Sun Server Management Agents User's Guide

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Contents

Preface

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

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

- "Related Books" on page 7
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Related Books

The following is a list of documents related to single server management for your Sun server. These and additional support documents are available on the web at:

http://docs.sun.com/app/docs/prod/svrmgmt.pack

Document	Description
Sun Server Hardware Management Pack User's Guide	Overview of Sun Server Hardware Management Pack and how to install components
Sun Server Management Agent User's Guide	How to install, configure, and work with Sun Server Management Agents
Sun Server CLI Tools and IPMItool User's Guide	How to install, configure, and work with Sun Server CLI Tools and IPMItool

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, appendixes or section numbering.

Related Third-Party Web Site References

Third-party URLs are referenced in this document and provide additional, related information.

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Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. To share your comments, go to `http://docs.sun.com` and click Feedback.

Change History

The following changes have been made to the documentation set.

- December 2009, initial publication.

Introduction to Sun Server Management Agents

This guide provides an overview of Sun Server Management Agents (Management Agents) and how to use them with your Sun servers. This section of the guide provides an overview of Management Agents and contains the following:

- "Sun Server Management Agents Features" on page 9
- "Sun Server Hardware Management Agent" on page 9
- "Sun Server Hardware SNMP Plugins" on page 10
- "Sun Server Storage Management Agent" on page 11

Sun Server Management Agents Features

Sun Server Management Agents provide operating-system-specific agents to enable management of your Sun servers.

The Sun Server Management Agents component provides the following software:

- Sun Server Hardware Management Agent
- Sun Server Hardware SNMP Plugins
- Sun Server Storage Management Agent
- Sun Server Storage Access Libraries

Sun Server Hardware Management Agent

The Sun Server Hardware Management Agent (Hardware Management Agent) and associated Sun Server Hardware SNMP Plugins (Hardware SNMP Plugins) provide a way to monitor your Sun x64 Server and server module's hardware. With the Hardware Management Agent and Hardware SNMP Plugins you can use SNMP to monitor the Sun x64 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 your Sun x64 servers and server modules.

The Hardware Management Agent and Hardware SNMP Plugins run on the host operating system of Sun x64 servers and use the keyboard controller-style (KCS) interface to communicate with the service processor. By regularly polling the service processor,

information about the current state of the Sun server is fetched automatically by the Hardware Management Agent. This information is then made available through SNMP, using the Hardware SNMP Plugins.

The Hardware Management Agent polls the service processor for hardware information over the KCS interface. The Hardware Management Agent is visible on the network through the Hardware SNMP Plugins. The SUN-HW-MONITORING-MIB Net-SNMP plugin communicates over a socket to the Hardware Management Agent daemon service, called hwmgmtd. 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.. 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.

Sun Server Hardware SNMP Plugins

The Sun Server Hardware SNMP Plugins consist of two Net-SNMP plugins. These Net-SNMP plugins are compiled versions of two Sun-specific hardware Management Information Bases (MIB) that have been designed to enable you to monitor your Sun x64 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
- Control the system locator
- Inventory including basic manufacturing information
- Product and chassis information such as serial number, part number, and so on
- Per-sensor alarm status

The Sun HW Trap MIB describes a set of traps for hardware events that can be generated by a Sun x64 Server and provides the following information:

- Conditions affecting the environmental state of the server, such as overheating of a server or its components, voltage or current for components being out of range, and so on

- Error conditions affecting the hardware components in the server such as FRU insertion/removal, security intrusion notification and so on

Sun Server Storage Management Agent

The Sun Server Storage Management Agent (Storage Management Agent) includes an operating-system-level daemon that gathers information about storage devices such as hard drives and RAID arrays, and sends it to the ILOM service processor. Once the Storage Management Agent is installed and running, it operates without user intervention. The ILOM service processor allows you to view the information provided by Storage Management Agent using the CLI. See your ILOM service processor documentation for details.

