IPMItool

Recent Sun servers support either an Integrated Lights Out Manager (ILOM) service processor (Sun Fire x86 servers, Sun SPARC Enterprise T5x20 servers) or an Embedded LOM service processor (Sun Fire x86 servers). You can communicate with these ILOM and Embedded LOM service processors via their IPMI interfaces to have them generate non-critical, simulated events. If Netcool/OMNIbus receives these non-critical, simulated events from ILOM or from Embedded LOM, it is configured properly for actual events.

IPMItool is an open-source utility for managing and configuring devices that support the Intelligent Platform Management Interface (IPMI) version 1.5 and

version 2.0 specifications. Versions of IPMItool are available for the Solaris, Linux, and Windows operating systems.

Operating System	IPMItool Distribution(s)
Solaris	http://ipmitool.sourceforge.net Many software resource CDs distributed with Sun servers.
Linux	http://ipmitool.sourceforge.net Many software resource CDs distributed with Sun servers.
Windows	http://www.sun.com/system-management/tools.jsp Many software resource CDs distributed with Sun servers.

▶ To verify that Netcool/OMNIbus is configured to receive traps from a Sun Fire x86 or a Sun SPARC Enterprise T5x20 server:

1. Collect the following information about the remote service processor that you want to test:

Parameter	Value
`<SPname>`	The name or IP address of the service processor
`<SPadminname>`	The administrator login name for the service processor
`<SPadminpassword>`	The administrator password for the service processor

2. Open a command shell on the system that has IPMItool installed.
3. Enter the following IPMItool command to generate a list of all available sensors on that remote Sun server.

```
ipmitool -U <SPadminname> -P <SPadminpassword> \
-H <SPname> -v sdr list
```

4. For example, to get the list of available sensors on a Sun SPARC Enterprise T5120 server at IP address 192.168.1.1 and the ILOM SP login is root and password is changeme, use the following command:

```
ipmitool -U root -P changeme -H 192.168.1.1 -v sdr
list
```

5. In the output from IPMItool, identify the Sensor ID name of a sensor that has at least one entry in the Assertions Enabled or Deassertions Enabled fields.
6. In the following example, IPMItool returns the following information about the sensor named `/MB/T_AMB`.

```
Sensor ID              : /MB/T_AMB (0x9)
Entity ID              : 7.0 (System Board)
Sensor Type (Analog)   : Temperature
```

```
Upper critical        : 55.000
Assertions Enabled    : lnc- lcr- lnr- unc+ ucr+ unr+
Deassertions Enabled  : lnc- lcr- lnr- unc+ ucr+ unr+
```

This sensor monitors ambient temperature on the motherboard of servers.

Note - exercise caution in choosing a sensor to use for a simulated event. Simulating extreme high or low temperature for some sensors may cause the server to shut down.

---

7. Enter the following IPMI command to generate a simulated event:

   ```
   ipmitool -U <SPadminname> -P <SPadminpassword> \
   -H <SPname> event <sensorname> <option>
   ```

   For example, to generate a simulated event for exceeding the upper critical (ucr) ambient temperature on a Sun SPARC Enterprise T5120 server at IP address 192.168.1.1 and the ILOM SP login is root and password is changeme, you would enter the following command:

   ```
   ipmitool -U root -P changeme -H 192.168.1.1 \
   event /MB/T_AMB ucr assert
   ```

   In the command shell, IPMItool returns information like the following:

   ```
   Finding sensor /MB/T_AMB … ok
   0 | Pre-Init Time-stamp | Temperature /MB/T_AMB | \
   Upper Critical going high | Reading 56 > Threshold \
   55 degrees C
   ```

8. In the message or event console of your management package, verify that it has received an event from ILOM or from Embedded LOM relevant to the sensor that you specified in your IPMItool command.

   If you do not see these messages in the console, review this manual for required configuration steps or consult the Troubleshooting section of this manual.

