

Oracle® Enterprise Manager Cloud Control Plug-In for Oracle Hardware User's Guide

Copyright © 2010, 2013, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT END USERS. Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Contents

- Using This Documentation5
 - Documentation and Feedback5
 - About This Documentation5
 - Change History6
- Overview of the Plug-In7
 - Features of the Plug-In7
- Installing and Uninstalling the Plug-In9
 - Deploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware9
 - Undeploying the Plug-In 16
- Monitoring Oracle Hardware System Targets 19
 - Oracle Hardware System Target Home Page 19
 - Metrics Available for Oracle Hardware System Targets 20
 - Understanding the Reports 25
 - Understanding Oracle Hardware System Alerts 27
- Index29**

Using This Documentation

This section describes product information, documentation and feedback, and a document change history.

- “Documentation and Feedback” on page 5
- “About This Documentation” on page 5
- “Change History” on page 6

Documentation and Feedback

The following documentation is available related to the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control.

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
Oracle Integrated Lights Out Manager 3.1	http://www.oracle.com/goto/ILOM/docs

Provide feedback on this documentation at:

<http://www.oracle.com/goto/docfeedback>.

About This Documentation

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

Change History

The following changes have been made to the documentation set.

- December 2011, initial publication for version 12.1.0.1.0.
- April 2012, updated for features in version 12.1.0.2.0 such as support for SPARC processor based servers and Oracle Solaris operating system; additional information on sudo.
- July 2012, updated for features in version 12.1.0.3.0 such as support for Microsoft Windows Server, changes to sudo configuration and Privilege Delegation set up; clarified UNIX specific information.
- June 2013, updated for features in version 12.1.0.4.0 such as the addition of open problem details.

Overview of the Plug-In

This section provides an overview of Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control and the features it provides. This documentation applies to Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control version 12.1.0.4.0.

- [“Features of the Plug-In” on page 7](#)

Features of the Plug-In

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control extends Oracle Enterprise Manager Cloud Control 12c with the ability to monitor the basic hardware configuration and status of your Oracle Sun servers.

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control provides the following functionality:

- general information about a hardware system such as server model, type and serial number; system firmware version; host primary MAC, IP and MAC address of the Oracle Integrated Lights Out Manager (ILOM) service processor
- a link to the Oracle ILOM web interface is provided if the Oracle ILOM service processor is connected to the network
- basic hardware inventory such as the maximum and actual number of installed fans, processors, DIMMs, power supplies, disks, flash storage modules and disk controllers; total size of installed memory and disks, number of logical volumes
- a user-centric view of hardware system health, both of the entire system and the functional subsystems, such as cooling, processors, memory, power, storage
- meaningful error messages if there are problems with the system or its components
- alerts raised when system or subsystem health states indicate problems
- current and historical readings of inlet and exhaust air temperature, also available as charts
- current and historical readings of system's power consumption, also available as charts
- a list of any open problem details (Oracle ILOM 3.1 and higher)

Installing and Uninstalling the Plug-In

This section explains how to install and uninstall the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware Cloud Control 12.1.0.4.0 (Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware) on your Oracle Enterprise Manager management server, as well as the servers you want to monitor.

- [“Deploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware” on page 9](#)
- [“Undeploying the Plug-In” on page 16](#)

Deploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware provides a set of tools that you deploy to the servers you want to monitor. These tools then supply Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware with the information required to monitor your servers in Oracle Enterprise Manager.

You must configure the servers you want to monitor before deploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware. Once you have prepared your servers for monitoring, you deploy Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware to your Oracle Enterprise Manager management server, and then to each server you want to monitor.

This section provides the following information:

- [“Management Server Prerequisites” on page 10](#)
- [“Monitored Server Prerequisites” on page 10](#)
- [“Preparing Servers for Monitoring” on page 10](#)
- [“Deploying the Plug-In to Enterprise Manager” on page 12](#)
- [“Deploying the Plug-in to your Servers” on page 14](#)

Management Server Prerequisites

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware has been tested with Oracle Enterprise Manager 12c Cloud Control (Oracle Enterprise Manager) version 12.1.0.2.0. For more information on Oracle Enterprise Manager 12c Cloud Control, see the following web page:

<http://www.oracle.com/technetwork/oem/enterprise-manager/index.html>.