Installing Components

This section describes how to install and uninstall Hardware Management Pack components on a Sun x64 server using the supplied Sun Server Component Manager. This section contains the following:

Getting Started

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

- Use the Sun Server Component Manager in interactive mode. This enables you to choose the installation options from a command-line interface.

- Use the Sun Server Component Manager in unattended mode. This enables you to perform an unattended installation.

Regardless of the installation method you choose, the installation must be carried out as a user with administrative privileges, such as root.

Prerequisites

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 supported platforms information available at the following web site:

http://www.sun.com/systemmanagement/managementpack_supportmatrix.jsp

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

- Solaris operating system - For the Sun Server 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 Sun Server 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 Sun x64 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 Sun Server 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.

Note – If you have installed an earlier version of Hardware Management Pack on a Linux or Solaris operating system, you must manually uninstall the earlier version before installing the latest version.

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 Sun server from:

http://www.sun.com/system-management/os-hw-mgmt

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:

sun-ssm-mgmt-pack-*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 Sun x64 server that you want to manage.

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

Sun SSM Component Manager Overview

Sun SSM Component Manager (Component Manager) is supplied as part of the Hardware Management Pack. Component Manager is a command-line application that enables you to install and uninstall the Hardware Management Pack components, as well as inspect the currently installed and available components. Depending on the operating system you are using there are different methods of working with Component Manager.

On Linux and Solaris operating systems Component Manager is installed. You should follow these procedures:

- "(Linux and Solaris Operating Systems) How to Install Component Manager" on page 15
- Install components by either "(Linux and Solaris Operating Systems) Using Component Manager in Interactive Mode" on page 16 or "(Linux and Solaris Operating Systems) Using Component Manager in Unattended Mode" on page 19

On Windows operating systems Component Manager is an executable which is copied to the install directory when at least one component is installed. You should follow this procedure "(Windows Operating Systems) Using Component Manager" on page 21.

(Linux and Solaris Operating Systems) Using Component Manager

To use the Component Manager on Linux and Solaris operating systems, you must first install the Component Manager. Once the Component Manager is installed, you can choose to either install components interactively using a command-line interface or automatically using command-line switches, which enables unattended installs.

▼ (Linux and Solaris Operating Systems) How to Install Component Manager

Before You Begin You must download and uncompress the Hardware Management Pack on the target server before proceeding. The following procedure must be carried out as a user with root privileges.

1   Open a terminal.

2   Navigate to the directory where you uncompressed the Hardware Management Pack package, then navigate to the SOFTWARE subdirectory .

3   Type the following:

```
./setup.sh
```

The Component Manager installer starts.

4   To confirm that you want to install Component Manager, type Y at the following message:

```
Install the Sun SSM Component Manager? [Y]es, [N]o>
```

Component Manager is installed on to the server at the following path:

```
/usr/sbin/sunssmcompmgr
```

When the installation of Component Manager is finished, the installer asks if you want to automatically start Component Manager in interactive mode.

Next Steps   Once you have installed Component Manager you can choose to either use the interactive mode or unattended mode. For more information see:

- "(Linux and Solaris Operating Systems) Using Component Manager in Interactive Mode" on page 16
- "(Linux and Solaris Operating Systems) Using Component Manager in Unattended Mode" on page 19

(Linux and Solaris Operating Systems) Using Component Manager in Interactive Mode

When using Component Manager in interactive mode, you can work with components from a interactive command-line interface.

Note – On Windows operating systems interactive mode is not available. See "(Windows Operating Systems) Using Component Manager" on page 21

The following table shows the available functions when using the Component Manager interactively.

Option	Functionality
[L]ist	Displays the list of currently available components

Option	Functionality
[D]etailed list	Displays detailed information about the list of currently available components
[I]nstall	Enables you to install some or all of the available components
[U]ninstall	Enables you to uninstall some or all of the currently installed components
[H]elp	Displays information about how to use Component Manager
[Q]uit	Exits Component Manager

Options are chosen in the Component Manager by typing the letter shown between the [] characters.

