

Oracle® Server Management Agents 2.1 User's Guide



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Contents

Preface	5
Documentation and Feedback	5
About This Documentation (PDF and HTML)	5
Change History	6
Oracle Server Management Agents 2.1 User's Guide Overview	7
Oracle Hardware Management Agents	9
Installing Components Using the Oracle Hardware Management Pack Installer	13
Getting Started	13
Prerequisites	13
Installation Issues	14
Getting the Software	15
Installing Hardware Management Pack Components Using Installer	15
Configuring Hardware Management Agent and Hardware SNMP Plugins	43
Hardware Management Agent Configuration File	43
Configuring the Hardware Management Agent Logging Level	44
How to Configure the Hardware Management Agent Logging Level	45
(Solaris and Linux) Hardware Management Agent Runtime Options	45
Configuring your Host Operating System's SNMP	46
(Solaris and Linux) Configuring Net-SNMP/SMA	46
(Windows) Configuring SNMP	48
Oracle Hardware SNMP Plugins	51
Overview of Oracle HW Monitoring MIB	51
Overview of Oracle HW Trap MIB	55
Overview of Oracle Storage MIB	55
Working With Management Agents	59
Retrieving and Setting Information Through SNMP	59
sunHwMonProductGroup	59
sunHwMonProductChassisGroup	61

sunHwMonSPGroup	61
sunHwMonInventoryTable	62
sunHwMonSensorGroup	63
sunHwMonIndicatorLocator	65
Generating SNMP Traps	66
Troubleshooting Management Agents	69
General Management Agents Troubleshooting	69
Solaris Operating System Troubleshooting	69
Linux Troubleshooting	71
Index	75

Preface

The Oracle Hardware Management Pack documentation provides detailed information about how to install and use Hardware Management Pack and its components.

This preface describes related documentation, submitting feedback to Oracle, and a document change history.

- “Documentation and Feedback” on page 5
- “About This Documentation (PDF and HTML)” on page 5
- “Change History” on page 6

Documentation and Feedback

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
Oracle Hardware Management Pack	http://download.oracle.com/docs/cd/E19960-01/index.html
Oracle ILOM 3.0	http://www.oracle.com/technetwork/documentation/sys-mgmt-networking-190072.html#ilom

Provide feedback on this documentation at:

<http://www.oracle-surveys.com/se.ashx?s=25113745587BE578>.

About This Documentation (PDF and HTML)

This documentation set is available in both PDF and HTML. The information is presented in topic-based format (similar to online help) and therefore does not include chapters, appendices or section numbering.

Change History

The following changes have been made to the documentation set.

- September 2010, initial publication
- January 2011, Installation Guide and Management Agent User's Guide updated
- July 2011, updated document URLs

Oracle Server Management Agents 2.1 User's Guide Overview

This guide provides an overview of Oracle Hardware Management Agents (Management Agents) and how to use them with your Oracle server. The following topics are covered in this guide:

- “Oracle Hardware Management Agents” on page 9
- “Installing Components Using the Oracle Hardware Management Pack Installer” on page 13
- “Configuring Hardware Management Agent and Hardware SNMP Plugins” on page 43
- “Oracle Hardware SNMP Plugins” on page 51
- “Working With Management Agents” on page 59
- “Troubleshooting Management Agents” on page 69

Oracle Hardware Management Agents

Oracle Hardware Management Agents provide operating-system-specific agents to enable management of your Oracle server.

The Oracle Hardware Management Agents component provides the following software:

- Oracle Hardware Management Agent
- Oracle Hardware SNMP Plugins
- Oracle Hardware Storage Management Agent
- Oracle Hardware Storage Access Libraries

Oracle Hardware Management Agent

The Oracle Hardware Management Agent (Hardware Management Agent) and associated Oracle Hardware SNMP Plugins and Oracle Hardware Storage SNMP Plugins (SNMP Plugins) provide a way to monitor your server and server module's hardware. With the Hardware Management Agent SNMP Plugins you can use SNMP to monitor the Oracle servers and server modules in your data center, without having to connect the management port of the ILOM service processor to the network. This in-band functionality enables you to use a single IP address (the host's IP) for monitoring you servers and server modules.

The Hardware Management Agent SNMP Plugins run on the host operating system of Oracle servers. The Oracle Hardware SNMP Plugin uses the keyboard controller-style (KCS) interface to communicate with the service processor, and the Oracle Hardware Storage SNMP Plugins use the Oracle Hardware Storage Access Libraries to communicate with the service processor. By regularly polling the service processor, information about the current state of the server is fetched automatically by the Hardware Management Agent. This information is then made available through SNMP, using the SNMP Plugins.

The Hardware Management Agent polls the service processor for hardware information over the KCS interface or Oracle Hardware Storage Access Libraries. The Hardware Management Agent is visible on the network through the SNMP Plugins. The SUN-HW-MONITORING-MIB Net-SNMP plugin communicates over a socket to the Hardware Management Agent daemon service, called hwmgmt. The Hardware Management Agent also communicates over a socket to the SUN-HW-TRAP-MIB Net-SNMP plugin, sending SNMP traps via the Net-SNMP agent. In addition, the Hardware Management Agent provides sensor and indicator readings, as well as System Event Log records.

The System Event Log (SEL) is stored on the service processor and is used for recording hardware events such as temperatures crossing a threshold. The Hardware Management Agent reads the service processor's SEL records and writes this information to the host operating system's syslog and sends the SUN-HW-TRAP-MIB traps. For storage information, the Hardware Management Agent uses the Oracle Hardware Storage Access Library. Finally, the Hardware Management Agent also maintains a separate log that contains information about the Hardware Management Agent status, which can be used for troubleshooting.

Previous versions of Hardware Management Pack have included a separate Storage Management Agent, but starting with Oracle Hardware Management Pack 2.1, the Storage Management Agent has been merged with the functionality of the Hardware Management Agent.

System storage information is now available via SNMP with the sunStorageMIB.

Oracle Hardware SNMP Plugins

The Oracle Hardware SNMP Plugins consist of two Net-SNMP plugins. These Net-SNMP plugins are compiled versions of three Oracle-specific hardware Management Information Bases (MIB) that have been designed to enable you to monitor your Oracle servers effectively. The Sun HW Monitoring MIB is a newly developed MIB that provides the following information:

- Overall system alarm status
- Aggregate alarm status by device type
- FRU Alarm status
- Lists of sensors, sensor types, sensor readings, and sensor thresholds
- Indicator states
- System locator control
- Inventory including basic manufacturing information
- Product and chassis inventory information (such as serial number and part numbers)
- Per-sensor alarm status

The HW Trap MIB describes a set of traps for hardware events that can be generated by an Oracle server and provides the following information:

- Conditions affecting the environmental state of the server (such as temperature, voltage, and current out-of-range conditions)
- Error conditions affecting the hardware components in the server such as FRU insertion and removal and security intrusion notification

The Storage MIB provides the following information about system storage:

- Basic manufacturing information, properties, and alarm status for controllers
- Properties and alarm status for disks
- Properties and alarm status for RAID volumes
- Status of logical components

Installing Components Using the Oracle Hardware Management Pack Installer

This section describes how to install and uninstall Hardware Management Pack components on an Oracle server using the supplied Oracle Hardware Management Pack Installer. This section contains the following:

- “Getting Started” on page 13
- “Prerequisites” on page 13
- “Getting the Software” on page 15
- “Installing Hardware Management Pack Components Using Installer” on page 15

Getting Started

The following methods are available for installing the Hardware Management Pack components:

- GUI mode
- Console mode
- Silent mode

Regardless of the installation method you choose, you must carry out the installation as a user with administrative privileges, such as root on Linux or Solaris and Administrator on Windows.

Prerequisites

If you have previous versions of Hardware Management Pack or Component Manager installed, you will need to remove these before installing the Oracle Hardware Management Pack 2.1 components. For more information, refer to Sun Server Hardware Management Pack 2.1 documentation at

<http://download.oracle.com/docs/cd/E19960-01/index.html>

Different components are supported by different servers and operating systems, so ensure that your target platform is supported by all of the components you intend to install. Before proceeding make sure that you have consulted the support matrix for the version that you plan to install. The support matrix is available from the HMP tab at:

<http://www.oracle.com/goto/system-management>

Depending on the target server's operating system, you should note the following:

- Oracle Solaris operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have System Management Agent (SMA). SMA is installed by default on Solaris. For more information about SMA, see `snmpd(1M)`. When installing Hardware Management Pack components, you must be in the global zone. The device `/dev/bmc` must be present on your system for the Hardware Management Agent to function correctly.
- Linux operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have Net-SNMP installed. For more information about Net-SNMP, see the `snmpd` documentation. You must also make sure that the KCS IPMI interface between the Oracle server service processor and host operating system is enabled. When using the Hardware Management Agent, you must ensure the root user has read/write access to the IPMI device in order for the Hardware Management Agent to function correctly.
- Windows operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have an IPMI device installed and the SNMP service enabled. For more information about the IPMI devices available for your version of Windows, see your Windows product documentation.

Installation Issues

Review the following notes before performing the Hardware Management Pack installation.

Note – There might be additional installation issues in the Oracle Hardware Management Pack 2.1 Release Notes. Please review the Release Notes, along with the following issues, before installing Hardware Management Pack.

Unix Installer Issue (CR 6977584)

The installer aborts when the `DISPLAY` variable is set for a Solaris or Linux operating system. To avoid this issue, unset the `DISPLAY` variable before installing Hardware Management Pack.

Error Reported When Launching Installer on a Solaris System (CR 6982393)

When launching the Oracle Hardware Management Pack Installer on a Solaris system, the following error might appear: `./install.bin: !: not found` You can ignore this error. The Installer should launch normally.

Running Installer on Solaris With SUNWCreq Cluster Fails (CR 6982718)

Before installing Oracle Hardware Management Pack on a Solaris host installed with the `SUNWCreq` (Core System Support) metacluster, you must install `SUNWxcu4` (contains `POSIX df` command) or set the following environment variable: `IATEMPDIR=$HOME`.

Sun Fire X4170 M2 Requires Tools and Driver Installation for Correct ICH10 Slot Information (CR 6992155)

For a Sun Fire X4170 M2 system running Windows 2008 R2, you need to install the drivers from the X4170 M2 Tools and Drivers CD before using the RAIDconfig tool. Failure to install the drivers could result in the slot information for the HDDs attached to the internal ICH10 controller to be reported incorrectly.

You can also use the Oracle Hardware Installation Assistant to install Windows 2008 R2 to avoid this problem.

Getting the Software

Before you start, make sure that you have downloaded the latest Hardware Management Pack compatible with the operating system on your target server. Instructions for downloading Hardware Management Pack are available the Downloads tab at:

<http://www.oracle.com/goto/system-management>

This file contains the files necessary to install Hardware Management Pack components.

The Hardware Management Pack download file name for the operating systems supported by Hardware Management Pack is as follows:

`oracle-hmp-version-OSVersionNumber`

where *version* is the version of the Hardware Management Pack, and *OSVersionNumber* is the operating system that this Hardware Management Pack is designed for.

Once you download the Hardware Management Pack, you need to uncompress it to a local directory on the server that you want to manage.

Note – On the Solaris operating system, due to the restrictions of pkgadd(1M), the path that you uncompress the Hardware Management Pack to must not contain any spaces for the installation process to proceed.