Monitored Server Prerequisites

The servers you want to monitor using Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware must be supported and in addition the operating system running on the server must be supported. See this page for more information:

<http://www.oracle.com/goto/em-hw-plugin>

Preparing Servers for Monitoring

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware communicates with your target server's Oracle Integrated Lights Out Manager (ILOM) service processor for hardware inventory, health and configuration data. An IPMI interface is required between the host operating system and the server's service processor. By default this interface is configured on the following operating systems:

- Oracle Solaris 11
- Microsoft Windows Server 2008

On Linux based operating systems the IPMI interface might need to be configured manually. The following sections describe the configuration procedures you should follow on each server you want to monitor by enabling communication with the Oracle ILOM service processor.

Configuring the IPMI Interface (Linux)

For each server you want to monitor, an IPMI interface needs to be enabled in the running operating system. Processes that need to read from and write to the IPMI interface must run with administrator privileges. For security reasons, configuration of the `sudo` command is required on each server running Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware.

▼ Enabling the IPMI Interface

Before You Begin

You must have administrator privileges on the server to be able to follow this configuration procedure.

- **Enable the IPMI interface using the following command:**

```
# chkconfig --level 2345 ipmi on
```

Note – After making this change, you might need to start or restart the IPMI service.

Configuring Administrator Privileges (UNIX)

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware contains a utility called `hwmgmtcli` that is responsible for getting information from the Oracle ILOM service processor. Running the `hwmgmtcli` utility on the following operating systems requires configuration of `sudo`:

- Oracle Solaris
- Linux based operating systems

On servers running these operating systems, the Enterprise Management agent needs to be granted Administrator privileges so that the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware can successfully communicate with the Oracle ILOM service processor using the IPMI interface.



Caution – The following procedure impacts on the use of `sudo` on the server.

▼ Granting Administrator Privileges

- 1 Open the `sudoers` file for editing. The `sudoers` file is usually found at `/etc/sudoers`.

- 2 Add the following line to the `sudoers` file:

```
oracle ALL=(root) SETENV:AGENT_HOME/sbin/nmosudo *
oracle ALL=(root) SETENV:AGENT_HOME/core/AGENT_VERSION/perl/bin/perl
AGENT_HOME/core/AGENT_VERSION/../../plugins
/oracle.sun.ossb.agent.plugin_12.1.0.4.0/scripts/emx/oracle_hardware/collect.pl
*
```

where `AGENT_VERSION` is the version number of Oracle Enterprise Manager agent you are using, for example 12.1.0.4.0, and where `AGENT_HOME` is the root directory of the Oracle Enterprise Manager agent installation.

Note – If `sudo` is not correctly configured, or supplied with an incorrect password, collection of metrics might not function correctly.

Deploying the Plug-In to Enterprise Manager

Once you have configured your servers for monitoring, you download and then import Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware to your Oracle Enterprise Manager management server. Then you deploy Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware to the servers you want to monitor.

The latest version of Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware is available from:

<http://www.oracle.com/goto/em-hw-plugin>

The following procedures explain how to import and deploy Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware. For more information on this process, see your Oracle Enterprise Manager documentation for details on Importing an External Archive into Enterprise Manager.

Note – To upgrade from a previous version of Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware you must uninstall the previous version, which deletes all related targets. Then install the new version of Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware and add the targets.

▼ Importing the Plug-in to your Management Server

Before You Begin

- You must configure the servers you want to monitor before deploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware. See “[Preparing Servers for Monitoring](#)” on page 10.
- You must have administrator rights on your Oracle Enterprise Manager management server to deploy the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware.
- You must be able to access the `emcli` command, installed by default to the `bin` directory inside the Oracle Enterprise Manager install directory.

- 1 **Copy the file you have downloaded to your Oracle Enterprise Manager management server.**
- 2 **Use the `emcli` command to log in to the Oracle Enterprise Manager management server as the `sysman` user:**

```
emcli login -username="sysman"
```

When prompted, provide the password for the `sysman` user.

- 3 **Use the `emcli` command to import Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware:**

```
emcli import_update -file="path/plugin_version_oracle.sun.ossb_2000_0.opar"  
-omslocal
```

where *path* is the path to the file you saved in step 1, and *plug-in_version* is the version number of the plug-in, for example 12.1.0.4.0.