▼ (Linux and Solaris Operating Systems) How to Install Interactively Using Component Manager

Before You Begin   You must install the Component Manager before proceeding. The following procedure must be carried out as a user with root privileges. If you have installed a previous version of Hardware Management Pack, you must manually uninstall the earlier version before installing the latest version. Component Manager detects older versions of Hardware Management Pack during the install procedure, but does not upgrade the system due to changes in the packaging of this release.

1   **Open a terminal.**

2   **Within the directory where you uncompressed the Hardware Management Pack download, navigate to the Packages subdirectory in the SOFTWARE subdirectory.**

3   **Start the Component Manager in interactive mode by typing the following command:**

`/usr/sbin/sunssmcompmgr`

Component Manager starts and displays a list of currently installed components and available components in the Packages subdirectory.

Tip – The option -d *directory* specifies a directory that Component Manager searches for available components.

---

4   **To install the components shown in the list of available components, type I at the following message:**

`[L]ist, [D]etailed list, [I]nstall, [U]ninstall, [H]elp or [Q]uit >`

A numbered list of the available components is displayed.

5 **Choose one of the following options:**

- **To install a single specific component, type the number listed to the right of the component name.**

- **To install all of the listed components, type A.**

- **To return to the previous menu, type R.**

6 **Depending on the component you chose to install in step 5, you might need to specify further options, such as these:**

- ```
  Do you wish to start the hwmgmtd service ? [Y]es, [N]o >
  ```
  To start or restart the named service, type Y.

- ```
  Do you wish to enable the hwmgmtd service on startup by default ? [Y]es, [N]o
  >
  ```
  To start the named service each time the server starts, type Y.

▼ (Linux and Solaris Operating Systems) How to Uninstall Interactively Using Component Manager

1 **Open a terminal.**

2 **Start the Component Manager in interactive mode by typing the following command:**

`/usr/sbin/sunssmcompmgr`

Component Manager starts and displays a list of currently installed components.

3 **To uninstall the components shown in the list of available components, type U at the following message:**

`[L]ist, [D]etailed list, [I]nstall, [U]ninstall, [H]elp or [Q]uit >`

A numbered list of the available components is displayed.

4 **Choose one of the following options:**

- **To uninstall a single specific component, type the number listed to the right of the component name.**

- **To uninstall all of the listed components, type A.**

- **To return to the previous menu, type R.**

(Linux and Solaris Operating Systems) Using Component Manager in Unattended Mode

Component Manager provides an unattended mode that enables you to work with Hardware Management Pack components from the command-line.

On Linux and Solaris operating systems Component Manager provides the following command line options.

Options and Actions	Functionality
-h	Display help on using the Component Manager.
-v	Display the Component Manager's version information.
-d *directory*	Specify a custom directory for the component packages. The default option is to search for component packages in the current directory.
-l *log*	Specify a custom file for logging.
-s	Disable service manipulation (start, restart, or stop) during component installation and uninstallation.
-C	Print information on both the already installed and available components.
-D	Print detailed information on both the already installed and available components.
-I *COMPONENT1:COMPONENT2*	Install components. Component names are separated by a colon (:). If "ALL" is given as the component list, all available components are installed.
-U *COMPONENT1:COMPONENT2*	Uninstall components. Component names are separated by a colon (:). If "ALL" is given as the component list, all available components are installed.

When using the -I or -U options to list components to install or uninstall, you should separate the component names using the colon (:) character. Component names are shown when using the -C or -D options and are listed in square brackets.

▼ (Linux and Solaris Operating Systems) How to Install Using Component Manager in Unattended Mode

When using the Component Manager in unattended mode, components can be installed separately or all components can be installed. Component Manager can provide a list of available components found in the Packages subdirectory. You can also configure whether Component Manager automatically starts the services associated with components.