Installing Hardware Management Pack Components Using Installer

This section covers the following topics:

- “Using GUI Mode to Install and Uninstall Components” on page 16
- “Using Console Mode to Install or Uninstall Components” on page 33

- [“Using Silent Mode to Install and Uninstall Components”](#) on page 39

Using GUI Mode to Install and Uninstall Components

This section covers the following procedures:

- [“How to Install Hardware Management Components Using GUI Mode”](#) on page 16
- [“How to Uninstall Hardware Management Components Using GUI Mode”](#) on page 26

▼ How to Install Hardware Management Components Using GUI Mode

Before You Begin

- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.
- Download and extract the Hardware Management Pack Software. See [“Getting the Software”](#) on page 15.
The directory that you extract the files is referred to as *extract-directory* in this procedure.
- For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See [“Installing the Sun IPMI System Management Driver 2.1”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide*. This driver is included with other operating systems.

1 To start the installer, issue one of the following commands:

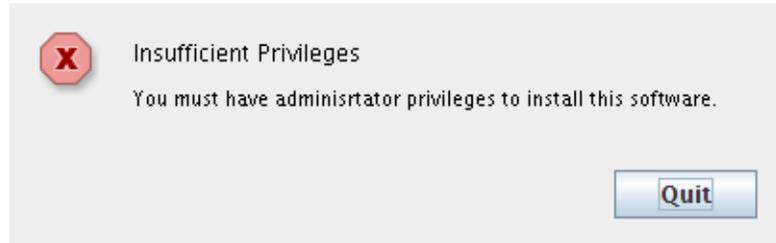
- **For Solaris or Linux systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin`
- **For Windows systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.exe`

The following splash screen appears.

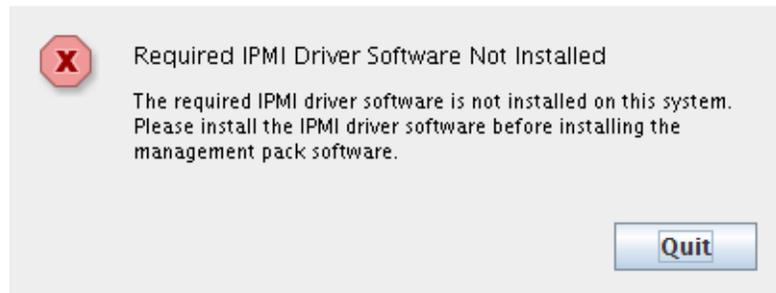


2 If any of the following dialogs display, perform the appropriate action.

- If the following dialog displays, click **Quit** and log into the system with Administrator privileges.



- If the following dialog appears, click the **Quit** button and install the IPMI driver software. See [“Installing the Sun IPMI System Management Driver 2.1”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide*.



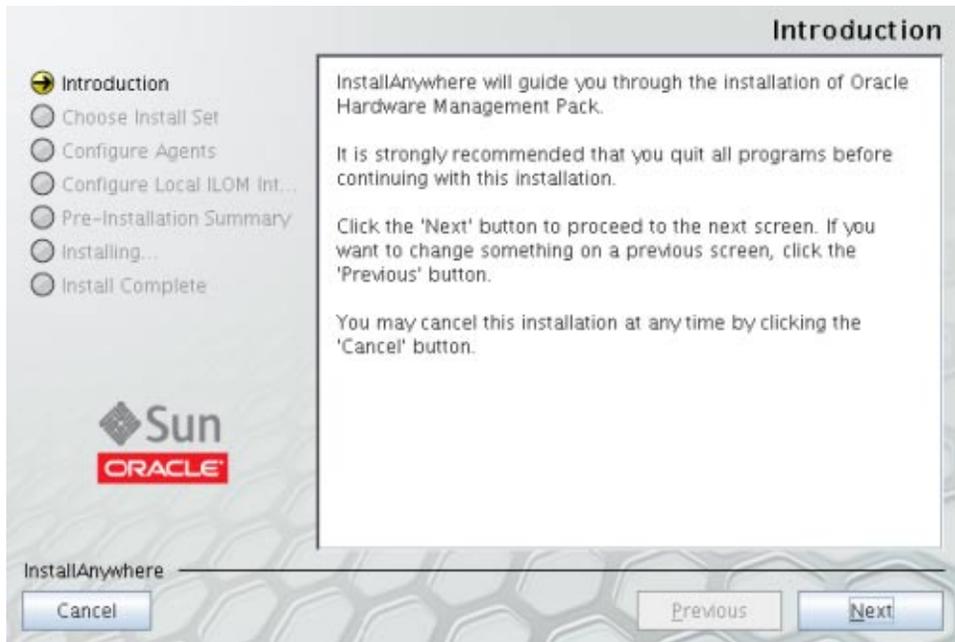
- If the following dialog displays, click **Quit** and remove the previously installed version of the software.



- If the following dialog displays, click quick and then ?



If the installation is ready to proceed, the Introduction screen appears.



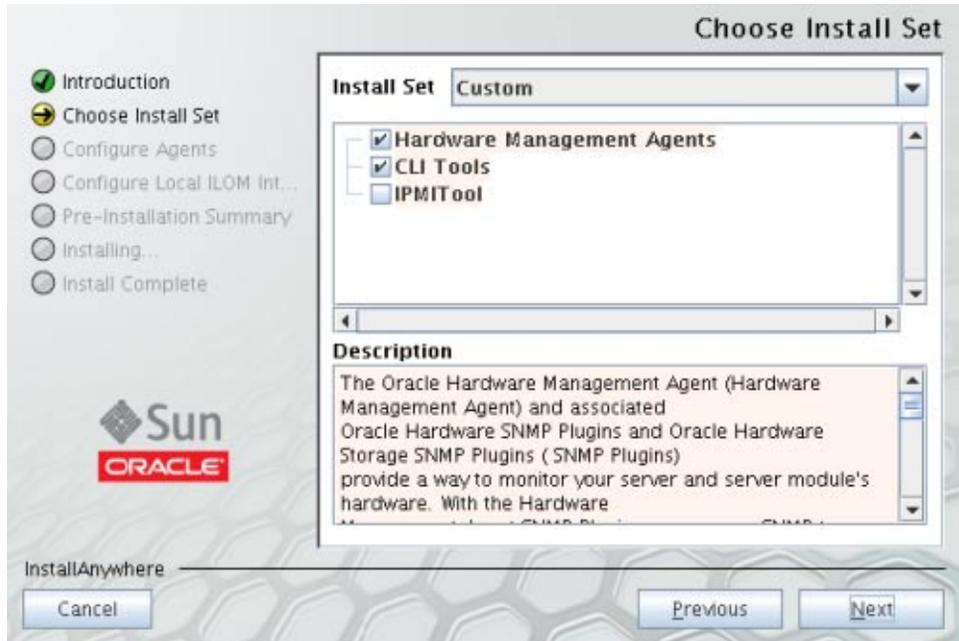
3 Click Next.

The Choose Install Set screen appears.

**4 Select either Typical or Custom and click Next.**

- If you select Standard, The Hardware Management Agents and CLI Tools options will automatically be selected.

- If you select Custom, the Choose Install Set screen appears.



- 5 Select the features that you want to install and click Next.
- 6 Take action, as needed, if one of the following dialogs appear:
 - If the following dialog appears, click OK and de-select the Hardware Management Agent feature from the Choose Install Set screen.

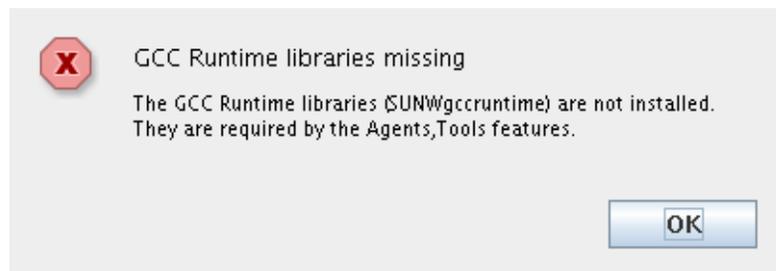


- If the following dialog appears, click OK and de-select the IPMITool feature from the Choose Install Set screen.

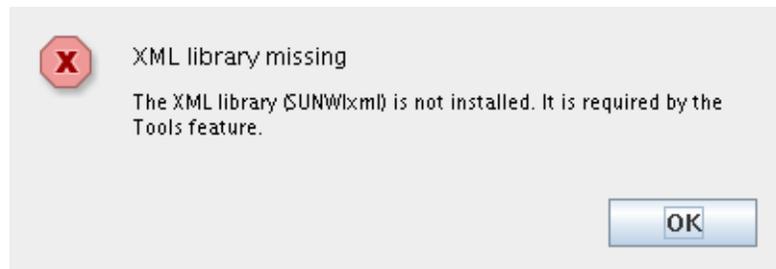


Alternatively, you can cancel the wizard and install SNMP software or remove IMPITool software, then restart the installation.

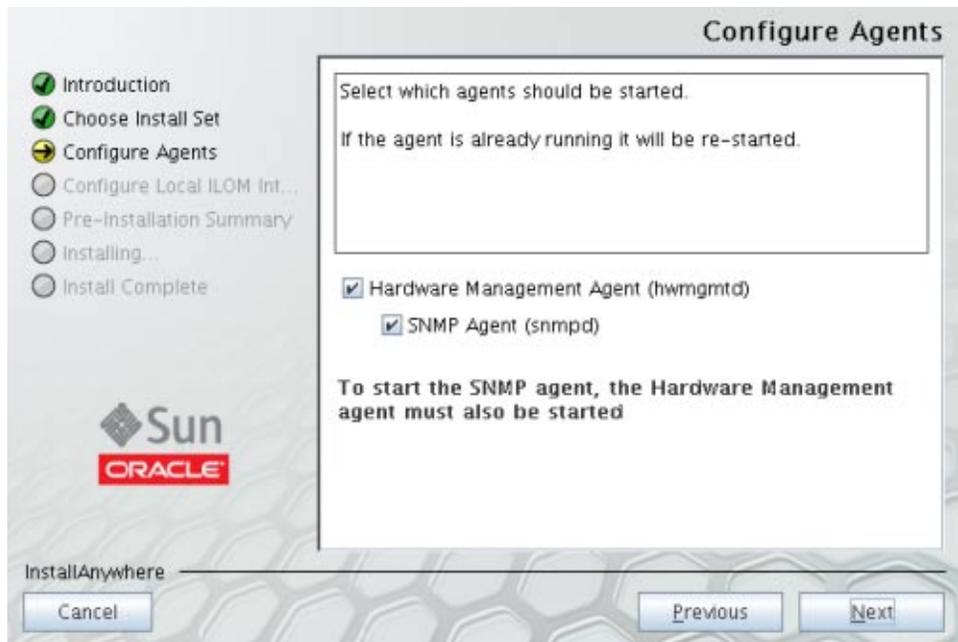
- If the following dialog appears click Quit and install the Solaris GCC runtime libraries.



- If the following dialog appears, click Quit and install the Solaris XML libraries.