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware is imported to your Oracle Enterprise Manager management server.

▼ Deploying the Plug-in to your Oracle Enterprise Manager Management Server

- Before You Begin**
- You must import the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware before following this procedure. See [“Importing the Plug-in to your Management Server” on page 12](#).
- 1 Log in to the Oracle Enterprise Manager management server as an administrator. In the Setup menu, click Extensibility, and then click Plug-ins.**
 - 2 In the list of plug-ins, open the Servers, Storage and Network section, then click Oracle Hardware Plug-in.**
The Deploy On button becomes activated.
 - 3 From the Deploy On button's drop-down menu, click Management Server.**
The Deploy Plug-in on Management Servers dialog box opens.
 - 4 Click Add.**
The Search and Select: Targets window opens.
 - 5 Choose one of the following options:**
 - If the server you want to deploy to is listed in the Search and Select: Targets window, click the server's row and then click Select.
 - If the server you want to deploy to is not listed in the Search and Select: Targets window, use the search at the top of the window. When the server is listed, click the server's row and then click Select.
 - 6 Type the Repository SYS password and click Continue.**
Oracle Hardware Plug-in is installed to your Management Server.

Deploying the Plug-in to your Servers

Once you have deployed the Plug-in to your EM Management Server, you deploy the Plug-in to the EM Management Agent running on each target server. In addition, you must configure Privilege Delegation on each target server running the following UNIX based operating systems:

- Oracle Solaris
- Linux based operating systems

▼ Privilege Delegation Configuration (UNIX)

The following procedure is necessary only for target servers running UNIX based operating systems.

- 1 Log in to the Oracle Enterprise Manager management server as an administrator. Go to Setup, select Security and then Privilege Delegation.**
- 2 For each target you want to monitor, click on the pencil to edit the configuration.**
The target's configuration settings open.
- 3 Select the sudo radio button. Then set the Sudo Command field to:**
`path/sudo -E -u %RUNAS% %COMMAND%`
where *path* is the path to the sudo binary on the target.
- 4 Click the Update button.**
The changes to the target's configuration are saved.
- 5 Repeat this process for each target you want to monitor.**

▼ Deploying the Plug-in

Before You Begin ▪ You must deploy the Plug-in to your Oracle Enterprise Manager management server before following this procedure. See [“Deploying the Plug-in to your Oracle Enterprise Manager Management Server”](#) on page 13.

- 1 Log in to the Oracle Enterprise Manager management server as an administrator. In the Setup menu, click Extensibility, and then click Plug-ins.**
The Plug-in Updates screen opens.
- 2 From the Deploy On button's drop-down menu, click Management Agent.**
The Deploy Plug-in on Management Agent Window opens.

3 Click Add.

The Search and Select: Targets window opens.

4 Choose one of the following options:

- If the server you want to deploy to is listed in the Search and Select: Targets window, click the server's row and then click Select.
- If the server you want to deploy to is not listed in the Search and Select: Targets window, use the Target Name and On Host text boxes to search for a target server. When the server is listed, click the server's row and then click Select.

5 Click Continue.

Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware is deployed to the selected server.

6 Repeat this procedure for each of the servers you want to monitor in Oracle Enterprise Manager.**▼ Creating Oracle Hardware System Targets for Monitored Servers**

Once you have deployed Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware to your servers, you create Oracle Hardware System targets for the servers. Repeat the following procedure of creating Oracle Hardware System targets for every target server you want to monitor.

1 Log in to the Oracle Enterprise Manager management server as an administrator.**2 Click Setup, select Add Target, then click Add Targets Manually.****3 Under Add Targets Manually, select Add Non-Host Targets by Specifying Target Monitoring (the third option).****4 In the Target Type drop-down menu, select Oracle Hardware System.****5 In the Monitoring Agent section, click the magnifying glass.**

The Search and Select: Targets window opens.

6 Choose one of the following options:

- If the target server you want to monitor is listed in the Search and Select: Targets window, click the server's row and then click Select.

- If the target server you want to monitor is not listed in the Search and Select: Targets window, use the search at the top of the window. When the server is listed, click the server's row and then click Select.
- 7 With the target server you want to add listed in the Monitoring Agent text box, click Add Manually.
The Add Oracle Hardware System page opens.
- 8 Type the name and the monitoring credentials for the Enterprise Manager agent of the hardware system being added.
- 9 On a UNIX based operating system, from the Run Privilege drop-down menu, select Sudo. Type the user that has the appropriate privileges in the Run as field, for example root.

