

Oracle Hardware Management Pack for Oracle Solaris 11.4 Security Guide



E79571-05
May 2023



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E79571-05

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1

Product and Application Security Overview

This section provides an overview of the Oracle Hardware Management Pack (HMP) for Oracle Solaris product and basic application security.

The following topics are covered:

- [About Oracle Hardware Management Pack for Oracle Solaris](#)
- [Basic Security Principles](#)
- [Oracle Hardware Management Pack Security Summary](#)

About Oracle Hardware Management Pack for Oracle Solaris

Oracle Hardware Management Pack for Oracle Solaris is available for many Oracle x86-based servers and some SPARC-based servers. Oracle Hardware Management Pack features two components: an SNMP monitoring agent and a family of command-line interface tools (CLI Tools) for managing your servers.

With the Hardware Management Agent SNMP Plugins, you can use SNMP to monitor Oracle servers and server modules in your data center with the advantage of not having to connect to two management points, the host and Oracle ILOM. This functionality enables you to use a single IP address (the host's IP) to monitor multiple servers and server modules.

Hardware Management Agent SNMP Plugins run on the host operating system of Oracle servers. The SNMP Plugins use the Oracle Hardware Storage Access Libraries to communicate with the service processor. Information about the current state of the server is fetched automatically by the Hardware Management Agent. For more information on the Hardware Management Agent, refer to the .

You can use the Oracle Server CLI Tools to configure Oracle servers. For a list of tools, refer to the .

See the Oracle Hardware Management Pack for Oracle Solaris documentation for more information about capabilities and usage.

- Oracle Hardware Management Pack for Oracle Solaris Documentation Library at: <https://www.oracle.com/goto/ohmp/solarisdocs>
- For general Oracle ILOM information refer to: <https://www.oracle.com/goto/ilom/docs>

Basic Security Principles

There are four basic security principles: access, authentication, authorization, and accounting.

- Access
 - Use physical and software controls to protect your hardware or data from intrusion.
 - For hardware, access limits usually mean physical access limits.

- For software, access limits usually mean both physical and virtual means.
- Firmware cannot be changed except through the Oracle update process.
- Authentication

Authentication provides a means to identify a person or entity. Set up all authentication features such as a password system in your platform operating systems to verify that users are who they say they are.

Authentication provides varying degrees of security through measures such as badges and passwords. For example, ensure that personnel use employee badges properly to enter a computer room.
- Authorization

Authorization defines what an authenticated user or entity can do. Use authorization to ensure company personnel can only work with hardware and software that they are trained and qualified to use.

For example, set up a system of read/write/execute permissions to control user access to commands, disk space, devices, and applications.
- Accounting

Customer IT personnel can use Oracle software and hardware features to monitor login activity and maintain hardware inventories.

 - Use system logs to monitor user logins. In particular, track system administrator and service accounts through system logs because these accounts can access powerful commands.
 - Periodically retire or archive log files when they exceed a reasonable size, in accordance with the customer company policy. Log files can become very large over time, so it is essential to maintain them.
 - Use component serial numbers to track system assets for inventory purposes. Oracle part numbers are electronically recorded on all cards, modules, and motherboards.

Oracle Hardware Management Pack Security Summary

Important security items to remember when configuring all system management tools are:

- *System management products can be used to obtain a bootable root environment.*

With a bootable root environment, you can obtain Oracle ILOM access, Oracle System Assistant access, and hard disk access.
- *System management products include powerful tools that require root access to run.*

With this level of access, it is possible to change hardware configuration and erase data.

2

Securing Oracle Hardware Management Pack

For Oracle Solaris, the most frequently used Oracle Hardware Management Pack components come preinstalled. To help ensure security, additional configuration might be required.

- [Keep Your Operating System Up to Date](#)
- [The Host-to-ILOM Interconnect Interface](#)
- [Support for Transport Layer Security \(TLS\) Encryption](#)
- [Remove Old Credentials File](#)
- [Choosing SNMP Security Settings](#)
- [Secure Login Passwords When Using ipmitool](#)

Keep Your Operating System Up to Date

It's very important to keep your Oracle Solaris operating system up-to-date with the latest security patches. Refer to the documents found in the "Updating and Recovering Oracle Solaris" section of the Oracle Solaris 11.4 Information Library at:

<https://docs.oracle.com/en/operating-systems/solaris/oracle-solaris/>

Also, keep your operating system secure as described in documents found in the "Securing the Oracle Solaris Operating System" section of the Oracle Solaris 11.4 Information Library.

