Sun Server Management Agents 2.0 User's Guide

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Contents

Preface

The Sun Server Management documentation provides detailed information about 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

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.pack2

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.
- April 2010, updated to reflect changes in version 2.0.
- July 2010, updated to reflect changes in version 2.0.1.

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:

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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 x86 Server and server module's hardware. With the Hardware Management Agent and Hardware SNMP Plugins you can use SNMP to monitor the Sun x86 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 x86 servers and server modules.

The Hardware Management Agent and Hardware SNMP Plugins run on the host operating system of Sun x86 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 x86 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 x86 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 x86 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.
- Use the Sun Server Component Manager in unattended 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

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:

- Oracle 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 x86 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.

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 x86 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.

Sun SSM Component Manager Overview

Sun SSM Component Manager (Component Manager) is supplied as part of the Hardware Management Pack. Component Manager 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, then you can install components. Follow this procedure: "(Linux and Solaris) Using Component Manager" on page 14.

On Windows operating systems Component Manager is run from the download folder and copied to the install directory when at least one component is installed. Follow this procedure: "(Windows) Using Component Manager" on page 19.

Upgrading from Previous Versions

If you have installed a version of Hardware Management Pack prior to version 1.3 on your system, you must manually uninstall the earlier version before installing the latest version. If Component Manager detects these older versions of Hardware Management Pack during the install procedure it does not upgrade the system due to changes in the packaging of releases using Component Manager.

Management Agents 2.0 is not compatible with CLI Tools 1.0, available as part of Hardware Management Pack version 1.3. If Component Manager detects this conflict, you have to approve the upgrade of the CLI Tools component. CLI Tools 2.0 is not compatible with Management Agents 1.3 available as part of Hardware Management Pack version 1.3. When you are using Component Manager in interactive mode and a conflict is detected, you have to approve the upgrade of the Management Agents component. When you are using Component Manager in unattended mode and a conflict is detected, the Management Agents component is automatically upgraded.

In either case, check the supported server matrix at the following web site to ensure that your system is supported by the upgraded component:

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

(Linux and Solaris) 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 install components either interactively using a command-line interface or automatically using command-line switches, which enables unattended installs.

▼ (Linux and Solaris) How to Install Component Manager

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

1 **Open a terminal.**

2 **Navigate to the directory where you uncompressed the Hardware Management Pack package, and 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 use either the interactive mode or unattended mode. For more information see:

- "(Linux and Solaris) Using Component Manager in Interactive Mode" on page 14
- "(Linux and Solaris) Using Component Manager in Unattended Mode" on page 17

(Linux and Solaris) Using Component Manager in Interactive Mode

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

Note – On Windows operating systems command-line interactive mode is not available, use the Windows graphical installer. See "(Windows) Using Component Manager Command-line Interface" on page 22.

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

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

Choose options in the Component Manager by typing the letter shown between the [] characters.

Once you have installed the Component Manager, you can use either the interactive or unattended modes of the Component Manager to work with Hardware Management Pack components. For more information, see:

- "(Linux and Solaris) Using Component Manager in Interactive Mode" on page 14
- "(Linux and Solaris) Using Component Manager in Unattended Mode" on page 17

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

Before You Begin You must install the Component Manager before proceeding. You must carry out the following procedure as a user with root privileges.

Note – If you are upgrading from a previous version, see "Upgrading from Previous Versions" on page 13.

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.

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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) 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) 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 about both the already installed and available components.
-D	Print detailed information about 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.

Options and Actions	Functionality
-U *COMPONENT1:COMPONENT2*	Uninstall components. Component names are separated by a colon (:). If "ALL" is given as the component list, all available components are uninstalled.

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 you use the -C or -D options and are listed in square brackets.

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

When using the Component Manager in unattended mode, you can install components separately, or you can install all components. 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.

Note – If you are upgrading from a previous version, see "Upgrading from Previous Versions" on page 13.

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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) 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 about 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) Using Component Manager

When using the Component Manager on Windows operating systems you can choose between a command-line interface and a graphic user interface. The Component Manager graphic user interface provides an easy-to-use wizard to manage SSM components. The Component Manager command-line interface provides a text-based interface that can be used for unattended deployments.

This section provides the following information:

-
-

(Windows) Using the Component Manager Graphic Interface

The Component Manager graphic interface provides a graphical wizard for working with components. Component Manager provides a list of available components found in the Packages subdirectory, as well as any previously installed components. You can also control how Component Manager configures the services associated with components.

▼ (Windows) How to Install Using Component Manager Graphic Interface

When using the graphic interface Component Manager, components can be installed separately or all components can be installed . You can choose whether Component Manager automatically starts or restarts the services associated with components or not.

Note – If you are upgrading from a previous version, see "Upgrading from Previous Versions" on page 13.

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1 Navigate to the folder where you downloaded and unpacked the Hardware Management Pack and open the SOFTWARE folder.

2 Double-click sunssmcompmgr_gui.

The Component Manager graphic interface opens.

3 Click Deploy component from the local installation source.

Information about the components available to deploy opens.

On the right side of the screen there is a list of components available to deploy, as well as any components currently installed on the system. The left side of the screen provides information about the currently selected component.

4 From the Available components to deploy list, select the check box of one or more components you want to install on this server. When you have finished, click Next.

