Oracle Hardware Management Pack for Oracle Solaris 11.4 Installation Guide

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Oracle Hardware Management Pack for Oracle Solaris 11.4 Installation Guide,

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Using This Documentation

- **Overview** – Describes how to install the software
- **Audience** – Technicians, system administrators, and authorized service providers
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware
- Product Documentation Library
- Feedback
- Change History

Product Documentation Library

Documentation and resources for this product and related products are available at https://www.oracle.com/goto/ohmp/solarisdocs.

Feedback

Provide feedback about this documentation at https://www.oracle.com/goto/docfeedback.

Change History

The following changes have been made to the document.

- August 2018. Initial publication.
- July 2021. Removed mention of IPMIFlash. This tool is not included with Oracle Hardware Management Pack for Oracle Solaris 11.4. Updated *Installation Guide* to specify that command line tools interact directly with physical hardware and can not run in a virtual environment.
- May 2023. Minor documentation formating edits.

1

Oracle Hardware Management Pack Installation Overview

This guide provides instructions for installing components of Oracle Hardware Management Pack for Oracle Solaris 11.4.

Oracle Hardware Management Pack is an integrated component of the Oracle Solaris 11.4 operating system. Do not download and use other versions of Oracle Hardware Management Pack that are not specifically qualified for the Oracle Solaris 11.4.

If you have Oracle Solaris 11.1 or an earlier version of Oracle Solaris, continue to use Oracle Hardware Management Pack, available as a separate download from https://support.oracle.com.

Description	Link
Introduction to the Oracle Hardware Management Pack	Introduction to the Oracle Hardware Management Pack for Oracle Solaris
Install or uninstall Oracle Hardware Management Pack components	Installing or Uninstalling Oracle Hardware Management Pack Components

2

Introduction to the Oracle Hardware Management Pack for Oracle Solaris

This guide provides an overview of the Hardware Management Pack for Oracle Solaris components and how to install or remove them. For details on available Oracle Hardware Management Pack for Oracle Solaris components, see Available Hardware Management Pack Components.

The following table provides an overview of the Oracle Hardware Management Pack for Oracle Solaris components and how to use them with your Oracle servers.

Tool	Link	Description
Command line tools	*Oracle Server CLI Tools for Oracle Solaris 11.4 User's Guide*	Upgrade your server components' firmware. Configure BIOS, UEFI BIOS, RAID volumes and the Oracle Integrated Lights Out Manager (ILOM) service processors (SP) on your servers. View hardware configuration information and the status of your Oracle servers. Configure zoning on supported servers running the Oracle Solaris operating system (OS).
Management agent	*Oracle Server Management Agent for Oracle Solaris 11.4 User's Guide*	Provide information about storage and domains to Oracle ILOM. Enable in-band monitoring of your Oracle hardware at the OS level using the Simple Network Management Protocol (SNMP). You can use this information to integrate your Oracle servers into your data center management infrastructure. Configure an ILOM trap proxy that forwards SNMP traps from your Oracle ILOM SP over the Host-to-ILOM Interconnect to a destination of your choice.
IPMI	IPMItool	Access server SPs and perform management tasks using the IPMI protocol.

For more information on the Hardware Management Pack for Oracle Solaris features, see:

- About the Oracle Server Hardware Management Agent

- Oracle Server CLI Tools
- Host-to-ILOM Interconnect
- IPMItool

About the Oracle Server Hardware Management Agent

Oracle Hardware Management Pack for Oracle Solaris includes a Server Management Agent to help you monitor your Oracle servers.

Oracle Server Management Agent includes following components:

- Oracle Server Hardware Management Agent
- Oracle Server Hardware SNMP Plugins
- itpconfig and the Oracle ILOM Trap Proxy

Oracle Server Hardware Management Agent

The Oracle Server Hardware Management Agent (Hardware Management Agent), called `svc:/system/sp/management:default` (called hwmgmtd in Oracle Solaris versions earlier than 11.2), enables you to monitor and manage your server and server module hardware from the OS. By default, the Hardware Management Agent manages the storage poller and provides Oracle ILOM information about storage devices in the system including any changes to these devices.

The default Hardware Management Agent configuration for polling provides the optimal functionality in systems where SNMP monitoring is not used.

Where host-based SNMP monitoring is used the Hardware Management Agent and associated Oracle Server Hardware SNMP Plugins (Hardware SNMP Plugins) run on the host operating system of your Oracle servers. The Hardware Management Agent regularly polls the Oracle ILOM service processor (SP) for information about the current state of the server. Collected information is then made available by Hardware Management Agent over SNMP using the Hardware SNMP Plugins.