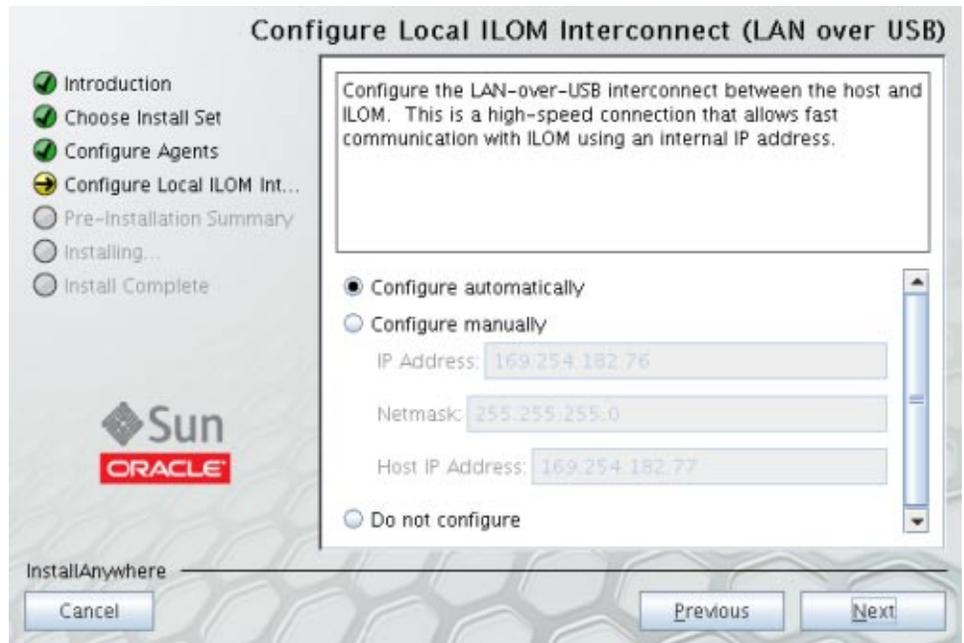
The Configure Agents screen appears.



- 7 Select Start for the Hardware Management Agent and SNMP Agent and click Next.

Note – If you select SNMP Agent, you must also select Hardware Management Agent.

The Local ILOM Interconnect (LAN Over USB) screen appears.

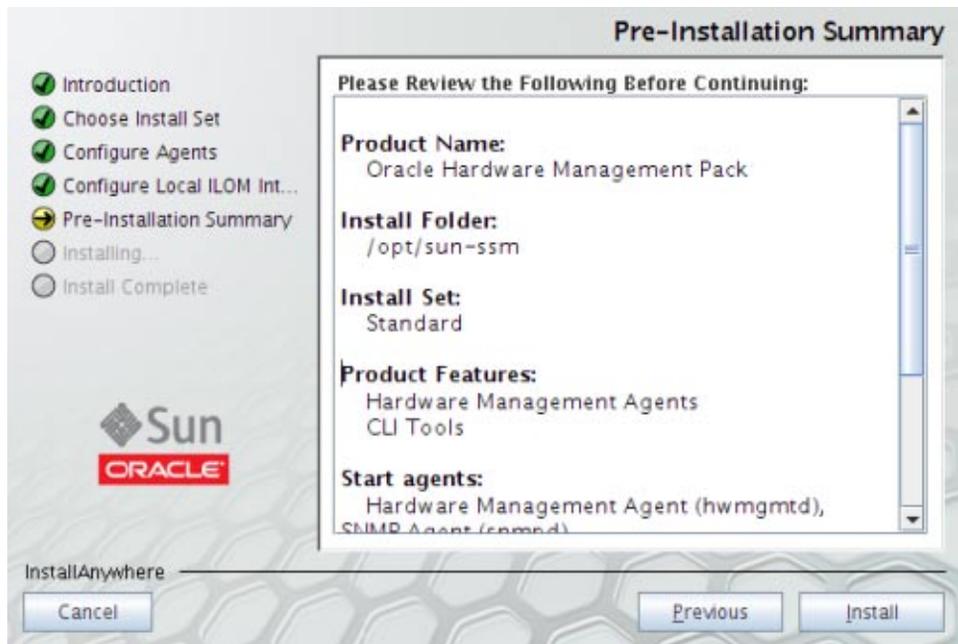


8 Select one of the options for configuring the Local ILOM Interconnect.

If you select the Configure manually option, you need to enter the ILOM IP Address, Netmask, and Host IP Address information.

Note – For more information on Local ILOM Interconnect, see “[Enabling the Local Interconnect Interface](#)” in *Oracle Hardware Management Pack 2.1 Installation Guide*.

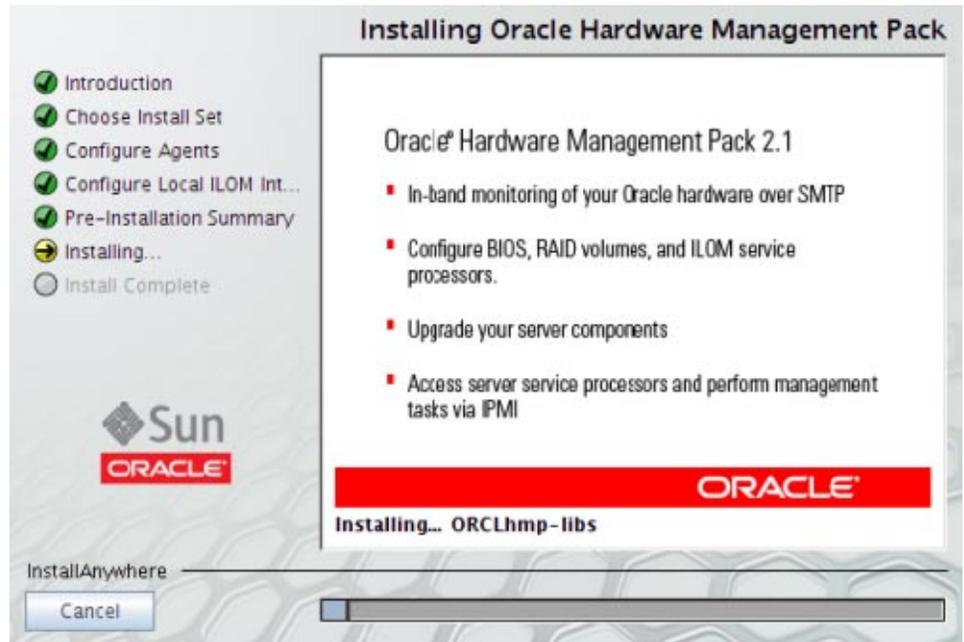
A Pre-Installation Summary screen appears with information similar to the following screen.



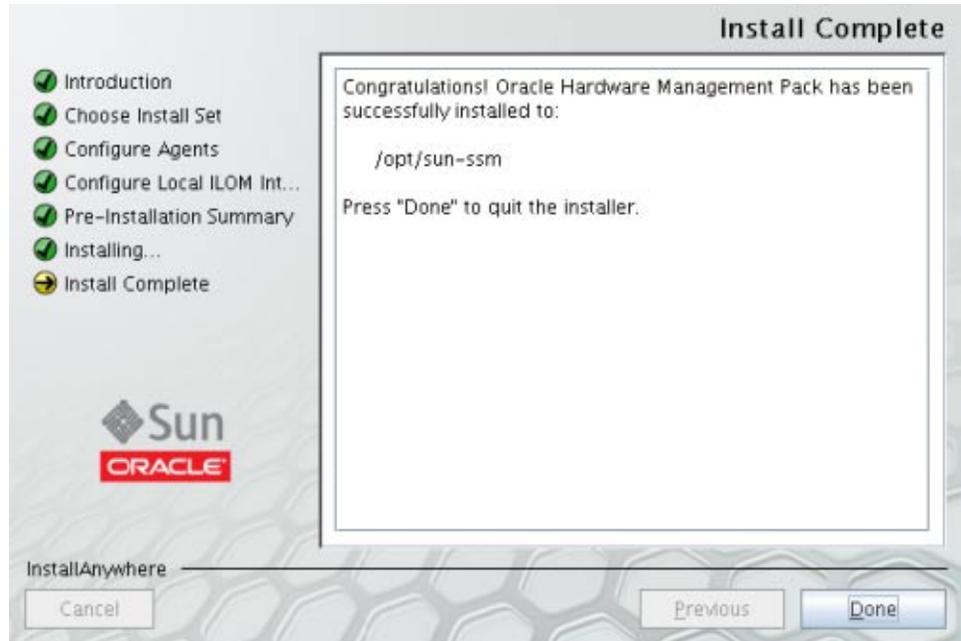
- 9 Make sure that the information in the Pre-Installation Summary is correct.
 - If you want to change any of the installation items, click the Previous button until you get back to the screen where you want to make the changes.

- If the information is correct, click Install.

The Installing Oracle Hardware Management screen appears.



The Install Complete screen appears when the installation has completed.



- 10 Click Done to complete the installation.

- See Also**
- [“How to Uninstall Hardware Management Components Using GUI Mode”](#) on page 26
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 33
 - [“Using Silent Mode to Install and Uninstall Components”](#) on page 39

▼ How to Uninstall Hardware Management Components Using GUI Mode

- Before You Begin**
- To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

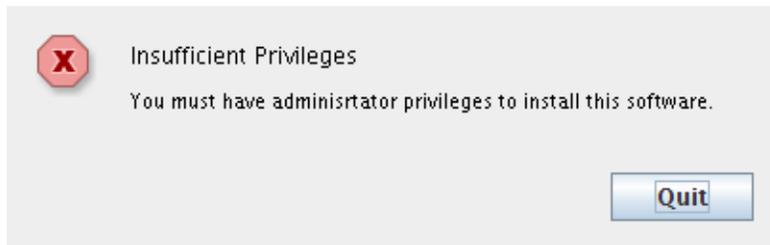
- 1 To start the uninstaller, issue one of the following commands:

- For Solaris or Linux systems: `/opt/sun-ssm/setup/uninstall`
- For Windows systems: `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall`

The following splash screen appears.



- 2 If the following dialog displays, click Quit and log into the system with Administrator privileges.



The Uninstall Oracle Management Pack screen appears.



3 Click Next.

The Uninstall Options screen appears.

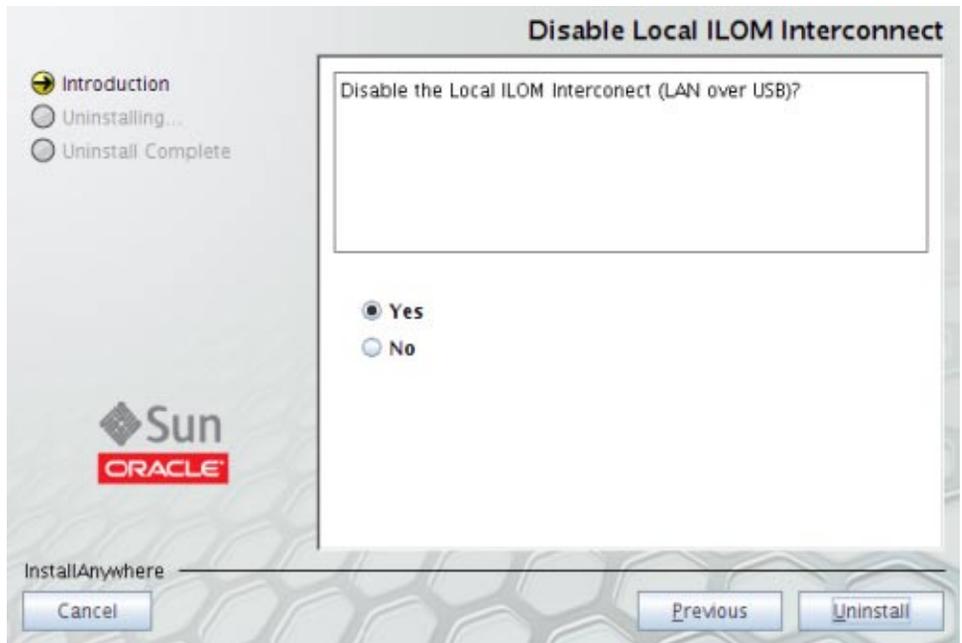


4 Select Complete Uninstall or Uninstall Specific Features and click Next.

If you selected Uninstall Specific Features, the Choose Product Features screen appears.