9. **(Recommended)**

   Clear the simulated event with the following syntax:

   ```
   ipmitool -U <SPadminname> -P <SPadminpassword> \
   -H <SPname> event <sensorname> <option>
   ```

   To clear (deassert) the simulated event in the previous example, enter the following command:

   ```
   ipmitool -U root -P changeme -H 192.168.1.1 \
   event /MB/T_AMB ucr deassert
   ```

If you do not see these messages in the console, review this manual for required configuration steps or consult the Troubleshooting section of this manual.

Verifying Configuration Remotely Using psradm

The Solaris utility `psradm`(1M) performs configuration on multiprocessor CPUs. When you use `psradm` to disable or to re-enable a CPU core, it generates a trap that should appear in the Netcool/OMNIbus event console. This procedure is appropriate if you are verifying configuration for a Sun SPARC Enterprise server supporting the ILOM service processor such as the SPARC Enterprise T5120 or T5220 server.

▶ To use `psradm` to generate a trap for one of these supported systems:

1. Identify the name and/or IP address of the server that you want to test.
2. Log in to that server as root or with administrator privileges.
3. Enter the following command to disable a specific CPU core on that remote server:

   ```
   psradm -f <CPU_Core_ID>
   ```

   where <*CPU_Core_ID*> is the ID for one CPUcore.

   For example, to disable core 0 on a Sun SPARC Enterprise T5120, you would enter the following command:

   ```
   psradm -f 0
   ```

4. The trap generated by the T5120 should appear in the Netcool/OMNIbus event console in a format like the following:

   ```
   CH/MB/CMP0/P0/CPU Device has been removed
   ```

5. (Recommended) Enter the following command to re-enable that same CPU core on that remote server:

   ```
   psradm -n <CPU_Core_ID>
   ```

If you do not see these messages in the console, review this manual for required configuration steps or consult the Troubleshooting section of this manual

CHAPTER 5

Monitoring Sun Devices in Netcool/OMNIbus

This section provides an overview of the information available in Netcool/OMNIbus after installing Oracle HMC for Netcool/OMNIbus. This section contains the following:

- Interpreting Messages in Netcool/OMNIbus

Interpreting Messages in Netcool/OMNIbus

Once you have configured Oracle HMC for Netcool/OMNIbus and configured your Sun servers and service processors to forward SNMP traps, you can monitor messages in one or more of the Netcool/OMNIbus clients.

The Oracle HMC for Netcool/OMNIbus relies on the MTTrapd Probe to collect all the SNMP traps sent to it by Sun servers and service processors, to process those traps, and to make them available to the client applications such as the Netcool Conductor for browsing. The MTTrapd Probe receives Sun SNMP traps from the different Sun SNMP agents or MIBs depending on the different types of Sun servers being modified, as shown in Figure 9.

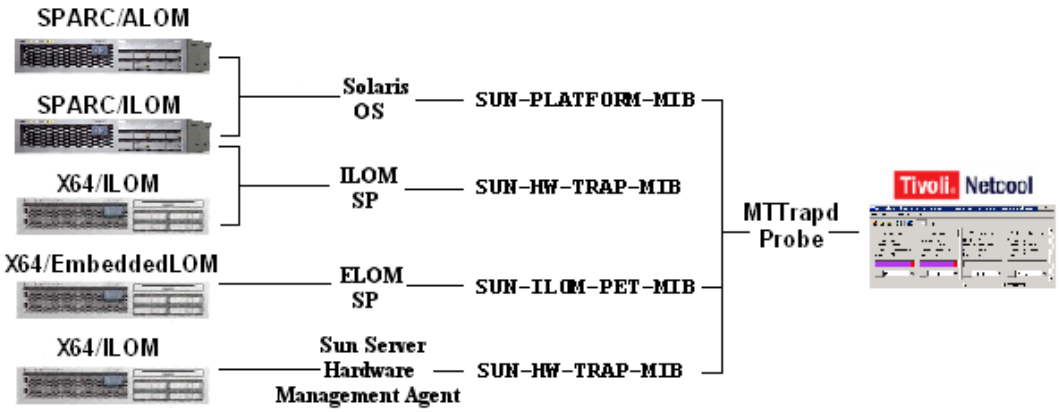

Figure 9: Monitoring Options

SPARC/ALOM and SPARC/ILOM servers send the MTTrapd Probe traps via the Solaris operating system. SPARC/ILOM, x86/ILOM, and x86/Embedded LOM servers send SNMP traps via their service processors.