> **Note:**
>
> By default, the Hardware Management Agent SNMP monitoring function is disabled. To use it, the Oracle ILOM trap proxy must be configured using `itpconfig` and the Hardware Management Agent must be configured as described in Hardware Management Agent Configuration File in *Oracle Server Management Agent for Oracle Solaris 11.4 User's Guide*.

The Hardware Management Agent polls the SP for hardware information either over the Host-to-ILOM Interconnect, available on Oracle's latest servers, or keyboard controller-style (KCS) interface on previous generation servers. This in-band functionality enables you to use a single IP address (the host's IP) for monitoring your servers and blade server modules without having to connect the management port of the Oracle Integrated Lights Out Manager (ILOM) SP to the network.

In addition, the Hardware Management Agent maintains a separate log that contains information about the Hardware Management Agent status, which can be used for troubleshooting.

Oracle Server Hardware SNMP Plugins

The Oracle Server Hardware SNMP Plugins consists of OS-native SNMP plugins and hardware-specific Management Information Base (MIB) files which have been designed to enable you to monitor your Oracle servers effectively using SNMP.

> **Note:**
>
> By default, the Hardware Management Agent SNMP monitoring function is disabled. To use it, the Oracle ILOM trap proxy must be configured using `itpconfig` and the Hardware Management Agent must be configured as described in Hardware Management Agent Configuration File in *Oracle Server Management Agent for Oracle Solaris 11.4 User's Guide*.

The sunHwMonMIB describes the state of sensors and alarms on your servers and provides the following information:

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

The sunHwTrapMIB describes a set of traps for hardware events that can be generated by an Oracle server. It provides the following information:

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

The sunStorageMIB provides the following information about system storage:

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

itpconfig and the Oracle ILOM Trap Proxy

The `itpconfig` command-line interface (CLI) tool configures Oracle ILOM to forward SNMP traps to the host over the Host-to-ILOM Interconnect, available on servers with the necessary hardware. See your server documentation to check if your server supports Host-to-ILOM Interconnect. You can also use `itpconfig` to configure the Host-to-ILOM Interconnect between Oracle ILOM SP and the host.

The trap proxy notifies the Hardware Management Agent when Oracle ILOM has sent a trap. Instead of regularly polling Oracle ILOM for information, detection of a trap will initiate an update cycle to get the newest data from Oracle ILOM. By default, if no traps trigger a polling cycle then Oracle ILOM is polled by the Hardware Management Agent once per hour. For more about this feature, see Hardware Management Agent Configuration File in *Oracle Server Management Agent for Oracle Solaris 11.4 User's Guide*.

Oracle Server CLI Tools

Oracle Server CLI Tools (CLI Tools) are command-line interface tools that configure Oracle servers. CLI Tools consists of the following:

> **Note:**
>
> These commands interact directly with physical hardware and can not run in a virtual environment.

- `biosconfig` – enables you to configure your server's BIOS settings, found on the previous generation of servers.
- `fwupdate` – enables you to upgrade the firmware of your server components.
- `hwmgmtcli` – enables you to view hardware configuration information and the status of your Oracle servers.
- `ilomconfig` – enables you to configure Oracle ILOM Host Watchdogs, and can also configure Host-to-ILOM Interconnect settings.
- `nvmeadm` – enables you to view information on and configure NVM express controllers and their storage devices.
- `raidconfig` – enables you to configure RAID volumes on your servers.
- `ubiosconfig` – enables you to configure your server's UEFI BIOS, found on the latest Oracle servers.

Host-to-ILOM Interconnect

As of Oracle ILOM 3.0.12, a communication channel known as the Host-to-ILOM Interconnect was added to enable you to communicate locally with Oracle ILOM from the host operating system (OS) without the use of a network management connection (NET MGT) to the server. The Host-to-ILOM Interconnect is available on the latest

Oracle servers and is particularly useful when you want to perform these Oracle ILOM tasks locally:

- All server management functions in Oracle ILOM that you typically perform from the command line, web, or IPMI interfaces through the network management (NET MGT) connection on the server.
- All data transfers, such as firmware upgrades, to Oracle ILOM that you typically perform from the host over a Keyboard Controller Style (KCS) interface using the `fwupdate` tool. For these types of server management environments, the Host-to-ILOM Interconnect can provide a more reliable and potentially faster data transfer rate than traditional KCS interfaces.
- All future server monitoring and fault detection operations that you typically perform from the host operating system through the use of Oracle enabled software tools and agents installed on the server.

In Oracle Solaris operating system, the Host-to-ILOM Interconnect feature is automatically configured for you.

> **Note:**
>
> The Oracle Hardware Management Pack for Oracle Solaris documentation refers to this feature as Host-to-ILOM Interconnect. The Oracle ILOM interface refers to this feature as Local Host Interconnect or LAN-over-USB.