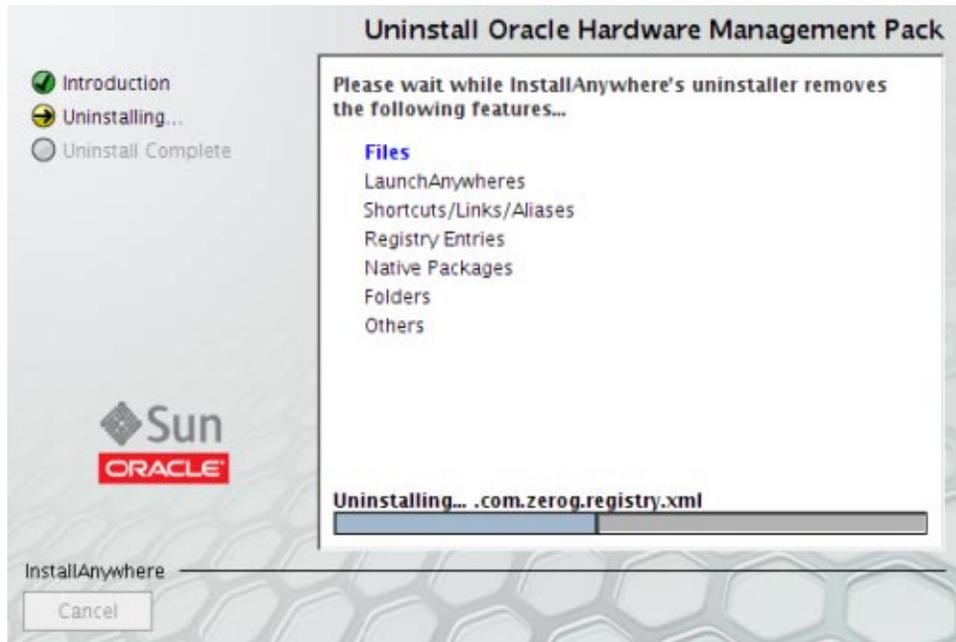
If the Local ILOM Interconnect as enabled during installation, the following screen appears.



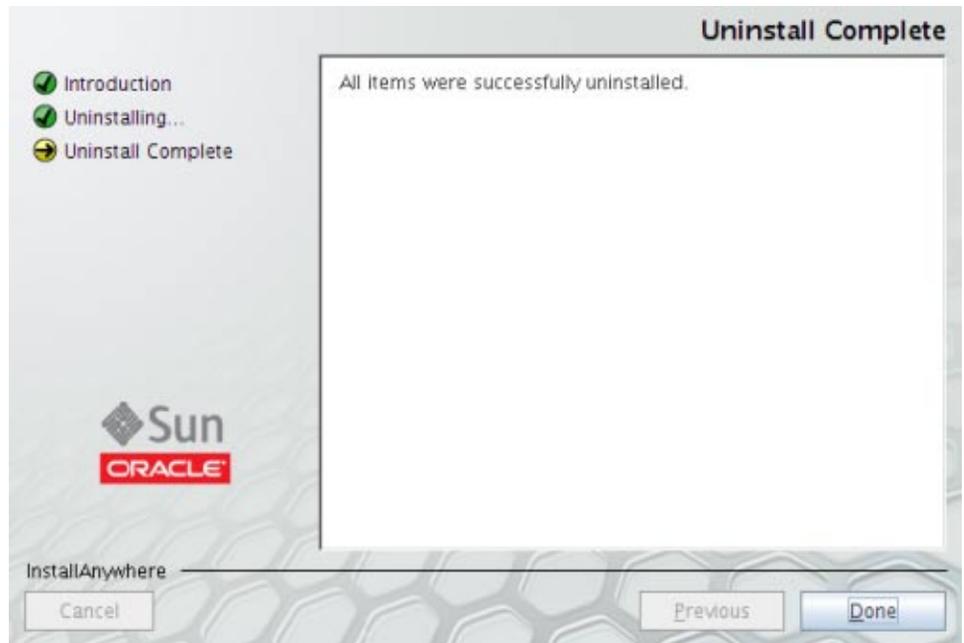
- 5 Select Yes or No and click Uninstall.

6 Select any features that you want to uninstall and click Uninstall.

The Uninstall Oracle Hardware Management Pack screen appears.



When the components have been uninstalled, the Uninstall Complete screen appears.



7 Click Done.

- See Also**
- [“How to Install Hardware Management Components Using GUI Mode”](#) on page 16
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 33
 - [“Using Silent Mode to Install and Uninstall Components”](#) on page 39

Using Console Mode to Install or Uninstall Components

This section covers the following procedures:

- [“How to Install Hardware Management Components Using Console Mode”](#) on page 33
- [“How to Uninstall Hardware Management Pack Components Using Console Mode”](#) on page 38

▼ How to Install Hardware Management Components Using Console Mode

- Before You Begin**
- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

- Download and extract the Hardware Management Pack Software. See [“Getting the Software” on page 15](#).

The directory that you extract the files is referred to as *extract-directory* in this procedure.

- For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See [“Installing the Sun IPMI System Management Driver 2.1” in *Oracle Hardware Management Pack 2.1 Installation Guide*](#).

1 Set up a console session with the server.

See product documentation for instructions on doing this.

2 To start the installer, issue one of the following commands:

- **For Solaris or Linux systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin -i console`
- **For Windows systems:** `\extract-directory\oracle-hmp-2.1\SOFTWARE\install.exe -i console`

You will see output similar to the following:

```
Preparing to install...
Extracting the installation resources from the installer archive...
Configuring the installer for this system's environment...

Launching installer...

Preparing CONSOLE Mode Installation...

=====
Oracle Hardware Management Pack                (created with InstallAnywhere)
-----

=====
Introduction
-----

InstallAnywhere will guide you through the installation of Oracle Hardware
Management Pack.

It is strongly recommended that you quit all programs before continuing with
this installation.

Respond to each prompt to proceed to the next step in the installation.  If you
want to change something on a previous step, type 'back'.

You may cancel this installation at any time by typing 'quit'.

PRESS <ENTER> TO CONTINUE:
```

3 Press Enter to Continue.

The following screen appears:

```
Choose Install Set
-----
```

Please choose the Install Set to be installed by this installer.

```
->1- Standard
    2- Customize...
```

ENTER THE NUMBER FOR THE INSTALL SET, OR PRESS <ENTER> TO ACCEPT THE DEFAULT:

4 Type the number for your choice or press Enter to select Standard.

- If you selected Standard installation, go to Step 6.

- If you selected Custom installation, the following screen appears.

ENTER A COMMA SEPARATED LIST OF NUMBERS REPRESENTING THE FEATURES YOU WOULD LIKE TO SELECT, OR DESELECT. TO VIEW A FEATURE'S DESCRIPTION, ENTER '?<NUMBER>'. PRESS <RETURN> IF YOU ARE DONE:

```
1- [X] Hardware Management Agents
2- [X] CLI Tools
3- [ ] IPMITool
```

Please choose the Features to be installed by this installer.:

Options 1 and 2 are pre-selected. When you enter a number, it will select an item that is not selected and deselect an item that is already selected.

For example, if you type 1, 3 Hardware Management Agents is deselected and IPMITool is selected.

5 Type one or more numbers separated by a comma.

If you chose to install Agents, the following screen appears. If you did not choose to install agents, go to Step 8.

```
Configure Hardware Management Agent
-----
```

Start the Hardware Management Agent? This agent's short name is hwmgmt.

```
->1- Yes
    2- No
```

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS TO ACCEPT THE DEFAULT::

6 Type the number for your choice or press Enter to select Yes.

The following screen appears:

```
Configure SNMP Agent
-----
```

Start the SNMP agent? This agent's short name is snmpd on Unix and SNMP on Windows.

- >1- Yes
- 2- No

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS `<ENTER>` TO ACCEPT THE DEFAULT::

7 Type the number for your choice or press Enter to select Yes..

The following screen appears, if you selected CLI Tools in Step 5. If you did not select CLI Tools, go to Step 10:

Configure LAN Over USB

Configure the LAN-over-USB interconnect between the host and ILOM. This is a high-speed connection that allows fast communication with ILOM using an internal IP address. This enables IPMI and SSH clients as well as a web browser running on the host operating system to connect directly to ILOM.

- >1- Configure automatically
- 2- Configure manually
- 3- Do not configure

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS `<ENTER>` TO ACCEPT THE DEFAULT:

8 Type the number for your choice or Enter to select Configure automatically.

If you choose 1 or 3, go to Step 11. If you choose 2—Configure manually, the following screen appears.

Configure LAN Over USB Manually

Specify the following parameters.

IP Address: (DEFAULT: 192.168.1.1):

Netmask: (DEFAULT: 255.255.255.0):

Host IP Address: (DEFAULT: 192.168.1.2):

9 Enter the appropriate values for the IP Address, Netmask, and Host IP Address and press Enter.

A screen similar to the following appears, to confirm your installation choices.

Pre-Installation Summary

Please Review the Following Before Continuing:

Product Name:
Oracle Hardware Management Pack

Install Folder:
/opt/sun-ssm

Install Set:
Custom

```

Product Features:
  Hardware Management Agents,
  CLI Tools

Start Agents:
  Hardware Management Agent (hwmgmt), SNMP Agent (snmpd/SNMP)

LAN Over USB:
  Configure manually

Disk Space Information (for Installation Target):
  Required: 930,151 bytes
  Available: 11,144,399,872 bytes

```

PRESS <ENTER> TO CONTINUE

10 Make sure that the information displayed is correct.

- If the information is not correct, type Back until you get back to the screen where you want to change the information.
- If the information shown in the screen is correct, press Enter to continue.

The following screen appears:

```

Ready To Install
-----

```

```

InstallAnywhere is now ready to install Oracle Hardware Management Pack onto
your system at the following location:

```

```

/opt/sun-ssm

```

PRESS <ENTER> TO INSTALL:

11 Press Enter to begin the installation.

The installation should take about 2 minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following screen appears:

```

Installation Complete
-----

```

```

Congratulations. Oracle Hardware Management Pack has been successfully
installed to:

```

```

/opt/sun-ssm

```

PRESS <ENTER> TO EXIT THE INSTALLER:

- See Also** ▪ [“How to Uninstall Hardware Management Pack Components Using Console Mode” on page 38](#)

- [“Using GUI Mode to Install and Uninstall Components” on page 16](#)
- [“Using Silent Mode to Install and Uninstall Components” on page 39](#)

▼ **How to Uninstall Hardware Management Pack Components Using Console Mode**

Before You Begin ▪ To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

1 To start the unininstallation, issue one of the following command:

- **For Solaris or Linux systems:** `/opt/sun-ssm/setup/uninstall -i console`
- **For Windows systems:** `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall -i console`

The following screen appears:

```
Uninstall Oracle Hardware Management Pack
-----
```

```
About to uninstall...
```

```
Oracle Hardware Management Pack
```

```
This will remove features installed by InstallAnywhere. It will not remove
files and folders created after the installation.
```

```
PRESS <ENTER> TO CONTINUE:
```

2 Press Enter.

The following screen appears.

```
Uninstall Options
-----
```

```
ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS <ENTER> to select the default.
```

```
->1- Completely remove all features and components.
```

```
    2- Choose specific features that were installed by InstallAnywhere.
```

```
Please choose one of the following options:
```

3 Enter the number that represents your choice or press Enter to completely remove all features and components.

The uninstall begins. When the uninstall is complete, the following screen appears.

```
Uninstall Complete
-----
```

```
All items were successfully uninstalled.
```

4 Press Enter to exit the installer.

- See Also**
- “How to Install Hardware Management Components Using Console Mode” on page 33
 - “Using GUI Mode to Install and Uninstall Components” on page 16
 - “Using Silent Mode to Install and Uninstall Components” on page 39

Using Silent Mode to Install and Uninstall Components

The following topics are included in this section:

- “Silent Mode Installation Options” on page 39
- “How to Install Hardware Management Pack Component Using Silent Mode” on page 39
- “How to Uninstall Hardware Management Pack Component Using Silent Mode” on page 41

Silent Mode Installation Options

Silent mode is a non-interactive installation method. Silent mode can be executed in one of two ways:

- A silent installation can be directed by supplying a response file. The response file contains parameters and properties that define the installation choices for the Installer.
A response file can first be created by running a GUI or console mode installation using the `-r` option as shown in the following example:

```
# ./install.bin -i GUI -r /path_to_file/response.txt
```

Once the response file is created, you can use the file to do an identical silent installation, using the following command:

```
# ./install.bin -i silent -f /path_to_file/response.txt
```
- If no response is supplied, a typical installation is performed with no post-installation configuration steps.