Note – If you encounter problems with Privilege Delegation Providers, see [“Privilege Delegation Configuration \(UNIX\)”](#) on page 14.

- 10 Click OK.

Undeploying the Plug-In

The process of undeploying Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware consists of reversing the steps taken during installation and removing the Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware from your Oracle Enterprise Manager management server and monitored servers.

▼ Removing Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware

- Before You Begin**
- You must have administrator rights on your Oracle Enterprise Manager management server.
 - You must undeploy Oracle Hardware Plug-in from all server management agents before undeploying from the Oracle Enterprise Manager management server.
- 1 Log in to the Oracle Enterprise Manager management server.
 - 2 In the Setup menu, select Extensibility and then click Plug-ins.
The Plug-ins page opens.
 - 3 In the list of plug-ins, click Oracle Hardware Plug-in.
The Oracle Hardware Plug-in row becomes selected.

4 From the Undeploy From drop-down menu, click Management Agent.

The Undeploy Plug-in From Management Agent page opens.

5 Click Add.

The Search and Select: Targets window opens.

6 Choose one of the following options:

- If the server you want to undeploy from is listed in the Search and Select: Targets window, click the server's row and then click Select.
- If the server you want to undeploy from monitor is not listed in the Search and Select: Targets window, use the search at the top of the window. When the server is listed, click the server's row and then click Select.

7 Click Select.

The selected target is listed in the Undeploy Plug-in From Management Agent page.

8 Click Continue, then Next and finally Undeploy.

The Oracle Hardware Plug-in is undeployed from the target server.

9 Repeat Steps 4 to 8 for each Management Agent server where you had Oracle Hardware Plug-in deployed.

10 Repeat Steps 4 to 8 for Oracle Enterprise Manager management server where you had Oracle Hardware Plug-in deployed.

Monitoring Oracle Hardware System Targets

Once you have installed Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware and created Oracle Hardware System targets for your servers, you can start to monitor the servers in Oracle Enterprise Manager. The information collected from your monitored servers is available as reports and you can also access the specific metric data for a target. In addition, any alerts generated by the plug—in are received by Oracle Enterprise Manager and displayed with a description.

Oracle Hardware System Target Home Page

The target home page of servers that are being monitored as Oracle Hardware System targets provide additional information about the monitored server. The following information is available:

- a time series chart of the actual power consumption over the period of last 12 hours
- a time series chart of the inlet air temperature over the period of last 12 hours
- a time series chart of the exhaust air temperature over the period of last 12 hours
- a list of active alerts for the selected Oracle Hardware System target
- a link to the server's Oracle ILOM service processor web user interface (only available if the Oracle ILOM service processor is connected to the network)

In addition, the Oracle Hardware System target home page provides a list of recently received alerts from the system and links to pages providing more information about the system.

▼ Viewing the Oracle Hardware System Target Home Page

- 1 Click Targets and then select Host.**
The list of currently monitored hosts opens.
- 2 In the Name column, click the host you want to view.**
The host page opens.
- 3 On the host page, click the targets link.**
The list of targets opens.

- 4 Click Hosts and then Related Targets.
- 5 From the list of targets, click the Oracle Hardware System target you want to view.
The Oracle Hardware System target page opens.

Metrics Available for Oracle Hardware System Targets

This section provides an overview of the metrics that are collected from each Oracle Hardware System target. You view the current values of the metrics by navigating to an Oracle Hardware System target's home page and selecting the All Metrics link in the Related Links section in the bottom part of the page. For more information on the Oracle Hardware System target's home page, see [“Viewing the Oracle Hardware System Target Home Page” on page 19](#).

The following sections explain the different metrics and how often they are collected.

- [“Response Metric” on page 20](#)
- [“System Information Metrics” on page 20](#)
- [“System Configuration Metrics” on page 21](#)
- [“System Health Metrics” on page 21](#)
- [“Meter Metrics” on page 22](#)
- [“System Inventory Metrics” on page 23](#)
- [“System Inventory Limits” on page 23](#)
- [“Open Problem Details” on page 24](#)

Response Metric

The Response metric is collected from an Oracle Hardware System target every 10 minutes. The metric column Status indicates if data can be obtained from the Oracle ILOM service processor or not. If there is a communication problem, the target availability is marked as Down by Oracle Enterprise Manager.