IPMItool

The IPMItool command-line utility is run on the host and enables you to manage and configure devices that support the IPMI protocol, such as Oracle ILOM. Oracle Hardware Management Pack for Oracle Solaris includes IPMItool for experts that are used to using this utility.

The Oracle Solaris version of IPMItool (beginning with version 1.8.15.0) includes a new secure interface called ORCLTLS. This supports running IPMItool commands using the TLS protocol and provides additional security over the LANPLUS protocol used in IPMI 2.0. This new interface added by Oracle is in addition to all of the standard interfaces included with IPMItool and is supported with versions of Oracle ILOM starting with 3.2.8.1.

For detailed information about using the secure IPMItool feature with Oracle ILOM, refer to *Oracle ILOM Protocol Management Reference for SNMP and IPMI* manual for your Oracle ILOM release (https://www.oracle.com/goto/ilom/docs).

For information about using the IPMItool utility included with Oracle Hardware Management Pack, refer to the command line help and the man page.

3

Installing or Uninstalling Oracle Hardware Management Pack Components

This section describes how to install and uninstall Hardware Management Pack components on an Oracle server manually using OS-specific commands.

The following information is included in this section:

- Installation, Upgrade and Usage Issues
- Available Hardware Management Pack Components
- How to Install Components on Oracle Solaris
- How to Uninstall Components on Oracle Solaris

Installation, Upgrade and Usage Issues

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

> **Note:**
>
> There might be additional installation issues in the . Review the Release Notes, along with the following issues, before installing Hardware Management Pack.

- **For Oracle Solaris 11.4 installations, many Oracle Hardware Management Pack components are pre-installed and ready to use.**

  To find out which Oracle Hardware Management Pack components are ready to use and which ones you need to install, see Available Hardware Management Pack Components.

- **When upgrading to Solaris 11.4 from a previous version of Oracle Solaris that had Oracle Hardware Management Pack installed.**

  – *If you have upgraded to Oracle Solaris OS 11.4 from a previous version that had Oracle Hardware Management Pack 2.2.7 or later installed*, Hardware Management Pack will be automatically upgraded (or downgraded) to the version that comes standard with your Oracle Solaris OS 11.4 package.

  – *If you have upgraded to Oracle Solaris OS 11.4 from a previous version that had Oracle Hardware Management Pack earlier than 2.2.7 installed*, you must reconfigure the Oracle Hardware Management Pack repository publisher so that the Solaris 11.4 publisher is used. Enter the command:

  ```
  pkg set-publisher --non-sticky mp-re
  ```

- **Installing and running Oracle Hardware Management Pack tools in Oracle Solaris zones.**

Oracle Hardware Management Pack components are meant to be installed and run from Solaris global zones. Although you can install component packages from non-global zones, running Hardware Management Pack tools from non-global zones generates a “Not supported” error message.

- **Running Oracle Hardware Management Pack tools in Oracle Solaris Logical Domains.**

  Only `fwupdate` and `raidconfig` can run on LDOM guest domains. Usage will only be meaningful if the LDOM has physical hardware (IO domain).

  All other tools generate a “Not supported” error message when run on LDOM guest domains.

- **Supported hardware for use with Oracle Hardware Management Pack tools.**

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

  https://www.oracle.com/goto/ohmp

- **Host-to-ILOM Interconnect feature might be left in a disabled state when Oracle Solaris Automated Installer is used (CR 18696723).**

  When using the Oracle Solaris Automated Installer (introduced with Oracle Solaris 11) to deploy software on a server, the server's Host-to-ILOM interconnect feature (required for many Oracle Hardware Management Pack features) might be left in a disabled state after the Automated Installer performs a reboot during installation. If this happens, a second server reboot after the installation has completed should fix the problem.

  To determine if your server was setup by the Automated Installer, enter the following command:

```
# netadm list | grep ncp
ncp         Automatic      online      <-- Automated Installer was used
ncp         DefaultFixed   disabled
```

Available Hardware Management Pack Components

Oracle Solaris OS 11.4 comes with many Oracle Hardware Management Pack tools preinstalled and ready for use. To find out what Oracle Hardware Management Pack packages are included in your installation of Oracle Solaris OS, use the `pkg list` command. For example:

```
pkg list | grep system/management
```