▼ How to Install Hardware Management Pack Component Using Silent Mode

- Before You Begin**
- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.
 - Download and extract the Hardware Management Pack Software. See “Getting the Software” on page 15.
The directory that you extract the files is referred to as *extract-directory* in this procedure.
 - For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See “Installing the Sun IPMI System Management Driver 2.1” in *Oracle Hardware Management Pack 2.1 Installation Guide*.
 - Refer to “Silent Mode Installation Options” on page 39 before performing the installation.

- **To start the silent mode installation process, use one of the following commands:**

For Solaris or Linux systems:

- **For Solaris or Linux systems:**

- **To perform a typical silent installation:**

```
/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin -i silent
```

- **To perform an installation directed by a response file:**

```
/extract-directory/oracle-hmp-2.1/SOFTWARE//install.bin -i silent  
-f/path_to_file/response.txt
```

- **For Window systems:**

- **To perform a typical silent installation:**

```
\extract-directory\oracle-hmp-2.1\SOFTWARE\install.bin -i silent
```

- **To perform an installation directed by a response file:**

```
\extract-directory\oracle-hmp-2.1\SOFTWARE\install.bin -i silent  
-f\path_to_file\response.txt
```

The following output appears:

```
Preparing to install...  
Extracting the installation resources from the installer archive...  
Configuring the installer for this system's environment...
```

```
Launching installer...
```

```
Preparing SILENT Mode Installation...
```

```
=====  
Oracle Hardware Management Pack                (created with InstallAnywhere)  
-----
```

The installation should take about two minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following output displays:

```
Installation Complete.  
$
```

- See Also**
- [“How to Uninstall Hardware Management Pack Component Using Silent Mode”](#) on page 41
 - [“Using GUI Mode to Install and Uninstall Components”](#) on page 16
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 33

▼ How to Uninstall Hardware Management Pack Component Using Silent Mode

Before You Begin ■ To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

● To start the silent mode installation process, use one of the following commands:

- For Solaris or Linux systems: `/opt/sun-ssm/setup/uninstall -i silent`
- For Windows systems: `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall -i silent`

The following output appears:

```
Preparing SILENT Mode Uninstallation...
```

```
=====
Oracle Hardware Management Pack                (created with InstallAnywhere)
-----
```

```
=====
Uninstalling...
9-----
```

The installation should take about 2 minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following output displays:

```
Uninstallation Complete.
$
```

- See Also**
- [“How to Install Hardware Management Pack Component Using Silent Mode”](#) on page 39
 - [“Using GUI Mode to Install and Uninstall Components”](#) on page 16
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 33

Configuring Hardware Management Agent and Hardware SNMP Plugins

This section provides details about configuring the Hardware Management Agent and Hardware SNMP Plugins, as well as information about using Hardware Management Agent successfully. The section contains the following:

- “Hardware Management Agent Configuration File” on page 43
- “Configuring the Hardware Management Agent Logging Level” on page 44
- “How to Configure the Hardware Management Agent Logging Level” on page 45
- “(Solaris and Linux) Hardware Management Agent Runtime Options” on page 45
- “Configuring your Host Operating System's SNMP” on page 46
- “(Solaris and Linux) Configuring Net-SNMP/SMA” on page 46
- “(Windows) Configuring SNMP” on page 48

Hardware Management Agent Configuration File

Once the Hardware Management Agent and Hardware SNMP Plugins are installed on the Oracle server you want to monitor, you can configure them. There is only one configuration file for the Hardware Management Agent, which configures the level of detail used for log messages. Depending on which host operating system the Hardware Management Agent is running on, the configuration file can be found at the path shown in the following table.

Operating System	Configuration file path
Linux	/etc/sun-ssm/hwmgmtd.conf
Solaris Operating System	/etc/opt/sun-ssm/hwmgmtd.conf
Windows	C:\Program Files\Sun Microsystems\SSM\Sun Server Hardware Management Agent\conf\hwmgmtd.conf

The Hardware Management Agent records log messages into the log file. These messages can be used to troubleshoot the running status of the Hardware Management Agent. The following table shows the path of the log file.

Operating System	Log File Path
Linux	/var/log/sun-ssm/hwmgmt.d.log
Solaris	/var/opt/sun-ssm/hwmgmt.d.log
Windows	C:\Program Files\Sun Microsystems\SSM\Sun Server Hardware Management Agent\log\hwmgmt.d.log

The level of detail of the messages recorded in the log file depends on the logging level set in the configuration file.

Configuring the Hardware Management Agent Logging Level

To configure the logging level, modify the *hwagentd_log_levels* parameter in the *hwmgmt.d.conf* file. The *hwagentd_log_levels* parameter is a bit flag set expressed as a decimal integer. The following table explains the different logging levels that can be configured using the various bit fields.

Log Level	Bit Code	Messages Logged
EMERG	0x0001	Information about the system being unusable
ALARM	0x0002	Information about any immediate action that must be taken
CRIT	0x0004	Information related to the Hardware Management Agent either not starting or stopping because of critical conditions
ERROR	0x0008	Information related to the Hardware Management Agent either not starting or stopping because of critical conditions
WARNING	0x0010	Information about any conditions that generate a warning, which do not stop the Hardware Management Agent
NOTICE	0x0020	Information related to normal functioning which is significant
INFO	0x0040	Informative messages about normal functioning
DEBUG	0x0080	Verbose debug-level messages, useful in troubleshooting
TRACE	0x0100	Highly verbose debug-level messages, useful in troubleshooting

Note – levels DEBUG and TRACE generate a lot of detailed messages and are designed for troubleshooting. These levels are not recommended for production usage.

For example, when you want to set all logging levels between EMERG and NOTICE, the bit code values of all the required levels must be added and then converted to a decimal value. Referring to preceding table, the addition would be as follows:

$$0x0001 + 0x0002 + 0x0004 + 0x0008 + 0x0010 + 0x0020 = 0x003f$$

Converting this hexadecimal value to decimal equals 63, which is the desired log level. This is the decimal number that should be assigned to the *hwagentd_log_levels* parameter in the *hwmgmt.d.conf* file.

▼ How to Configure the Hardware Management Agent Logging Level

- 1 Depending on the host operating system that the Hardware Management Agent is running on, open the *hwmgmt.d.conf* file from the path shown in the following table. You can use any text editor to modify this file.
- 2 Find the *hwagentd_log_levels* parameter and enter the decimal number calculated using the instructions above.
- 3 Save the modified *hwmgmt.d.conf* file.
- 4 Choose one of the following options to make the Hardware Management Agent reread the *hwmgmt.d.conf* file:
 - On Linux and Solaris operating systems, you can manually restart (Solaris operating system: refresh) the Hardware Management Agent, which forces the *hwmgmt.d.conf* to be reread. Depending on the host operating system that the Hardware Management Agent is running on, restart the Hardware Management Agent.
 - On Windows operating systems, you can restart the service using the Microsoft Management Console Services snap-in.

The Hardware Management Agent rereads the *hwmgmt.d.conf* file with the modified *hwagentd_log_levels* parameter.

(Solaris and Linux) Hardware Management Agent Runtime Options

It is possible to supply command-line options when starting the Hardware Management Agent manually. Use the command line options as follows:

```
hwmgmt.d OPTIONS
```

The command line options are explained in the following table.

Option	Function
-h	Displays the usage message and exits.
-v	Displays the Hardware Management Agent version currently installed on this Oracle server and exits.
-l <i>level</i>	Override the logging level set in the <code>hwmgmtd.conf</code> file with <i>level</i> .

When using the logging levels option, you must supply a decimal number to set the logging level to use. This decimal number is calculated from a bit field, depending on the logging level you want to specify. For more information on the bit field used to configure different log levels see “[Configuring the Hardware Management Agent Logging Level](#)” on page 44.

Configuring your Host Operating System's SNMP

The Hardware Management Agent uses SNMP for network communications. For the Hardware Management Agent to be able to use SNMP correctly on host operating systems, you must ensure that SNMP is configured correctly. On Linux and Solaris operating systems, the `snmpd.conf` file controls network access to the Hardware Management Agent. On Windows operating systems the SNMP service controls network access to the Hardware Management Agent. Incorrect settings can cause the Hardware Management Agent to have limited, or no, network connectivity.

Depending on which operating system you are running the Hardware Management Agent on:

- Linux and Solaris operating systems see “[\(Solaris and Linux\) Configuring Net-SNMP/SMA](#)” on page 46
- Windows operating systems see “[\(Windows\) Configuring SNMP](#)” on page 48

(Solaris and Linux) Configuring Net-SNMP/SMA

Depending on which operating system the Hardware Management Agent has been installed on, you can find the `snmpd.conf` file at the path shown in the following table.

Operating System	Path to <code>snmpd.conf</code>
Linux	<code>/etc/snmp/snmpd.conf</code>
Solaris Operating System	<code>/etc/sma/snmp/snmpd.conf</code>

The exact modifications you need to make to the `snmpd.conf` file depend on which host operating system the Hardware Management Agent is running on. The following procedures explain how to configure SNMP gets, sets, and traps.

Note – the following instructions assume you are using an unmodified `snmpd.conf` file. If you have customized your `snmpd.conf` file, please consider these instructions as a guide to how to make sure your `snmpd.conf` file is compatible with the Hardware Management Agent.

This section covers the following procedures:

- “How to Configure SNMP Gets” on page 47
- “How to Configure SNMP Sets” on page 47
- “How to Configure SNMP Traps” on page 48

▼ How to Configure SNMP Gets

SNMP gets enable you to read data filled by the Hardware Management Agent. To be able to perform SNMP gets, use the following information to modify your `snmpd.conf` file, depending on which host operating system the Hardware Management Agent is running on.

- 1 **Open your `snmpd.conf` file for editing.**
- 2 **Depending on which operating system you are running, choose one of the following options:**

- **For Red Hat Enterprise Linux, add the following line to `snmpd.conf`:**

```
view systemview included .1.3.6.1.4.
```

This adds the Hardware SNMP Plugins to the specified view.

- **For SUSE Linux Enterprise Server, add the following line to `snmpd.conf`:**

```
rocommunity public
```

This adds a read-only community from a network location other than localhost.

▼ How to Configure SNMP Sets

To enable the functionality of setting information via SNMP, use the following information to modify your `snmpd.conf` file, depending on which host operating system the Hardware Management Agent is running on.

- 1 **Open your `snmpd.conf` file for editing.**
- 2 **Depending on which operating system you are running, choose one of the following options:**

- **For SUSE Linux Enterprise Server, VMware ESX and Solaris you should add the following line to `snmpd.conf`:**

```
rwcommunity private
```

By default the public community is blocked as rocommunity on these operating systems.

- For Red Hat Enterprise Linux, change the following line in `snmpd.conf`:
`access notConfigGroup "" any noauth exact systemview none none`
to the following:

```
access notConfigGroup "" any noauth exact systemview systemview none
```

This modification grants write access for the specified view and group. In this example the specified view is `systemview` and the specified group is `NotConfigGroup`. By default, the group uses the public community string.