System Information Metrics

The System Information metrics are collected from an Oracle Hardware System target every 1 hour. The metrics provide an overview of the Oracle Hardware System target's hardware. The following table explains the different metrics.

TABLE 1 System Information Metrics Provided by an Oracle Hardware System Target

Metric Column	Description
Model	Server model identifier

TABLE 1 System Information Metrics Provided by an Oracle Hardware System Target *(Continued)*

Metric Column	Description
System Type	Rack Mount or Blade
Chassis Model	The chassis that the Blade is in. Only shown on relevant Blades.
Serial Number	System Serial Number
System Identifier	Custom server identifier as configured in the ILOM Service Processor
Processor Architecture	Architecture of installed CPUs, for example x86 64-bit
Processor Summary	Summary of installed CPUs models
System Firmware Version	Summary of installed system firmware, for example BIOS and ILOM

System Configuration Metrics

The System Configuration metrics are collected from an Oracle Hardware System target every 1 hours. The metrics provide an overview of the Oracle Hardware System target's configurable parameters. The following table explains the different metrics.

TABLE 2 Metrics Provided by an Oracle Hardware System Target

Metric Column	Description
ILOM Address	IP address of the ILOM Service Processor (if connected to network)
ILOM MAC Address	MAC address of the ILOM Service Processor
Chassis Address	IP address of the chassis, only relevant for Blade server modules
Host Primary MAC Address	MAC address of server's primary network interface
Permitted Power Consumption	Actual value of the server's maximum permitted power consumption as configured in the ILOM Service Processor

System Health Metrics

The System Health metrics are collected from an Oracle Hardware System target every 10 minutes. The metrics provide an overview of the Oracle Hardware System target's health and any problems that have been detected. The following table explains the different metrics.

TABLE 3 System Health Metrics Provided by an Oracle Hardware System Target

Metric Column	Description
Health	Overall health status of the entire system. Possible values: OK, Warning, Service Required
Health Details	Explanation of the current overall health status
Open Problems	Number of hardware-related problems diagnosed on the system
Cooling Health	Health status of the cooling subsystem (fan modules, fans, temperatures). Possible values: OK, Warning, Service Required
Cooling Health Details	Explanation of the current cooling health status
Processors Health	Health status of the CPUs. Possible values: OK, Warning, Service Required
Processors Health Details	Explanation of the current processors health status
Memory Health	Health status of the memory subsystem (DIMMs). Possible values: OK, Warning, Service Required
Memory Health Details	Explanation of the current memory health status
Power Health	Health status of the power subsystem (power supplies, input power). Possible values: OK, Warning, Service Required
Power Health Details	Explanation of the current power health status
Storage Health	Health status of the storage subsystem (disks, controllers, logical volumes, flash modules). Possible values: OK, Warning, Service Required
Storage Health Details	Explanation of the current storage health status

Meter Metrics

The Meter metrics are collected from an Oracle Hardware System target every 10 minutes. The metrics provide an overview of actual values detected on the Oracle Hardware System target. The following table explains the different metrics.

TABLE 4 Meter Metrics Provided by an Oracle Hardware System Target

Metric Column	Description
Actual Power Consumption	Actual value of the total server's power consumption in Watts

TABLE 4 Meter Metrics Provided by an Oracle Hardware System Target *(Continued)*

Metric Column	Description
Exhaust Air Temperature	Actual value of the server chassis exhaust air in degrees Celsius
Inlet Air Temperature	Actual value of the server chassis inlet air temperature in degrees Celsius

System Inventory Metrics

The System Inventory Metrics are collected from an Oracle Hardware System target every 4 hours. The metrics provide an overview of the hardware in the Oracle Hardware System target. The following table explains the different metrics.

TABLE 5 System Inventory Metrics Provided by an Oracle Hardware System Target

Metric Column	Description
Disk Controllers	The number of detected disk controllers.
Ethernet NICs	The number of detected Ethernet NICs.
Installed Add-on Cards	The number of detected add-on cards.
Installed Chassis Fans	The number of detected chassis fans.
Installed CPUs	The number of detected central processing units.
Installed DIMMs	The number of detected dual in-line memory modules.
Installed Disks	The number of detected disk drives.
Installed Disk Size	The size of the detected disk drives.
Installed FMODs	The number of detected flash modules.
Installed Memory	The size of the total detected memory.
Installed Power Supplies	The number of detected power supplies.
Installed Power Supply Fans	The number of detected power supply fans.
Logical Volumes	The number of logical volumes present.