The list of pre-deployment tasks opens. Depending on the components you have chosen to install, the list of pre-deployment tasks might be empty or contain optional tasks Component Manager can carry out before you deploy the SSM components.

5 (Optional) If there are any tasks you want Component Manager to carry out before deploying SSM components, click one or more of the tasks from the list of pre-deployment tasks. Once you have chosen the pre-deployment tasks, click Next.

The list of post-deployment tasks opens. Depending on the components you have chosen to install, the list of post-deployment tasks may be empty or contain optional tasks Component Manager can carry out after deploying the SSM components.

6 (Optional) If there are any tasks you want Component Manager to carry out after deploying SSM components, click one or more of the tasks from the list of post-deployment tasks. Once you have chosen the post-deployment tasks, click Next.

The Deployment configuration summary opens.

7 Once you have reviewed the Deployment configuration summary, click Deploy to install the chosen SSM components.

Component Manager installs and configures the components you selected. Once the installation has finished, a log of the actions taken is displayed.

▼ (Windows) How to Uninstall using Component Manager Graphic Interface

When using the Component Manager graphic interface, you can uninstall components using a graphical wizard. You can also configure whether Component Manager automatically stops the services associated with components or not.

1 Navigate to the Control Panel and open Add or Remove Programs.

Tip – You can also open the Component Manager graphic interface by running the sunssmcompmgr_gui from the directory where you installed the Hardware Management Pack components.

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2 In the list of Currently installed programs, click the component you want to remove.

The clicked component becomes selected and the Change / Remove button appears.

3 Click Change / Remove.

The Component Manager graphical interface opens.

4 In the Component Manager graphical interface, click Remove deployed component.

The list of Available components to remove opens.

5 Select the component you want to remove, and then click Next.

The list of pre-removal tasks opens. Depending on the components you have chosen to install, the list of pre-removal tasks may be empty or contain optional tasks Component Manager can carry out before removing the SSM components.

6   **(Optional) If there are any tasks you want Component Manager to carry out before removing SSM components, click one or more of the tasks from the list of pre-removal tasks. Once you have chosen the pre-removal tasks, click Next.**

The list of post-removal tasks opens. Depending on the components you have chosen to install, the list of post-removal tasks may be empty or contain optional tasks Component Manager can carry out after removing the SSM components.

7   **(Optional) If there are any tasks you want Component Manager to carry out after removing SSM components, click one or more of the tasks from the list of post-removal tasks. Once you have chosen the post-removal tasks, click Next.**

The Removal configuration summary opens.

8   **Once you have reviewed the Removal configuration summary, click Remove to uninstall the chosen SSM components.**

Component Manager uninstalls and configures the components you selected. Once the uninstallation has finished, a log of the actions taken is displayed.

(Windows) Using Component Manager Command-line Interface

The command-line Component Manager on Windows operating systems provides the same functionality as the unattended mode available on Linux and Solaris operating systems. When passing options and actions to Component Manager at the command line, observe the following conventions:

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

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

Options and Actions	Functionality
/h	Display help about 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 about both the already installed and available components.

Options and Actions	Functionality
/D	Print detailed information about 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 uninstalled.

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 you use the /C or /D options.

▼ (Windows) How to Install Using Component Manager Command-line Interface

When using the command-line Component Manager, you can install components separately or you can install all components. 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.

Note – If you are upgrading from a previous version, see "Upgrading from Previous Versions" on page 13.

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1 Open the Command Prompt window.

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 Command Prompt window.

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) How to Uninstall Using the Component Manager Command-line Interface

When using the Component Manager command-line interface, you can uninstall components separately, or you can uninstall all components. Component Manager provides a list of currently installed components. You can also configure whether Component Manager automatically stops the services associated with components or not.

1   Open a Command Prompt window.

2   Navigate to the directory where you installed the Hardware Management Pack components.

3   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 about the currently installed components.

---

4   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 uninstall, 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) Hardware Management Agent Runtime Options" on page 27
- "Configuring your Host Operating System's SNMP" on page 28
- "(Solaris and Linux) Configuring Net-SNMP/SMA" on page 28
- "(Windows) Configuring SNMP" on page 30

Hardware Management Agent Configuration File

Once the Hardware Management Agent and Hardware SNMP Plugins are installed on the Sun x86 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/hwmgmtd.log`
Solaris	`/var/log/sun-ssm/hwmgmtd.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) 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 x86 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) Configuring Net-SNMP/SMA" on page 28
- Windows operating systems see "(Windows) Configuring SNMP" on page 30

(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 `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 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.**

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

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 x86 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 x86 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 x86 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 x86 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 37
- "sunHwMonProductGroup" on page 37
- "sunHwMonProductChassisGroup" on page 39
- "sunHwMonSPGroup" on page 39
- "sunHwMonInventoryTable" on page 40
- "sunHwMonSensorGroup" on page 41
- "sunHwMonIndicatorLocator" on page 43
- "Generating SNMP Traps" on page 44

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 x86 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 31or 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 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:
080020FFFFFFFFFFFFFF00144FEDE5E0
```

```
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:
080020FFFFFFFFFFFFFF001B24782F9C
```

```
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 47
- "Solaris Operating System Troubleshooting" on page 47
- "Linux Troubleshooting" on page 49

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.

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