1   Open a terminal.

2   Within the directory where you uncompressed the Hardware Management Pack download, navigate to the Packages subdirectory in the SOFTWARE subdirectory.

Tip – Use the `-d` *directory* option to pass Component Manager an alternative directory to use for the component packages instead of navigating to the Packages subdirectory.

3   List the available components by typing the following command:

```
/usr/sbin/sunssmcompmgr -C
```

The list of available components is displayed in the terminal. The exact name of the component to use in the next step is shown in square brackets, for example [*component name*].

4   Choose one of the following options:

- **To install selected components in unattended mode, type the following command:**

  ```
  sunssmcompmgr -I COMPONENT1:COMPONENT2
  ```

  Where *COMPONENT1:COMPONENT2* is the list of components to install, separated by colons (:).

- **To install all available components in unattended mode, type the following command:**

  ```
  sunssmcompmgr -I ALL
  ```

  The selected components are installed.

▼ (Linux and Solaris Operating Systems) How to Uninstall using Component Manager in Unattended Mode

1   Open a terminal.

2   List the currently installed components by typing the following command:

```
/usr/sbin/sunssmcompmgr -C
```

Tip – Use the `-D` option to get detailed information on the currently installed components.

The currently installed components are listed. The exact name of the component to use in the next step is shown in square brackets, for example [*component name*].

3   **Choose one of the following options:**

- **To uninstall selected components in unattended mode, type the following command:**

  `/usr/sbin/sunssmcompmgr -U` *COMPONENT1:COMPONENT2*

  Where *COMPONENT1:COMPONENT2* is the list of components to install, separated by a colon (:) character.

- **To uninstall all installed components in unattended mode, type the following command:**

  `/usr/sbin/sunssmcompmgr -U ALL`

  The selected components are uninstalled.

(Windows Operating Systems) Using Component Manager

When using Component Manager on Windows operating systems only the unattended mode is available. When passing options and actions to Component Manager in unattended mode, observe the following conventions:

`sunssmcompmgr.exe [/h /v /s] [/r dir] [/d dir] [/l log] [ACTION]`

The following table lists the functionality of the unattended mode options and actions.

Options and Actions	Functionality
/h	Display help on using the Component Manager.
/v	Display the Component Manager's version information.
/d *directory*	Specify a custom directory for the component packages. The default option is to search for component packages in the current directory.
/l *log*	Specify a custom file for logging.
/s	Disable service manipulation (start, restart or stop) during component installation and uninstallation.
/C	Print information on both the already installed and available components.
/D	Print detailed information on both the already installed and available components.
/I *COMPONENT1 COMPONENT2*	Install components. Component names are separated by a space character. If "ALL" is given as the component list, all available components are installed.
/U *COMPONENT1 COMPONENT2*	Uninstall components. Component names are separated by a space character. If "ALL" is given as the component list, all available components are installed.

When using the /I or /U options to list components to install or uninstall, you should separate the component names using the space character. Component names are shown when using the /C or /D options.

▼ (Windows Operating Systems) How to Install Using Component Manager

When using the Component Manager in unattended mode, components can be installed separately or all components can be installed. Component Manager can provide a list of available components found in the Packages subdirectory. You can also configure whether Component Manager automatically starts the services associated with components or not.

1   Open a terminal.

2   Within the directory where you uncompressed the Hardware Management Pack download, navigate to the SOFTWARE subdirectory.

Tip – you can use the /d *Directory* option to pass component manager an alternative directory to use for the component packages instead of navigating to the Packages subdirectory.

---

3   List the available components by typing the following command:

```
sunssmcompmgr /C
```

The list of available components is displayed in the terminal.

4   Choose one of the following options:

■ **To install selected components, start the Component Manager in unattended mode by typing the following command:**

```
sunssmcompmgr /I COMPONENT1 COMPONENT2
```

Where *COMPONENT1 COMPONENT2* is the list of components to install, separated by spaces.