System Inventory Limits

The System Inventory limits are collected from an Oracle Hardware System target every 24 hours. The limits provide an overview of the maximum hardware amounts that can be installed on the Oracle Hardware System target. The following table explains the different limits.

TABLE 6 System Inventory Limits Provided by an Oracle Hardware System Target

Metric Column	Description
Maximum Chassis Fans	Maximum number of server chassis fans that can be installed in the chassis
Maximum Power Supply Fans	Maximum number of power supply fans that can be installed in the chassis
Maximum CPUs	Maximum number of processors that can be installed in the chassis
Maximum DIMMs	Maximum number of memory modules that can be installed in the chassis
Maximum Power Supplies	Maximum number of power supplies that can be installed in the chassis
Maximum Disks	Maximum number of hard drives that can be installed in the chassis
Maximum FMODs	Maximum number of flash storage modules that can be installed in the chassis

Open Problem Details

The Open Problem Details are collected from an Oracle Hardware System target running Oracle ILOM 3.1 or above every 10 minutes. The Open Problems Details shows problems diagnosed by the service processor and provides information to help you identify the cause. The following table explains the different properties of an open problem.

TABLE 7 Open Problem Details Provided by an Oracle Hardware System Target

Metric Column	Description
Component	Hardware component where the problem was detected
Part number	Optional information about the part number
Probability	Probability that the component identified in the open problem is actually the source of the problem
Problem Description	Details about what problem has been detected
Reference Document	The link to a service document, if available
Subsystem	Subsystem that contains the component

Understanding the Reports

This section provides information on the two default reports provided by Oracle Enterprise Manager Cloud Control Plug-In for Oracle Hardware, the System Overview report and the Power Consumption and Cooling report. You navigate to the reports associated with a selected Oracle Hardware System target by clicking on the Reports tab in the top part of the target home page. The reports are also accessible on the global Enterprise Manager Reports tab. For more information on the Oracle Hardware System target's home page, see [“Viewing the Oracle Hardware System Target Home Page”](#) on page 19.

The section contains the following:

- [“System Overview Report”](#) on page 25
- [“Power Consumption and Cooling Report”](#) on page 26

System Overview Report

The System Overview report provides a central location for the information received from a monitored Oracle Hardware System target.

The System Overview report is divided into four parts, explained in the following sections:

- [“General Information Section”](#) on page 25
- [“Integrated Lights Out Manager Section”](#) on page 26
- [“Overall Status”](#) on page 26
- [“Open Problem Details”](#) on page 26
- [“Subsystems Status”](#) on page 26

General Information Section

The General Information section of the report provides a basic set of information about the selected Oracle Hardware System target. The properties displayed are as follows:

- Model
- Serial Number
- System Type
- System Firmware Version
- System Identifier
- Host Primary MAC address

For more information on the General Information section, see [“System Information Metrics”](#) on page 20.

Integrated Lights Out Manager Section

The Integrated Lights Out Manager section of the report provides information about the current settings of the Oracle ILOM service processor on the Oracle Hardware System target. The properties displayed are as follows:

- ILOM Address
- ILOM MAC Address

For more information on the Integrated Lights Out Manager section, see [“System Configuration Metrics” on page 21](#).

Overall Status

The Overall Status section of the report provides a summary of overall system health of a Oracle Hardware System target. The properties displayed are as follows:

- Health Status
- Health Details
- Open Problems

Health Status is a graphical representation of the states OK, Warning or Service Required. Health Details is a text representation of the states OK, Warning or Service Required.

For more information on the Overall Status section, see [“System Health Metrics” on page 21](#).

Open Problem Details

The Open Problem Details section provides a list of any open problems that the service processor detected. For more information, see [“Open Problem Details” on page 24](#).

Subsystems Status

The Subsystems Status section provides a tabular summary for each functional subsystem, that is cooling, processors, memory, power and storage. The table contains information about health, temperature and power consumption values as well as an inventory summary.