▼ How to Configure SNMP Traps

- 1 Open your `snmpd.conf` file for editing.
- 2 Depending on the version of SNMP traps you want to send:
 - To be able to send SNMP version 1 traps from the Hardware Management Agent, add the following line to `snmpd.conf`:
`trapsink host communitystring trapport`
 - To be able to send SNMP version 2 traps from the Hardware Management Agent, add the following line to `snmpd.conf`:
`trap2sink host communitystring trapport`

Example 1 Setting SNMP Version 2 Traps

The following example shows the line added to the `snmpd.conf` file to configure SNMP Traps using SNMP version 2:

```
trap2sink 10.18.141.22 public 162
```

(Windows) Configuring SNMP

On Windows operating systems there is not a `snmpd.conf` file. You configure the SNMP service in the Windows Microsoft Management Console Services snap-in.

▼ (Windows) How to Configure SNMP

- 1 From the Start menu Administrative Tools option, select Services.
The Microsoft Management Console Services snap-in opens.
- 2 Double-click the SNMP service.

- 3 On the Security tab, configure the community rights.**
- 4 On the Traps tab, configure the destination you want to send SNMP traps to.**

Oracle Hardware SNMP Plugins

This section contains overviews of the Oracle HW Monitoring Management Information Base (MIB) and the Oracle HW Trap MIB that are implemented by Oracle Hardware SNMP Plugins. This section contains the following:

- “Overview of Oracle HW Monitoring MIB” on page 51
- “Overview of Oracle HW Trap MIB” on page 55
- “Overview of Oracle Storage MIB” on page 55

Overview of Oracle HW Monitoring MIB

The Oracle HW Monitoring Management Information Base (MIB) provides the following details regarding the Oracle server or server module implementing this MIB:

- A hardware inventory of all Field Replaceable Units (FRU) and sensors monitoring different physical parameters on a Oracle server
- Parent/child relationship or containment information of all FRUs and sensors
- Individual status of each sensor as well as combined status of each device type
- Any threshold values configured for each sensor, where applicable
- Details about the service processor
- Information about power total consumption

The MIB can be subdivided into sections, based on the information provided by the various MIB objects. The information that is provided by the various MIB objects is categorized into logically divided groups of scalars, as well as MIB tables. .

For a complete list of all of the objects defined by each group, refer to the comments section defined at the beginning of each group in the `SUN-HW-MONITORING-MIB.mib` file.

The following sections briefly describe each of the MIB sections, with some examples of the objects defined in each group:

- “Oracle Server Product and Chassis” on page 52
- “Oracle Server Service Processor” on page 52
- “Oracle Server Hardware Monitoring MIB” on page 52
- “Oracle Server Hardware Management Agent” on page 52

- “Oracle Server Hardware Inventory” on page 53
- “Oracle Server Hardware Monitor Sensor Group” on page 53
- “sunHwMonIndicatorGroup” on page 54
- “sunHwMonTotalPowerConsumption” on page 55

Oracle Server Product and Chassis

The first two groups, sunHwMonProductGroup and sunHwMonProductChassisGroup, define scalar MIB objects that provide information regarding the Oracle server details such as Part number, Manufacturer, and so on. These groups are:

- sunHwMonProductGroup is a scalar group that provides general product details about the Oracle server or server module, such as the part number, type, name, and serial number.
- sunHwMonProductChassisGroup is a scalar group that provides details about the Oracle server's chassis or the chassis into which the Oracle server has been inserted.

Note – sunHwMonProductChassisGroup is populated only on server modules, where it is relevant.

Oracle Server Service Processor

The Oracle Server Service Processor group consists of one group, sunHwMonSPGroup, which is a scalar group that provides details about the Oracle Integrated Lights Out Management (ILOM) service processor contained in the Server. Information provided by this group includes service processor information such as serial number, Manufacturer, MAC Address, IP details, and Web accessibility information such as URL to access the ILOM Web interface.

Oracle Server Hardware Monitoring MIB

The SUN-HW-MONITORING-MIB group consists of one group, sunHwMonMibGroup, which is a scalar group that provides details about the SUN-HW-MONITORING-MIB itself, such as MIB version number.

Oracle Server Hardware Management Agent

The Oracle Servers Hardware Management Agent group consists of one group, sunHwMonAgentSoftwareGroup, which is a scalar group that provides details about the Oracle Servers Hardware Management Agents associated with this MIB, such as the version of the Agent and the connection status to the ILOM.

Oracle Server Hardware Inventory

The Oracle Servers Hardware Inventory group consists of one group, `sunHwMonInventoryGroup`, which is a group with a MIB table, `sunHwMonInventoryTable`, which provides details about the Oracle server's field replaceable units (FRUs), including their status and the FRU in which they are contained. For each FRU information is provided, such as the name, type, description, part number, status and so on.

Oracle Server Hardware Monitor Sensor Group

The `sunHwMonSensorGroup` contains details about all of the Oracle server's hardware sensors, except indicators. The MIB objects that define the sensor properties are hierarchically and logically grouped based on device type, for example temperature, voltage and so on, as well as sensor type, for example numeric or discrete.

The `sunHwMonSensorGroup` also contains a device-specific group for all significant device types, such as `sunHwMonVoltageGroup`, `sunHwMonCurrentGroup`, and so on. There is also a group for sensors that are not part of any device—specific group.

Each of the groups listed below contains two tables. One table provides details about all of the numeric sensors of this device type and the other table provides details about all of the discrete sensors of corresponding device type on the Oracle server.

The numeric sensors tables provide details about numeric sensors such as the sensor name, sensor type, the current reading, defined thresholds, current status, perceived severity, and the FRU in which the sensor is contained. The discrete sensors tables provide details about discrete sensors, such as sensor name, sensor type, sensor state, perceived severity, and the FRU in which the sensor is contained.

The alarm status of an entity can be one of the following, where critical is the most severe and indeterminate is the least severe.

- critical
- major
- minor
- warning
- cleared
- indeterminate

The `sunHwMonSensorGroup` contains the following groups:

- `sunHwMonSensorAlarmStatusGroup` is a scalar group that provides a single view of the alarm status of the Oracle server and aggregate status per device type such as rolled-up status of all voltage sensors. This is the main value used to obtain the overall status of a server. The individual sensor status is provided by MIB objects that are defined in the corresponding device-specific group.

- sunHwMonVoltageGroup contains two MIB tables that provide details regarding all voltage sensors contained in the Oracle server.
- sunHwMonCurrentGroup contains two MIB tables that provide details regarding all current sensors contained in the Oracle server.
- sunHwMonPowerDeviceGroup contains two MIB tables that provide details regarding all power device sensors contained in the Oracle server.
- sunHwMonCoolingDeviceGroup contains two MIB tables that provide details regarding all cooling device sensors contained in the Oracle server.
- sunHwMonTemperatureGroup contains two MIB tables that provide details regarding all temperature sensors contained in the Oracle server.
- sunHwMonMemoryGroup contains two MIB tables that provide details regarding all memory sensors contained in the Oracle server.
- SunHwMonProcessorGroup contains two MIB tables that provide details regarding all processor sensors contained in the Oracle server.
- sunHwMonHardDriveGroup contains two MIB tables that provide details regarding all hard drive sensors contained in the Oracle server.
- sunHwMonIOGroup contains two MIB tables that provide details regarding all input/output sensors contained in the Oracle server.
- sunHwMonSlotOrConnectorGroup contains two MIB tables that provide details regarding all slot or connector sensors contained in the Oracle server.
- sunHwMonOtherSensorGroup contains two MIB tables that provide details regarding all sensors contained in the Oracle server that are not part of above defined device type groups.

sunHwMonIndicatorGroup

This group contains multiple groups that provide details about the indicators present on the Oracle server. These groups are as follows:

- sunHwMonIndicatorLocator is a scalar group that provides details about the locator indicator, such as the name of the locator indicator sensor and its status. The sunHwMonIndicatorLocatorCurrentStatus MIB object is a read-write MIB object. You can control the locator indicator sensor through an SNMP set command, using a community string with write access.
- sunHwMonIndicatorService is a scalar group that provides details about the service indicator sensor, such as the name of the service indicator sensor and its current status.
- sunHwMonIndicatorAll contains sunHwMonIndicatorTable, which provides details about all indicators present on the Oracle server, such as power supply failure indicator, fan failure indicator and so on.

sunHwMonTotalPowerConsumption

This is a scalar group, which provides details about the Oracle server's total power consumption. The following information is available:

- Sensor name and type
- Current reading
- Defined thresholds
- Current status
- Perceived severity
- The FRU in which the sensor is contained

Note – Data is available here only if the platform has implemented a total power consumption indicator.

Overview of Oracle HW Trap MIB

The Hardware Management Agent uses the Oracle HW Trap MIB to implement SNMP traps. These traps are used to report the environmental state of the Oracle server as well as faults, errors, and other conditions affecting hardware components.

The SNMP traps are categorized into three groups. Any SNMP trap name ending in Ok or Error, as well as any SNMP trap name containing Threshold, is reporting a change in a sensor value.

Any SNMP trap name ending in Fault is reporting a problem detected by the system's fault management subsystem, if such a subsystem is available on the server.

The final group is the status SNMP traps, which report the environmental state and any hardware information that is not covered by the two previous groups.

For more detailed information on the Oracle HW Trap MIB, see the comments in the SUN-HW-TRAP-MIB.mib file.

Overview of Oracle Storage MIB

The Oracle Storage MIB supplements what is available in the Oracle HW Monitoring MIB with storage-related information. The following sections briefly describe each of the MIB sections:

- “Oracle Storage MIB” on page 56
- “Physical and Logical Storage Objects” on page 56

Oracle Storage MIB

The following scalar objects contain identifying information regarding the MIB itself:

- `sunStorageAgentVersion` defines the version of the software implementing the `sunStorageMIB`. The version should be in the following format: *MajorVersion.MinorVersion.SubMinorVersion* (for example: 1.2.3).
- `sunStorageMibVersion` defines the version of the SUN-STORAGE-MIB this agent implements. The version defined should be in the format of *MajorVersion.MinorVersion.SubMinorVersion* (for example: 1.3.0).