The Host-to-ILOM Interconnect Interface

The Host-to-ILOM interconnect is an alternative to the standard, slower Keyboard Controller Style (KCS) internal interface for service processor communication. The Host-to-ILOM interconnect allows clients on the host operating system to communicate with the Oracle ILOM service processor over an internal high-speed interconnect. This interconnect is implemented by an internal Ethernet-over-USB connection, running an IP stack. Oracle ILOM and the host are given internal non-routable IP addresses for communication over this channel. For systems that support it, the Host-to-ILOM interconnect is enabled by default in Oracle Solaris.

From the host, you can connect and log in to Oracle ILOM over the Host-to-ILOM interconnect just as if the connection were coming over the network to the system's network management (NET MGT) port. All services or protocols exposed on the management network are made available over the Host-to-ILOM interconnect. As long as valid Oracle ILOM credentials are provided, the Host-to-ILOM interconnect can be used for both browser-based web access or CLI-based Secure Shell client access to Oracle ILOM.

Oracle recommends that your network support RFC 3927 and the ability to have link-local IPv4 addresses. Also, care should be taken to ensure that the operating system is not acting as a bridge or router. This ensures that management traffic between the host and Oracle ILOM over the Host-to-ILOM interconnect remains private.

Oracle recommends unique passwords be created for each user on each Oracle ILOM service processor so that a compromised password could not be used against other systems with Oracle ILOM.

For more information, see the [Host-to-ILOM Interconnect](#) in *Oracle Hardware Management Pack for Oracle Solaris 11.4 Installation Guide*.

Support for Transport Layer Security (TLS) Encryption

Oracle Solaris 11.4 includes support for TLS encryption for Oracle Hardware Management Pack command execution over the network.

- [Support for Using TLS Encryption with IPMI Over an Ethernet Network Connection](#)
- [Support for Using TLS Encryption With Oracle Hardware Management Pack Commands Over an Ethernet Network Connection](#)

Support for Using TLS Encryption with IPMI Over an Ethernet Network Connection

Support is available to use IPMI (including `ipmitool`) with TLS using the custom ORCLTLS interface if it is supported by the target Oracle ILOM service processor (SP). To use IPMI over TLS, the target Oracle ILOM SP must be version 3.2.8.1 or later. You can verify support by logging into the target Oracle ILOM SP using the web interface and checking the TLS Sessions setting under Administration > Management Access > IPMI.

If IPMI over TLS support is not available in the target Oracle ILOM SP, the connection will fall back to the LANPLUS interface (if enabled).

Support for Using TLS Encryption With Oracle Hardware Management Pack Commands Over an Ethernet Network Connection

When using Oracle Hardware Management Pack CLI commands that access the Oracle ILOM SP, two methods of access are supported: a local Host-to-ILOM interconnect connection or a remote Ethernet network connection.

- Command execution using local access over the Host-to-ILOM connection is the fastest local interface available. If a Host-to-ILOM connection is not available, the slower local KCS interface is used. Security for local access is built-in and self-contained.

Note:

For systems with an Oracle ILOM version earlier than 3.2.4, you must use the `-H` and `-U` options to target the local ILOM over the Host-to-ILOM connection. You will need to manually include credentials for any commands that accesses a service processor. If the `-H` and `-U` options are not used, the commands will default to the slower local KCS interface to access the local service processor.

- Command execution using remote Ethernet network access is encrypted using TLS by default. Oracle Hardware Management Pack commands that access an Oracle ILOM SP must present login credentials and also a trusted SSL client-side certificate for the target Oracle ILOM SP in order to validate the connection. This certificate checking feature is the default for a remote network connection when using the `fwupdate`, `ilomconfig` and `ubiosconfig` commands.

 **Note:**

Oracle recommends using SSL public key infrastructure on your network. Note that a `--no-cert-check` option is available to use with the `fwupdate`, `ilomconfig` and `ubiosconfig` commands in a safe network environment. However, use of this option makes the TLS connections vulnerable to man-in-the-middle attacks.

For more information on certificate checking, obtaining certificates and service processor access, refer to the "Service Processor Access" section in the for the `fwupdate`, `ilomconfig` and `ubiosconfig` commands.