Power Consumption and Cooling Report

The Power Consumption and Cooling report provides two charts, a Power Consumption chart and a Cooling Air Temperature chart. By default, the charts display values for the period of past 12 hours.

If you want to display values for a longer or custom time interval, you need to navigate to the global Reports tab in Enterprise Manager and expand the Oracle Hardware System category. From there, you can select the Power Consumption and Cooling report, specify a target for

which you want to run the report and then set the time period for which you want to display data. For more information on the Reports tab, see the Oracle Enterprise Manager documentation.

The Power Consumption and Cooling report is divided into the following parts:

- [“Power Consumption Chart” on page 27](#)
- [“Cooling Air Temperature Chart” on page 27](#)

Power Consumption Chart

The Power Consumption chart displays hourly roll-ups of the actual power consumption of an Oracle Hardware System target, measured in Watts. In addition, the value of permitted power consumption is also displayed. The combined chart provides information about the power capacity utilization of the entire hardware system.

Note – On some system types, one or both values might not be available. For more information, see your hardware documentation

Cooling Air Temperature Chart

The Cooling Air Temperature chart displays hourly roll-ups of the inlet and exhaust air temperatures an Oracle Hardware System target, measured in degrees Celsius.

Note – On some system types, the value of exhaust air temperature might not be available. For more information, see your hardware documentation

Understanding Oracle Hardware System Alerts

This section provides an overview of the alerts that Oracle Hardware System targets can generate when they are being monitored in Oracle Enterprise Manager. The section contains the following:

- [“Default Oracle Hardware System Alerts” on page 27](#)
- [“User Definable Alerts” on page 28](#)

Default Oracle Hardware System Alerts

The default metrics that trigger an alert are as follows:

- Health
- Cooling Health

- Memory Health
- Power Health
- Processors Health
- Storage Health

For more information on these metrics, see [“Metrics Available for Oracle Hardware System Targets” on page 20](#).

Alerts are generated if any of the following conditions are met:

- metric has a value of Warning
- metric has a value of Service Required

A critical alert is also generated when the Health Status metric has a value of Down indicating that there is a problem communicating with the Oracle ILOM service processor on the Oracle Hardware System target.

User Definable Alerts

In addition to the default set of defined alerts, you can define additional alerts for the following rules:

- Actual Power Consumption is greater than a specified value
- Exhaust Air Temperature is greater than a specified value
- Inlet Air Temperature is greater than a specified value

You enable alerts for these metrics from the target home page of an Oracle Hardware System. For more information, see [“Oracle Hardware System Target Home Page” on page 19](#).

▼ Defining Alerts for an Oracle Hardware System Target

- 1 **Navigate to the Oracle Hardware System target home page.**
- 2 **In the Related Links section of the Oracle Hardware System target home page, select Metric and Collection Settings.**
- 3 **In the View combo box, select the All Metrics option.**
A list of all metrics enabled for alert generation opens.
- 4 **In the list of metrics enabled for alert generation, define the Warning and Critical thresholds for the metrics you want to generate an alert.**
- 5 **When you have defined the alerts you want this Oracle Hardware System target to generate, click OK to save your alert definition.**

Index

C

Cooling Air Temperature Chart, 27

D

Deploying the plug-in to Enterprise Manager, 12
deploying the Plug-in to your servers, 14
documentation links, 5

F

feedback, 5

H

Home page, 19
hwmgmtcli, 11

I

Integrated Lights Out Manager Section, 26
IPMI interface, 10

M

Meter Metrics, 22
Metrics, 20
Monitored server, Privileges, 11

O

Open Problem Details, 24
Oracle Enterprise Manager Cloud Control Plug-In for
Oracle Hardware, Deploying, 12
Oracle Hardware System target home page, 19
Overall Status, 26

P

Power Consumption and Cooling Report, 26
Power Consumption Chart, 27
Prerequisites
 Monitored server, 10
 Oracle Enterprise Manager server, 10
privilege delegation configuration, 14

R

Reports, 25
Response Metric, 20

S

Subsystem Status, 26
sudo, 11
Supported operating systems, 10
System Configuration Metrics, 21
System Health Metrics, 21
System Information Metrics, 20
System Inventory Limits, 23

System Inventory Metrics, 23
System Overview Report, 25

U

Uninstalling, 16