Packages with an "i" under IFO indicate that the package has already been installed. For example:

```
root@system1:~# pkg list | grep system/management
NAME (PUBLISHER)                  VERSION                    IFO
...
system/management/fwupdate        2.4.4.0-11.4.0.0.1.8.0     i--
system/management/fwupdate/emulex 6.3.12.2-11.4.0.0.1.8.0    i--
system/management/fwupdate/qlogic 1.7.3-11.4.0.0.1.8.0       i--
system/management/hmp-snmp        2.4.4.0-11.4.0.0.1.8.0     i--
system/management/hwmgmtcli       2.4.4.0-11.4.0.0.1.8.0     i--
```

```
system/management/hwmgmtd          2.4.4.0-11.4.0.0.1.8.0      i--
system/management/ilomconfig       2.4.4.0-11.4.0.0.1.8.0      i--
system/management/ipmitool         1.8.15.0-11.4.0.0.1.8.0     i--
...
system/management/raidconfig       2.4.4.0-11.4.0.0.1.8.0      i--
...
```

If your OS installation is missing a package you need, you can still install it from the Oracle Solaris repository.

Included Oracle Hardware Management Pack components vary depending on the Oracle Solaris OS server installation package used. The following table lists all available packages.

Package Name	Package Description
`system/management/biosconfig`	x86: Legacy BIOS configuration utility.
`system/management/hwmgmtd`	Oracle Server Hardware Management Agent daemon. Configured to autostart after installation.
`system/management/hmp-snmp`	Oracle Server Hardware SNMP plugins.
`system/management/ipmitool`	IPMItool utility used for controlling IPMI-enabled devices.
`system/library/hmp-libs`	Libraries required by Oracle Hardware Management Pack.
`system/management/raidconfig`	RAID configuration tool.
`system/management/fwupdate`	Firmware update tool.
`system/management/fwupdate/qlogic`	QLogic Fibre Channel Host Bus Adapter command line interface and library plugin for fwupdate.
`system/management/fwupdate/emulex`	Emulex Fibre Channel support, drivers and library plugin for fwupdate.
`system/management/ilomconfig`	Oracle ILOM configuration tool.
`system/management/hwmgmtcli`	Oracle Server CLI monitoring tool.
`system/management/ubiosconfig`	x86: UEFI BIOS configuration utility.
`system/storage/nvme-utilities`	NVM express device management tool.

How to Install Components on Oracle Solaris

- To install Hardware Management Pack components, you must be logged into your system with root privileges.
- If you are not using the public Oracle Solaris repository but instead have set up your own internal repository, ensure that you have set the publisher to point to your internal repro site. For example:

  ```
  # pkg set-publisher -p http://repository_URI
  ```

  Where *repository_URI* is the URI to your internal repository.
- If you are using the public Oracle Solaris repository (for example, http://pkg.oracle.com/solaris/release/en/index.shtml), and your company uses a proxy server, ensure that you have configured the proxy. For example:

  ```
  # export http_proxy=http://proxy-server:port-number
  ```

Where *proxy-server* is the address of your proxy server and *port-number* is the port number used for the proxy server.

1. Determine which Hardware Management Pack components to install. See Available Hardware Management Pack Components.
2. To install a package, use the following command:

   ```
   # pkg install package-name
   ```

   Where *package-name* is one or more of the packages (each separated by a space) listed in Available Hardware Management Pack Components. For example:

   ```
   root@system1:~# pkg install system/management/raidconfig
             Packages to install:  1
         Create boot environment: No
   Create backup boot environment: No
   DOWNLOAD                                  PKGS         FILES    XFER (MB)
   SPEED
   Completed                                  1/1           9/9 0.1/0.1  1.6M/s

   PHASE                                          ITEMS
   Installing new actions                         38/38
   Updating package state database                 Done
   Updating package cache                           0/0
   Updating image state                            Done
   Creating fast lookup database                   Done
   Updating package cache                           1/1
   root@system1:~#
   ```

How to Uninstall Components on Oracle Solaris

- To uninstall Hardware Management Pack components manually, you must be logged into your system with root privileges.

1. Determine which component(s) to uninstall. See Available Hardware Management Pack Components.

   > **Note:**
   >
   > The following package dependencies exist.
   >
   > - `hmp-libs` must be uninstalled at the same time or after all other Hardware Management packages have been uninstalled.
   > - `hmp-snmp` must be uninstalled at the same time or before `hwmgmtcli` is uninstalled.

2. To uninstall the packages, use the following command:

   ```
   # pkg uninstall package-name
   ```

   Where *package-name* is one of the packages listed in Available Hardware Management Pack Components. For example:

   ```
   root@system1:~# pkg uninstall system/management/raidconfig
               Packages to remove:  1
         Create boot environment: No
   Create backup boot environment: No
   PHASE                                          ITEMS
   ```

```
Removing old actions                             20/20
Updating package state database                   Done
Updating package cache                             1/1
Updating image state                              Done
Creating fast lookup database                     Done
Updating package cache                             1/1
root@system1:~#
```

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