Note – if any components are already installed you must use this method rather than using the ALL flag.

■ **To install all available components, start the Component Manager in unattended mode by typing the following command:**

```
sunssmcompmgr /I ALL
```

The selected components are installed.

▼ (Windows Operating Systems) How to Uninstall Using Component Manager

1 Open a terminal.

2 List the currently installed components by typing the following command:

```
sunssmcompmgr /C
```

The available and currently installed components are listed.

Tip – You can also use the /D option to get detailed information on the currently installed components.

---

3 Choose one of the following options:

- **To uninstall selected components in unattended mode, type the following command:**

  ```
  sunssmcompmgr /U COMPONENT1 COMPONENT2
  ```

  Where *COMPONENT1 COMPONENT2* is the list of components to install, separated by space characters.

- **To uninstall all available components in unattended mode, type the following command:**

  ```
  sunssmcompmgr /U ALL
  ```

  The selected components are uninstalled.

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 25
- "Configuring the Hardware Management Agent Logging Level" on page 26
- "How to Configure the Hardware Management Agent Logging Level:" on page 27
- "(Solaris and Linux Operating Systems) Hardware Management Agent Runtime Options" on page 27
- "Configuring your Host Operating System's SNMP" on page 28
- "(Solaris and Linux Operating Systems) Configuring Net-SNMP/SMA" on page 28
- "(Windows Operating Systems) Configuring SNMP" on page 30

Hardware Management Agent Configuration File

Once the Hardware Management Agent and Hardware SNMP Plugins are installed on the Sun x64 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/hwagentd.conf`
Solaris Operating System	`/etc/opt/sun-ssm/hwagentd.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/hwagentd.log`
Solaris	`/var/opt/sun-ssm/hwagentd.log`
Windows	`C:\Program Files\Sun Microsystems\SSM\Sun Server Hardware Management Agent\log\hwmgmtd.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 `hwagentd.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 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 `hwagentd.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** `hwagentd.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** `hwagentd.conf` **file.**

4 **Choose one of the following options to make the Hardware Management Agent reread the** `hwagentd.conf` **file:**

- **On Linux and Solaris operating systems, you can manually restart (Solaris operating system: refresh) the Hardware Management Agent, which forces the** `hwagentd.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 `hwagentd.conf` file with the modified *hwagentd_log_levels* parameter.

(Solaris and Linux Operating Systems) 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:

`hwagentd` *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 Sun x64 Server and exits.
-l *level*	Override the logging level set in the hwagentd.conf file with *level*.

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 26.

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 Operating Systems) Configuring Net-SNMP/SMA" on page 28
- Windows operating systems see "(Windows Operating Systems) Configuring SNMP" on page 30

(Solaris and Linux Operating Systems) 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 snmpd.conf
Linux	/etc/snmp/snmpd.conf
Solaris Operating System	/etc/sma/snmp/snmpd.conf

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.