Physical and Logical Storage Objects

The following tables list physical and logical storage objects:

- `sunStorageControllerTable`. The storage controller object represents either an on-board or bus-attached storage controller. The properties associated with a controller object describe the type of controller (vendor and model) as well as the features it supports (such as RAID). The table is indexed with an arbitrary integer to uniquely identify each entry. Types of information included for each entry, when available, include:
 - Identifying: name, part number, serial number, manufacturer, model, firmware version, and pci bus address
 - RAID capabilities: levels supported, maximum volumes manageable, number of spares, and stripesizing
 - Status: operational and alarm
- `sunStorageDiskTable`. Each disk object corresponds to one physical disk that is available to the host operating system. Entries in this table might have parent objects in other tables (such as `sunStorageControllerTable`). The table is indexed with `sunHwMonFruIndex`, so that information corresponding to the same physical disk is retrievable from both the `sunHwMonInventoryTable` and `sunStorageDiskTable` at the same index. Types of information included for each entry, when available, include:
 - Identifying: name and OS device name
 - Relational: parent name and index, slot number
 - Descriptive: physical type, interface type, and capacity
 - Status: mapping, RAID, and operational
- `sunStorageVolumeTable`. A logical volume object corresponds to a logical disk visible to the host OS. Only RAID logical volumes are supported. The table is indexed with an arbitrary integer to uniquely identify each entry. Types of information included for each entry, when available, include:
 - Identifying: name, OS device name, and mount point
 - Relational: parent name and index
 - Descriptive: capacity, RAID level, and sizing

- Status: mapping, mounting, RAID parameters, task, and operational
- sunStorageLogicalCompTable. A logical component node represents an active or passive component of its logical device parent. A logical component object is always a direct child of a logical device node. In the case of a RAID logical device, the logical component represents a physical device, or part of a physical device, used to create the specified RAID level. The table is indexed with an arbitrary integer to uniquely identify each entry. Types of information included for each entry, when available, include:
 - Identifying: name, disk name, and index
 - Relational: parent name and index
 - Status: RAID spare and RAID operational

Working With Management Agents

Once the Management Agents are installed on your Oracle Server, you can monitor the server. The Storage Management Agent does not require any further configuration. The Hardware Management Agent provides the SNMP Plugins layer, which enables you to retrieve and set information via SNMP, as well as generate SNMP traps. This section provides the following:

- “Retrieving and Setting Information Through SNMP” on page 59
- “sunHwMonProductGroup” on page 59
- “sunHwMonProductChassisGroup” on page 61
- “sunHwMonSPGroup” on page 61
- “sunHwMonInventoryTable” on page 62
- “sunHwMonSensorGroup” on page 63
- “sunHwMonIndicatorLocator” on page 65
- “Generating SNMP Traps” on page 66

Retrieving and Setting Information Through SNMP

The following section provides some examples of using Net-SNMP's `snmpwalk` utility to get and set information from Oracle servers running the Hardware Management Agent. For more information on the Hardware Management Agent functionality shown here, see “[Overview of Oracle HW Monitoring MIB](#)” on page 51 or the `SUN-HW-MONITORING-MIB.mib` file.

The format of the Net-SNMP `snmpwalk` command is:

```
snmpwalk Application options Common Options OID
```

For more information, see the Net-SNMP documentation.

sunHwMonProductGroup

The `sunHwMonProductGroup` contains information about the server implementing the MIB.

The following procedures are covered in this section:

- “How to Retrieve the Product Information from a Sun x86 Server” on page 60
- “How to Retrieve The Product Information on a Sun x86 Server Module” on page 60

▼ How to Retrieve the Product Information from a Sun x86 Server

- At the command prompt, type the following:

```
# snmpwalk -v2c -c public -mALL localhost\  
SUN-HW-MONITORING-MIB::sunHwMonProductGroup
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonProductName.0 = STRING: SUN FIRE X4440  
SUN-HW-MONITORING-MIB::sunHwMonProductType.0 = INTEGER: rackmount(3)  
SUN-HW-MONITORING-MIB::sunHwMonProductPartNumber.0 = STRING: 602-4058-01  
SUN-HW-MONITORING-MIB::sunHwMonProductSerialNumber.0 = STRING: 0823QBU01C  
SUN-HW-MONITORING-MIB::sunHwMonProductManufacturer.0 = STRING: SUN MICROSYSTEMS  
SUN-HW-MONITORING-MIB::sunHwMonProductSlotNumber.0 = INTEGER: -1  
SUN-HW-MONITORING-MIB::sunHwMonProductUUID.0 = STRING:  
080020FFFFFFFFFFFFFFFF00144FEDE5E0  
SUN-HW-MONITORING-MIB::sunHwMonProductBiosVersion.0 = STRING: S90_3B18
```

Note – On a Sun x86 rack mount server, the following line signifies that there is no slot number (nodef).

```
sunHwMonProductSlotNumber.0 = INTEGER: -1
```

This is expected behavior because slot numbers are relevant only to blade servers. Rackmount servers do not have slot numbers.

▼ How to Retrieve The Product Information on a Sun x86 Server Module

- At the command prompt, type the following:

```
# snmpwalk -v2c -c public -mALL localhost\  
SUN-HW-MONITORING-MIB::sunHwMonProductGroup
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonProductName.0 = STRING: Sun Blade X6250 Server  
Module  
SUN-HW-MONITORING-MIB::sunHwMonProductType.0 = INTEGER: blade(4)  
SUN-HW-MONITORING-MIB::sunHwMonProductPartNumber.0 = STRING: 540-7254-01  
SUN-HW-MONITORING-MIB::sunHwMonProductSerialNumber.0 = STRING: 142300943223
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductManufacturer.0 = STRING: Sun Microsystems Inc
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductSlotNumber.0 = INTEGER: 1
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductUUID.0 = STRING: 080020FFFFFFFFFFFFFFFF01B24782F9C
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductBiosVersion.0 = STRING: S90_3B18
```

sunHwMonProductChassisGroup

This group is filled only on Sun x86 server modules and represents the chassis holding the server module.

▼ How to Retrieve the Sun x86 Server Module's Product Chassis Information

- At the command prompt, type the following:

```
# snmpwalk -v2c -c public -mALL localhost\  
SUN-HW-MONITORING-MIB::sunHwMonProductChassisGroup
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonProductChassisName.0 = STRING: SUN BLADE 6000  
MODULAR SYSTEM
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductChassisPartNumber.0 = STRING: 541-1983-07
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductChassisSerialNumber.0 = STRING:  
1005LCB-0728YM01R7
```

```
SUN-HW-MONITORING-MIB::sunHwMonProductChassisManufacturer.0 = STRING: SUN  
MICROSYSTEMS
```

sunHwMonSPGroup

This group contains information about the ILOM service processor.

▼ How to Retrieve Service Processor Information

- At the command prompt, type the following:

```
# snmpwalk -v2c -c public -mALL localhost\  
SUN-HW-MONITORING-MIB::sunHwMonSPGroup
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonSPSerialNumber.0 = STRING: 1762TH1-0750000707
SUN-HW-MONITORING-MIB::sunHwMonSPManufacturer.0 = STRING: ASPEED
SUN-HW-MONITORING-MIB::sunHwMonSPFWVersion.0 = STRING: 2.0.3.10
SUN-HW-MONITORING-MIB::sunHwMonSPMacAddress.0 = STRING: 0:1b:24:78:2f:a1
SUN-HW-MONITORING-MIB::sunHwMonSPIPAddress.0 = IpAddress: 10.18.141.164
SUN-HW-MONITORING-MIB::sunHwMonSPNetMask.0 = IpAddress: 255.255.255.128
SUN-HW-MONITORING-MIB::sunHwMonSPDefaultGateway.0 = IpAddress: 10.18.141.129
SUN-HW-MONITORING-MIB::sunHwMonSPIPMode.0 = INTEGER: dhcp(2)
SUN-HW-MONITORING-MIB::sunHwMonSPURLToLaunch.0 = STRING:
SUN-HW-MONITORING-MIB::sunHwMonSPSystemIdentifier.0 = STRING:
```

Note – When using ILOM 2.0 the following lines are returned:

```
SUN-HW-MONITORING-MIB::sunHwMonSPURLToLaunch.0 = STRING:
SUN-HW-MONITORING-MIB::sunHwMonSPSystemIdentifier.0 = STRING:
```

This is expected behavior because this information is specific to ILOM 3.0.

sunHwMonInventoryTable

Information about only one FRU, `mb.net0.fru`, is shown in this example.

▼ How to Retrieve Inventory Information

- **At the command prompt, type the following:**

```
# snmpwalk -v2c -c public -mALL localhost\
SUN-HW-MONITORING-MIB::sunHwMonInventoryTable | grep '.148 = '
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonFruName.148 = STRING: /SYS/MB/NET0
SUN-HW-MONITORING-MIB::sunHwMonFruType.148 = INTEGER: networkInterface(80)
SUN-HW-MONITORING-MIB::sunHwMonFruDescr.148 = STRING:
SUN-HW-MONITORING-MIB::sunHwMonFruPartNumber.148 = STRING: 82546GB
SUN-HW-MONITORING-MIB::sunHwMonFruSerialNumber.148 = STRING: 00:14:4F:A8:39:44
```

```
SUN-HW-MONITORING-MIB::sunHwMonFruManufacturer.148 = STRING:
SUN-HW-MONITORING-MIB::sunHwMonFruStatus.148 = INTEGER: indeterminate(6)
SUN-HW-MONITORING-MIB::sunHwMonParentFruIndex.148 = INTEGER: 146
SUN-HW-MONITORING-MIB::sunHwMonParentFruName.148 = STRING: /SYS/MB
```

Note – When using ILOM 2.0 the following lines are returned:

```
SUN-HW-MONITORING-MIB::sunHwMonFruType.75 = INTEGER: unknown(1)
SUN-HW-MONITORING-MIB::sunHwMonParentFruIndex.75 = INTEGER: -1
SUN-HW-MONITORING-MIB::sunHwMonParentFruName.75 = STRING:
```

This is expected behavior because this information is specific to ILOM 3.0. In this case, the -1 signifies nodef.

sunHwMonSensorGroup

In the following example, the numeric sensor MB/V_+12V is retrieved.

▼ How to Retrieve the Sensor Group Information

- **At the command prompt, type the following:**

```
# snmpwalk -v2c -c public -mALL localhost\
SUN-HW-MONITORING-MIB::sunHwMonSensorGroup | grep '\.9 = '
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorType.9 = INTEGER:
voltage(133)
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorName.9 = STRING:
/SYS/MB/V_+12V
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorParentFruIndex.9 = INTEGER:
146
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorParentFruName.9 = STRING:
/SYS/MB
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorAlarmStatus.9 = INTEGER:
cleared(1)
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorStateDescr.9 = STRING:
Normal
```

```
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorCurrentValue.9 = INTEGER:
12160
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorBaseUnit.9 = INTEGER:
volts(4)
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorExponent.9 = INTEGER: -3
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorUpperNonRecoverableThreshold.9
= INTEGER: 14994
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorUpperCriticalThreshold.9 =
INTEGER: 13986
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorUpperNonCriticalThreshold.9
= INTEGER: 12978
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorLowerNonRecoverableThreshold.9
= INTEGER: 8946
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorLowerCriticalThreshold.9 =
INTEGER: 9954
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorLowerNonCriticalThreshold.9
= INTEGER: 10962
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorEnabledThresholds.9 = BITS:
FC lowerThresholdNonCritical(0) upperThresholdNonCritical(1)
lowerThresholdCritical(2) upperThresholdCritical(3) lowerThresholdFatal(4)
upperThresholdFatal(5)
```

Note – When using ILOM 2.0 the following lines are returned:

```
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorType.9 = INTEGER: unknown(1)
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorParentFruIndex.9 = INTEGER:
-1
SUN-HW-MONITORING-MIB::sunHwMonNumericVoltageSensorParentFruName.9 = STRING:
```

This is expected behavior because this information is specific to ILOM 3.0.

Tip – When analyzing the following lines, do not forget that the `sunHwMonNumericVoltageSensorCurrentValue` is returned using the exponent set in `sunHwMonNumericVoltageSensorExponent`.

```
SUN-HW-MONITORING-MIB::
```

```
sunHwMonNumericVoltageSensorCurrentValue.9 = INTEGER: 12290
```

```
SUN-HW-MONITORING-MIB::
```

```
sunHwMonNumericVoltageSensorBaseUnit.9 = INTEGER: volts(4)
```

```
SUN-HW-MONITORING-MIB::
```

```
sunHwMonNumericVoltageSensorExponent.9 = INTEGER: -3
```

This example has an exponent of -3, which means that the voltage value of `sunHwMonNumericVoltageSensorCurrentValue` has to be multiplied by 10^{-3} , resulting in 12.290 volts.

sunHwMonIndicatorLocator

You can get and set the `sunHwMonIndicatorLocator`. In the following example, the `sunHwMonIndicatorLocator` is set to `integer(i)` value 7, which means `fastBlink` for this OID.