You can create custom filters in the Netcool Conductor to display traps from each of these sources.

When reviewing details about each filter group in the Sub-Event List, you can determine the type of Sun server sending traps to MTTrapd Probe by examining the prefix to the AlertGroup field in the Conductor. The prefixes used by the different types of Sun servers sending traps are explained in the following table.

Sun Server Type	AlertGroup Prefix
SPARC/ALOM	sunPlat
SPARC/ILOM	SunHWTrap
x86/ILOM	SunHWTrap
x86/Embedded LOM	petTrap

Figure 10 illustrates messages received from these server types:

- x86/ILOM (wgs97-210)
- SPARC/ALOM (wgs40-01)
- x86/Embedded LOM (wgs97-210)

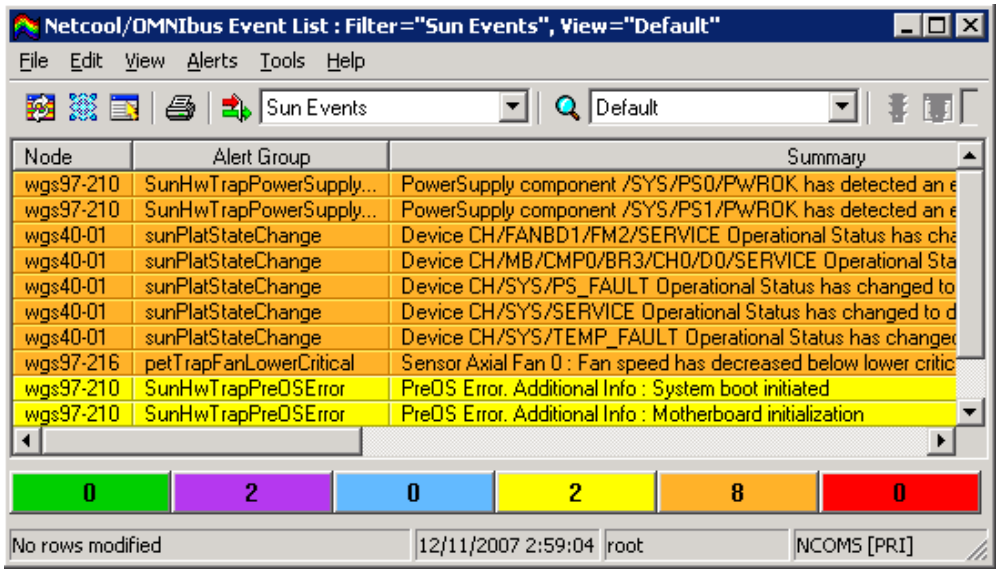

Figure 10: Multiple Sun Server Traps

From the Sub-Event List, you can double-click an event to view additional information about the individual sensor that generated it.