▼ 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** snpd.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 31
  ```

  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** snpd.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 communitystringtrapport*

- **To be able to send SNMP version 2 traps from the Hardware Management Agent, add the following line to** `snmpd.conf`**:**

  trap2sink *host communitystringtrapport*

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 Operating Systems) 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 Operating Systems) 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.**

Sun Server Hardware SNMP Plugins

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

- "Overview of Sun HW Monitoring MIB" on page 33
- "Sun Server Product and Chassis" on page 34
- "Sun Server Service Processor" on page 34
- "Sun Server Hardware Monitoring MIB" on page 34
- "Sun Server Hardware Management Agent" on page 34
- "Sun Server Hardware Inventory" on page 35
- "Sun Server Hardware Monitor Sensor Group" on page 35
- "sunHwMonIndicatorGroup" on page 36
- "sunHwMonTotalPowerConsumption" on page 37
- "Overview of Sun HW Trap MIB" on page 37

Overview of Sun HW Monitoring MIB

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

- A hardware inventory of all Field Replaceable Units (FRU) and sensors monitoring different physical parameters on a Sun 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. The following sections briefly describe each of the MIB sections, with some examples of the objects defined in each group.

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.

Sun Server Product and Chassis

The first two groups, sunHwMonProductGroup and sunHwMonProductChassisGroup, define scalar MIB objects that provide information regarding the Sun 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 Sun server or server module, such as the part number, type, name, and serial number.
- sunHwMonProductChassisGroup is a scalar group that provides details about the Sun server's chassis or the chassis into which the Sun server has been inserted.

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

Sun Server Service Processor

The Sun Server Service Processor group consists of one group, sunHwMonSPGroup, which is a scalar group that provides details about the Sun Server 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.

Sun 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.

Sun Server Hardware Management Agent

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

Sun Server Hardware Inventory

The Sun Servers Hardware Inventory group consists of one group, sunHwMonInventoryGroup, which is a group with a MIB table, sunHwMonInventoryTable, which provides details about the Sun 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.

Sun Server Hardware Monitor Sensor Group

The sunHwMonSensorGroup contains details about all of the Sun x64 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 Sun x64 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 Sun 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 Sun Server.

- sunHwMonCurrentGroup contains two MIB tables that provide details regarding all current sensors contained in the Sun Server.

- sunHwMonPowerDeviceGroup contains two MIB tables that provide details regarding all power device sensors contained in the Sun Server.

- sunHwMonCoolingDeviceGroup contains two MIB tables that provide details regarding all cooling device sensors contained in the Sun Server.

- sunHwMonTemperatureGroup contains two MIB tables that provide details regarding all temperature sensors contained in the Sun Server.

- sunHwMonMemoryGroup contains two MIB tables that provide details regarding all memory sensors contained in the Sun Server.

- SunHwMonProcessorGroup contains two MIB tables that provide details regarding all processor sensors contained in the Sun Server.

- sunHwMonHardDriveGroup contains two MIB tables that provide details regarding all hard drive sensors contained in the Sun Server.

- sunHwMonIOGroup contains two MIB tables that provide details regarding all input/output sensors contained in the Sun Server.

- sunHwMonSlotOrConnectorGroup contains two MIB tables that provide details regarding all slot or connector sensors contained in the Sun Server.

- sunHwMonOtherSensorGroup contains two MIB tables that provide details regarding all sensors contained in the Sun 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 Sun 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 Sun server, such as power supply failure indicator, fan failure indicator and so on.

sunHwMonTotalPowerConsumption

This is a scalar group, which provides details about the Sun 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 Sun HW Trap MIB

The Hardware Management Agent uses the Sun HW Trap MIB to implement SNMP traps. These traps are used to report the environmental state of the Sun x64 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 Sun HW Trap MIB, see the comments in the SUN-HW-TRAP-MIB.mib file.

Working With Management Agents

Once the Management Agents are installed on your Sun x64 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 39
- "sunHwMonProductGroup" on page 39
- "sunHwMonProductChassisGroup" on page 41
- "sunHwMonSPGroup" on page 41
- "sunHwMonInventoryTable" on page 42
- "sunHwMonSensorGroup" on page 43
- "sunHwMonIndicatorLocator" on page 45
- "Generating SNMP Traps" on page 46

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 Sun x64 servers running the Hardware Management Agent. For more information on the Hardware Management Agent functionality shown here, see "Overview of Sun HW Monitoring MIB" on page 33 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.

▼ How to Retrieve the Product Information from a Sun x64 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 x64 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 x64 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:
080020FFFFFFFFFFFFFF001B24782F9C
```

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

sunHwMonProductChassisGroup

This group is filled only on Sun x64 server modules and represents the chassis holding the server module.

▼ How to Retrieve the Sun x64 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

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 26.