Remove Old Credentials File

In Oracle Hardware Management Pack for Oracle Solaris versions earlier than Oracle Solaris 11.3, the `ilomconfig` tool allowed you to store a user name and password in an encrypted file that was root read-only. If this file was detected when `ilomconfig`, `fwupdate` or `ubiosconfig` tools were used to access Oracle ILOM, the cached credentials would have been used. This credential file feature is not supported with Oracle Hardware Management Pack for Oracle Solaris 11.4.

If you upgraded from an earlier version of Oracle Solaris to Oracle Solaris 11.4 and have previously saved a credentials file, use the `ilomconfig delete credential` command to delete this file.

See the for instructions on how to invoke commands that access a service processor.

Choosing SNMP Security Settings

Oracle Hardware Management Pack contains an SNMP Plugin module that extends the native SNMP agent in the host operating system to provide additional Oracle MIB capabilities. It is particularly important to note that the Oracle Hardware Management Pack does not itself contain an SNMP agent. For Oracle Solaris operating system, a module is added to the Solaris Management Agent.

Likewise, any security settings related to SNMP for the Oracle Hardware Management Pack SNMP Plugin are determined by the settings of the native SNMP agent or service, and not by the plugin. SNMP settings might include:

- **SNMPv1/v2c.** This version provides no encryption and uses community strings as a form of authentication. Community strings are sent in cleartext over the network and are usually shared across a group of individuals, rather than being private to an individual user.

- **SNMPv3.** This version uses encryption to provide a secure channel and has individual user names and passwords. SNMPv3 user passwords are localized so that they can be stored securely on management stations.

Oracle recommends that SNMPv3 be used if supported by the native SNMP agent. See your Oracle Solaris documentation for instructions on configuring net-snmp for SNMPv3.

Additionally, Oracle recommends that all SNMP traffic be isolated to a separate, secure management network.



Note:

SNMP functionality is disabled by default and must be enable and configured by the user as described in the .

Secure Login Passwords When Using ipmitool

The `ipmitool` command utility provides a broad range of management capabilities. When using `ipmitool` from the Oracle Solaris operating system to access a remote service processor, do not include the login password using the `-P` option in the command line or script as other Oracle Solaris users might be able to see it.

Instead, create a separate text file that contains only the password and use one of the following options when issuing a command or script that requires a login password:

| Option | Description |
|-------------------------------|--|
| <code>-f password_file</code> | <p>Specifies a file containing the remote Oracle ILOM service processor user account password. For example:</p> <pre># ipmitool -U root -f password.txt -H hostname bmc info</pre> <p>Where <i>hostname</i> is the host name or common name (when using a certificate) of the target service processor and <code>password.txt</code> is the text file containing the user account password.</p> <p>If the <i>password_file</i> argument for this option is absent or the file is empty, the password will default to NULL.</p> |
| <code>-f -</code> | <p>If a single hyphen character ("-") is used in place of <i>password_file</i>, the password can be read from either piped or redirected standard input. Example:</p> <pre># ipmitool -U root -f - -H hostname bmc info < password.txt</pre> <p>Where <i>hostname</i> is the host name or common name (when using a certificate) of the target service processor and <code>password.txt</code> is the text file containing the remote Oracle ILOM service processor user account password.</p> |

For additional information on using `ipmitool`, refer to the man page.

3

Installing or Uninstalling Oracle Hardware Management Pack Components

The following topics are covered:

- [Installing Components](#)
- [Uninstalling Components](#)

Installing Components

The Oracle Hardware Management Pack for Oracle Solaris consists of a set of tools that come preinstalled. Additional Oracle Hardware Management Pack component packages that do not come preinstalled can be installed using the Oracle Solaris Image Packaging System (IPS).

Only an administrator with root privileges can install Oracle Hardware Management Pack packages.

- Oracle Hardware Management Pack for Oracle Solaris Documentation Library: <https://www.oracle.com/goto/ohmp/solarisdocs>

Uninstalling Components

The Oracle Hardware Management Pack for Oracle Solaris packages can be uninstalled using the Oracle Solaris `pkg uninstall` command.

Note:

When uninstalling packages, if you have previously saved a host credentials cache file using the Oracle Hardware Management Pack `ilomconfig` command to facilitate accessing Oracle ILOM using the Host-to-ILOM interconnect, the file will not be deleted. In this case, before uninstalling Oracle Hardware Management Pack packages, run the `ilomconfig delete credential` command to delete this file.

- Oracle Hardware Management Pack for Oracle Solaris Documentation Library at: <https://www.oracle.com/goto/ohmp/solarisdocs>