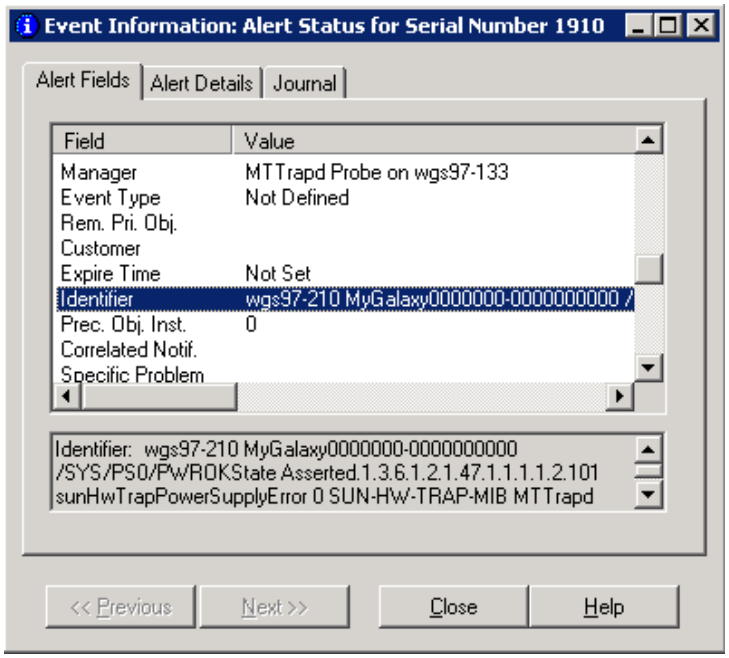

Figure 11: Event Additional Information

Referring to Figure 11, you can see details about the first item in the list, an alert concerning a power supply failure on an x86/ILOM system (wgs97-210).

APPENDIX A

Sun SNMP MIBs

Many Sun system management integration packages depend on the SNMP protocol and use one or more of the following Sun SNMP MIBs:

- ENTITY-MIB: This MIB is used by all SNMP agents to monitor and to describe the physical and logical elements of a managed system. The operation of this MIB is described in the Sun publication Sun SNMP Management Agent Administration Guide for Sun Blade, Sun Fire and Netra Servers (819-7978).

  Filename: `ENTITY-MIB.mib`

  Note: The ENTITY-MIB is not used with integrations based exclusively on SNMP traps.

- SUN-PLATFORM-MIB: This MIB is used by Oracle Solaris-based servers to extend the ENTITY-MIB Physical Entity Table to represent new classes of component and the Logical Entity Table to represent high value platform and server objects. This MIB supplies the Sun SNMP Management Agent for Sun Fire and Netra Systems with traps. The operation of this MIB is described in the Sun publication Sun SNMP Management Agent Administration Guide for Sun Blade, Sun Fire and Netra Servers (819-7978).

  Filename: `SUN-PLATFORM-MIB.mib`

- SUN-ILOM-PET-MIB: This MIB enables management platforms that are not IPMI compliant to partly decode standard IPMI Platform Event Traps (PETS) generated by the ILOM v1.x and Embedded LOM service processors.

  Filename: `SUN-ILOM-PET-MIB.mib`

- SUN-HW-TRAP-MIB: This MIB replaces and enhances the SUN-ILOM-PET MIB for ILOM 2.x systems.

  Filename: `SUN-HW-TRAP-MIB.mib`

- SUN-HW-MONITORING-MIB: This MIB enables hardware inventory, status, version and power consumption information related to the Sun server or blade implementing this MIB. SNMP Traps associated with this server are defined in a separate SUN-HW-TRAP-MIB.

  Filename: `SUN-HW-MONITORING-MIB.mib`

To view a summary of the entries in these MIBs or to download them, consult the following Sun web site:

http://www.sun.com/system-management/tools.jsp

The Sun Automatic Service Request (ASR) software provides auto case generation when specific hardware faults occur. The following MIB is used:

- SUN-ASR-NOTIFICATION-MIB: Integrates the ASR service-request features such as sending case creation and test alert messages.

For more information on the SUN-ASR-NOTIFICATION-MIB and Sun Automatic Service Request, see:

http://www.sun.com/service/asr/

APPENDIX B

Release Notes

This section contains late breaking information relating to Oracle HMC for Netcool/OMNIbus.

- When you are using IPMItool to inject an event on a HDD sensor (for example DBP/HDD5/STATE), a SUN-HW-TRAP-MIB trap is sent, but for the wrong sensor (for example /SYS/DBP/HDD5/STATE-HIDDEN). (CR6875112)
- Sun Blade T6320 and Sun Blade T6340 Server Modules do not send traps in response to faults from the service processor or systems being monitored using the Sun SNMP Management Agent. (CR6979493)