▼ How to Set the Indicator Locator

- **At the command prompt, type the following:**

```
# snmpset -v2c -c public -mALL localhost\  
SUN-HW-MONITORING-MIB::sunHwMonIndicatorLocatorCurrentStatus.0 i 7
```

You should see output similar to the following:

```
SUN-HW-MONITORING-MIB::sunHwMonIndicatorLocatorCurrentStatus.0 = INTEGER:  
fastBlinking(7)
```

Generating SNMP Traps

The combination of Hardware Management Agent and Hardware SNMP Plugins enables you to generate SNMP traps. To test this you can use IPMItool to inject a simulated fault. IPMItool is supplied as a component of Hardware Management Pack. An SNMP trap is generated by the Hardware SNMP Plugins.

▼ How to Inject a Simulated Fault

1 At the command prompt, type the following command:

```
ipmitool -U user -P password -H hostname -v sdr list
```

Choose a sensor from the returned list that you want to inject a simulated fault to. In this example the ipmi event: 'P0/VTT' unc assert is used.

2 At the command prompt, type the following command:

```
# ipmitool -U user -P password -H hostname event 'P0/VTT' unc assert
```

which injects the ipmi event: 'P0/VTT' unc assert.

You should receive an SNMP trap similar to the following:

```
sysUpTime.0 = Timeticks: (4300) 0:00:43.00
snmpModules.1.1.4.1.1 = OID: sunHwTrapVoltageNonCritThresholdExceeded
sunHwTrapSystemIdentifier.0 = STRING: sg-prg-x6220-01-sp0
sunHwTrapChassisId.0 = STRING: 1005LCB-0728YM01R7::0739AL71EA
sunHwTrapProductName.0 = STRING: SUN BLADE 6000 MODULAR SYSTEM::SUN BLADE X6220
SERVER MODULE
sunHwTrapComponentName.0 = STRING: /SYS/MB/P0/VTT
sunHwTrapThresholdType.0 = INTEGER: upper(1)
sunHwTrapThresholdValue.0 = STRING:
sunHwTrapSensorValue.0 = STRING:
sunHwTrapAdditionalInfo.0 = STRING: Upper Non-critical going high
sunHwTrapAssocObjectId.0 = OID: zeroDotZero
sunHwTrapSeverity.0 = INTEGER: nonCritical(4)
```

You can verify the SNMP trap by checking the syslog record, which should contain something similar to the following:

```
sg-prg-x6250-01 hwagentd[3470]: P0/VTT (Sensor ID: 0x1b) (Record ID: 0x821):
Upper Non-critical going high.
```

The messages stored in syslog or Windows application log correspond exactly to the SNMP traps. On Linux and Solaris operating systems, the messages are logged with facility daemon and level notice.

Note – If records corresponding to SNMP traps are not being stored on Linux and Solaris operating systems, make sure that the daemon facility and notice level are enabled.

Troubleshooting Management Agents

This section provides tips and solutions for the most common problems you might encounter when working with Management Agents. The section contains:

- [“General Management Agents Troubleshooting” on page 69](#)
- [“Solaris Operating System Troubleshooting” on page 69](#)
- [“Linux Troubleshooting” on page 71](#)

General Management Agents Troubleshooting

The best way to troubleshoot problems with Management Agents is to review the log files.

The Hardware Management Agent stores log information in the `hwagentd.log` file.

For more information on the `hwagentd.log` file, see [“Configuring the Hardware Management Agent Logging Level” on page 44](#).

The Storage Management Agent stores log information in the `storagemgmt.log` file. The following table shows the location of the `storagemgmt.log` file on the currently supported operating systems.

Operating System	Log Path
Linux	<code>/var/log/sun-ssm/storagemgmt.log</code>
Solaris	<code>/var/opt/sun-ssm/storagemgmt.log</code>

Solaris Operating System Troubleshooting

The following topics can help you to identify and solve potential causes of problems when using the Hardware Management Pack on Solaris.

This section covers the following topics:

- [“Issues Installing SUNWssm-hwmgmt-config” on page 70](#)
- [“Issues Installing with pkgadd” on page 70](#)

Issues Installing SUNWssm-hwmgmt-config

If you encounter the following error message from `pkgadd(1M)` while trying to install `SUNWssm-hwmgmt-config`:

```
svccfg: Temporary service "TEMP/application/management/hwagentd" must be deleted before this manifest can be imported.
```

This problem can be caused by a previous installation of `SUNWssm-hwmgmt-config` being interrupted, which can leave the `SMF(5)` registration in an incomplete state. Before attempting another installation, you need to remove the file at `TEMP/application/management/hwagentd`.

▼ How to Solve Problems Using SUNWssm-hwmgmt-config

1 At the command prompt, type the following:

```
svccfg list
```

If you see `TEMP/application/management/hwagentd` listed in the output then proceed to delete the file by typing the following at the command prompt:

```
svccfg delete TEMP/application/management/hwagentd
```

2 Type the following:

```
svccfg list
```

You should no longer see `TEMP/application/management/hwagentd` listed.

3 Remove the packages by typing the following:

```
pkgrm SUNWssm-hwmgmt-config
```

You should now be able to install `SUNWssm-hwmgmt-config`.

Issues Installing with pkgadd

When using `pkgadd(1M)` during installation, if you encounter the following error message:

```
#Waiting for up to <300> seconds for package administration commands to become available (another user is administering packages on zone <XXX>)
```

An interruption of the `pkgadd(1M)` process can leave an outstanding packaging lock file, which blocks further use of the `pkgadd(1M)` command. Before attempting another installation, you need to remove the packaging lock file.

▼ How to Remove a Packaging Lock File

1 At the command prompt, type the following:

```
svccfg list
```

If you see TEMP/application/management/hwagentd listed in the output then proceed to delete the file by typing the following at the command prompt:

```
svccfg delete TEMP/application/management/hwagentd
```

2 Type the following:

```
svccfg list
```

You should no longer see TEMP/application/management/hwagentd listed.

3 Remove the packages by typing the following:

```
pkgrm SUNWssm-hwmgmt-config
```

You should now be able to install SUNWssm-hwmgmt-config.

Linux Troubleshooting

The following topics can help you to identify and solve potential causes of problems when using the Hardware Management Pack on Linux.

This section covers the following topics:

- “Hardware Management Agent Service Fails to Start” on page 71
- “Hardware Management Agent Service Status Dead” on page 72
- “No Disk Information is Shown in the ILOM CLI” on page 72

Hardware Management Agent Service Fails to Start

After installing the Hardware Management Agent on SUSE Linux Enterprise, you may encounter the following:

```
Starting Sun HW agent services: . . . . . failed
```

In addition, there may be line in the Hardware Management Agent log file similar to the following:

```
(hwagentd_poller.c:334:hwagent_bmc_response_test):Unable to reach the KCS interface over ipmitool-hwagentd.
```

This problem is most likely occurring because the IPMI device drivers have not been installed. Hardware Management Agent uses the IPMI drivers to access the KCS interface.

▼ How to Solve Issues With IPMI Device Drivers

- 1 Install an IPMI system such as OpenIPMI which provides device drivers for full access to IPMI information.
- 2 Start the Hardware Management Agent.

Hardware Management Agent Service Status Dead

After installing the Hardware Management Agent on Red Hat Enterprise Linux, the hwagentd service starts but you encounter something similar to the following:

```
/etc/init.d/hwagentd start  
  
Starting Sun HW agent services: . . . . . [ OK ]  
  
/etc/init.d/hwagentd status  
  
hwagentd dead but subsys locked
```

In addition, there may be a line in the Hardware Management Agent similar to the following:

```
hwagentd_poller.c:334:hwagent_bmc_response_test):Unable to reach the KCS  
interface over ipmitool-hwagentd.
```

This problem is most likely occurring because the IPMI device drivers have not been installed. Hardware Management Agent uses the IPMI drivers to access the KCS interface.

Solution: Install an IPMI system such as OpenIPMI which provides device drivers for full access to IPMI information.

▼ How to Solve Issues with IPMI Device Drivers

- 1 Install an IPMI system such as OpenIPMI which provides device drivers for full access to IPMI information.
- 2 Start the Hardware Management Agent.

No Disk Information is Shown in the ILOM CLI

After installing and starting Storage Management Agent, there is no disk information shown in the ILOM CLI. In addition, there may be the following line in the Storage Management Agent log file:

Failed to get status from SP, error code = 1

This problem is can occur because IPMI device drivers have not been installed. It is also possible that a supported ILOM version is not installed on the service processor.

▼ **How to Solve Issues with IPMI Device Drivers**

- 1 **Install an IPMI system such as OpenIPMI which provides device drivers for full access to IPMI information.**
- 2 **Start the Storage Management Agent.**

Index

C

- Configuration File, Hardware Management Agent, 43
- Configure
 - Hardware Management Agent, 43–49
 - Host Operating System's SNMP, 46
 - Log Level, 44
 - SNMP Gets, 47
 - SNMP Sets, 47–48
 - SNMP Traps, 48
 - Windows SNMP, 48
- Configure Net-SNMP
 - Linux, 46
 - Solaris, 46
- console mode installation, 33–38
- console mode uninstall, 38–39

D

- documentation links, 5

F

- feedback, 5

G

- GUI mode installation, 16–26
- GUI mode uninstall, 26–33

H

- Hardware Management Agent
 - Configuration File, 43
 - Configure, 43–49
 - Configure SNMP, 46
 - Log File, 43
 - Runtime Options, 45
- Hardware SNMP Plugins, 51–57
- hwagentd.conf, 43
- hwagentd.log, 43
- hwagentd_log_levels, Parameter, 44
- hwmgmt.conf, 43
- hwmgmt.log, 43

I

- Installer
 - getting software, 15
 - prerequisites, 13
- installing
 - Hardware Management Pack
 - using console mode, 33–38
 - using GUI mode, 16–26
 - using silent mode, 39–40
- IPMItool, 66

L

- Linux
 - Configure Net-SNMP, 46

Linux (Continued)

- SNMP Gets, 47
- SNMP Sets, 47–48
- SNMP Traps, 48
- Troubleshooting, 71
- Log File, Hardware Management Agent, 43
- Log Level, Configure, 44

M

- Management Information Base, 51–57
 - Sun Hw Monitoring, 51
 - Sun Hw Trap MIB, 55
- MIB, *See* Management Information Base

P

- Prerequisites for installation, 13

R

- Runtime Options, Hardware Management Agent, 45

S

- Sensor, Severity, 53
- Severity, Sensor, 53
- silent mode installation, 39–40
- silent mode installation options, 39
- silent mode uninstall, 41
- SNMP, 9
 - Configure, 46
 - Generating Traps, 66
 - Retrieving and Setting Information Through, 59
- SNMP Gets, 47
- SNMP Sets, 47–48
- SNMP Traps, 48
- snmpd.conf, 46, 47, 48
- snmpwalk, 59
- Solaris
 - Configure Net-SNMP, 46

Solaris (Continued)

- SNMP Sets, 47–48
- SNMP Traps, 48
- Troubleshooting, 69
- Sun Hw Monitoring MIB
 - Interaction, 9
 - Overview, 51
- Sun Hw Trap MIB
 - Interaction, 9
 - Overview, 55
- Sun Server Hardware Management Agent, 9
- Sun Server Hardware SNMP Plugins, 9, 10
- Sun Server Management Agents, 9–11
- Syslog, 66
- System Event Log, 9

T

- Troubleshooting, 69–73

U

- uninstalling
 - Hardware Management Pack
 - using console mode, 38–39
 - using GUI mode, 26–33
 - using silent mode, 41

W

- Windows, SNMP, 48