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	`/var/log/sun-ssm/storagemgmt.log`
Solaris	`/var/opt/sun-ssm/storagemgmt.log`

Solaris Operating System Troubleshooting

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

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 seeTEMP/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 information can help you to identify and solve potential causes of problems when using the Hardware Management Pack on Linux.

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.**

Release Notes

This section provides the release notes for the current version of Management Agents. Where appropriate, CR reference numbers are provided. Quote these numbers in any contact with Sun support.

Component Manager Issues

This section provides information on potential issues you could encounter when using Component Manager.

Windows Component Manager Incorrect Parameter Error

When passing options and actions to Component Manager on Windows you must ensure that you enter the options and action in the correct order. This is related to CR6914302.

Windows Component Manager Issues Using `/I ALL`

When using the Windows Component Manager on a server that already has a component installed, the `/I ALL` action does not install all remaining available components. This is related to CR 6914563. A workaround is to install the remaining components by listing their names explicitly.

Storage Management Agent Service Running on Unsupported Platforms

The Storage Management Agent service runs on unsupported servers, the data is not utilized by ILOM Storage Viewer. This is related to CR6909880.

Differences in Hardware Management Agent SNMP Traps

The following differences have been found between the SNMP traps sent by Hardware Management Agent and ILOM service processors:

- When sunHwTrapProductName is sent from the service processor, it can be empty due to a platform bug. However if the service processor provides it, Hardware Management Agent also provides it.

- In the Hardware Management Agent SNMP traps, sunHwTrapSystemIdentifier is empty when using ILOM 2.0 versions.

- When sunHwTrapAssocObjectId is sent by Hardware Management Agent it is always SNMPv2-SMI::zeroDotZero, which can differ from the service processor trap.

- sunHwTrapComponentName is sent with different formatting.

- sunHwTrapThresholdValue and sunHwTrapSensorValue are not the same and sometimes do not provide sufficient information from Hardware Management Agent. This is due to CR 6811841.

- On Sun Fire X4200 M2 servers, Hardware Management Agent sends `sunHwTrap \Component OK | Error` instead of `sunHwTrapSlotOr \ Connector Ok | Error`, which is sent by the service processor.

- On some platforms the disk state information is expressed as sunHwTrapHardDriveError when sent from the service processor and as sunHwTrapHardDriveStatus when sent from Hardware Management Agent. This is due to CR 6811826.

- When a power cable is unplugged from a power supply, a sunHwTrapPowerSupplyOk trap is sent. But when the power cable is plugged in to the power supply a sunHwTrapPowerSupplyError trap is sent. This is due to CR 6762982.

Red Hat Installation Dependencies

During an automatic installation on Red Hat Enterprise Linux, the Net-SNMP server is not automatically started. This is due to a dependency failure. You must solve this before running the Hardware Management Agent.

Red Hat Conflict with SElinux

On Red Hat Enterprise Linux there is a conflict with SElinux, which is enabled by default. This conflict causes prevents libraries being loaded by SNMPD. To avoid this, either disable SELinux or create a policy which enables SNMPD to access these files.

Install Path Issues

On all operating systems, if you modify the installation path of the Hardware Management Agent, you must ensure that the path is no longer than 70 characters. In addition the path can not be longer than 70 characters or contain any white spaces, any of these characters ?-, _, ., /, or alphanumeric characters.

Missing Disk Information

Current versions of ILOM do not supply any disk information. Therefore no disk information is visible through the Hardware Management Agent.

Sun X6250 Server Module Wrong Service Processor Version Number

On Sun X6250 server modules, the wrong version of service processor is reported. You are recommended to upgrade to the latest firmware.

Gaps in sunHwMonInventoryGroup

Some values in sunHwMonInventoryGroup are not properly populated.

Gaps in sunHwMonSensorGroup

Some tables in this group are not populated, but this is not a bug. Certain groups, such as sunHwMonProcessorGroup, are empty because no sensor fits into this table for a particular platform. However this does not mean this platform does not monitor the corresponding entities, rather the sensors fit into a more appropriate table, such as temperature, voltage or current.

SunHwMonInventoryTable Shows Incorrect Number of DIMMs

On some platforms, due to CR 6846770 for ILOM, DIMMs which are not present in the system are shown in sunHwMonInvetoryTable. DIMMs which are really present in the system have FruDescr, FruPartNumber, FruSerialNumber and FruManuacturer filled in. Those which are not present can be safely ignored.

SunHwMonDiscreteHardDriveSensorTable Incorrect Sensors

Due to platform limitations, sunHwMonDiscreteHardDriveSensorTable can contain sensors for disks not physically present on the host. These sensors have a ParentFruIndex of -1 and end with STATE-HIDDEN. These sensors can be safely ignored.

Enterprise Field is Populated with Incorrect OID

On Solaris, as well as VMware ESX 3.5, Red Hat Enterprise Linux 4 and Oracle Enterprise Linux 4 running Net-SNMP, when Hardware Management Agent sends v1 SNMP traps, the Enterprise field is populated with the following incorrect OID: 1.3.6.1.4.1.8072.3.2.3 (NET-SNMP-TC::solaris) instead of the correct OID: 1.3.6.1.4.1.42.2.175.103.2 (SUN-HW-TRAP-MIB::sunHwTraps). This is caused by CR 6473530 which should be fixed in the future by replacing SMA with Net-SNMP.

ILOM 3.0 and Windows Server 2003 R2 Extended Data Mode Issue

You may encounter issues with the ILOM 3.0 extended data mode when using the Hardware Management Agent on Windows Server 2003 R2. This is a known issue related to CR6888623.

Sun Blade X6450 with ILOM 2.0 and Windows Server 2003 Issue

When using ILOM 2.0 and Hardware Management Agent on Windows Server 2003 you may encounter issues with the SUN IPMI System Management Driver v2.1. This is a known issue related to CR6899339. You are recommended to upgrade to the latest firmware.

Windows Hardware Management Agent snmpwalk on a Sensor Group Issue

When using Hardware Management Agent on a Windows operating system, an SNMP walk of a sensor group returns an empty string if this group contains discrete sensors. This is a known issue related to CR6902930. A work around is an SNMP walk of the whole Sun-HW-Monitoring MIB.

Windows Hardware Management Agent SNMP Get Returns Empty String

When using Hardware Management Agent on a Windows operating system, an initial SNMP get returns empty strings for OIDs. Subsequent SNMP gets return the expected values. This is a known issue related to CR6901148.

Adaptec RAID Volumes not Reflected in ILOM CLI using Windows Storage Management Agent

RAID Volumes, consisting of concatenated logical drives (also known as RAID on RAID), are not supported in this version. This is related to CR6900378 and CR6904122.

Driver Errors in Windows Application Log

An event is generated during discovery because a specific disk is not in the expected format and Storage Management Agent can not get the disk's SCSI address. This is a valid error event and is related to CR66909870.

Ordering of Physical and Logical Disks Inconsistent Between Linux and Windows Storage Viewer

Running Storage Management Agent, the order of physical and logical disks under `/STORAGE` shows a different order when comparing the output from Windows and Linux based operating systems. This is related to CR6898097.

Storage Management Agent Windows 2003

When using Storage Management Agent on a server running Windows 2003 (non R2) and the Sun IPMI driver, the expected information may not be visible on the service processor. This is caused by an incorrect setting in the registry and is related to CR6915301. If it is not possible to upgrade the operating system and use the Microsoft IPMI driver, a work around is to manually change the `ipmi driver name` registry entry value from *ms* to *ism*.

For Windows Server 2003 32 bit change the value of the following registry entry:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Sun Microsystems\SSM\Sun Storage Management
Agent\ipmi driver name
```

For Windows Server 2003 64 bit change the value of the following registry entry:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Sun Microsystems\SSM\Sun Storage
Management Agent\ipmi driver name
```

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