# Oracle® ILOM Protocol Management Reference SNMP and IPMI Firmware Release 4.0.x

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# Contents

# Using This Documentation

- **Overview** – Provides instructions for managing remote Oracle hardware devices using the following supported management protocols: Simple Network Management Protocol (SNMP) and Intelligent Platform Management Interface (IPMI).
- **Audience** – This guide is intended for technicians, system administrators, and authorized Oracle service providers.
- **Required knowledge** – Users should have experience managing system hardware.

## Product Documentation Library

Documentation and resources for this product and related products are available at `http://docs.oracle.com/cd/E81115_01/index.html`.

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# SNMP Overview

| Description | Links |
| --- | --- |
| Learn about Oracle ILOM support for SNMP. | ■ "About Simple Network Management Protocol" on page 9 |
| Learn about management using SNMP. | ■ "SNMP Components" on page 10 |
| Learn about the Oracle ILOM SNMP Management Information Base (MIB) files. | ■ "Oracle ILOM SNMP MIBs" on page 11 |
| Learn about the command-line syntax used in this guide. | ■ "SNMP Command-Line Syntax Examples" on page 14 |

### Related Information

- "Modifying Default Management Access Configuration Properties" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*
- "Oracle ILOM Overview" in *Oracle ILOM User's Guide for System Monitoring and Diagnostics Firmware Release 4.0.x*

## About Simple Network Management Protocol

Oracle ILOM supports Simple Network Management Protocol (SNMP), which is used to exchange data about network activity. SNMP is an open, industry-standard protocol technology that enables the management of networks and devices, or nodes, that are connected to the network. When using SNMP, data travels between a managed device (node) and a management station with network access. A managed device can be any device that runs SNMP, such as a host, router, web server, or other server on the network. SNMP messages are sent over IP using the User Datagram Protocol (UDP). Any management application that supports SNMP can monitor your server.

Because SNMP is a protocol, not an application, you need an application to issue SNMP commands. Your SNMP management software might provide this functionality, or you can use

an open-source tool like Net-SNMP, which is available at http://net-snmp.sourceforge.net/.

For a more complete description of SNMP, see the five-part, introductory SNMP tutorial available at http://www.dpstele.com/layers/l2/snmp_l2_tut_part1.php.

Oracle ILOM supports SNMP versions 2c, and 3. Using SNMP v3 is strongly advised since SNMP v3 provides additional security, authentication, and privacy beyond SNMP v2c.

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**Note -** As of Oracle ILOM firmware version 4.0, support for all SNMP set operations and writeable SNMP MIBs have been removed. All permission properties for SNMP communities and users have also been removed. SNMP should be used for system monitoring and not for management. Snmp traps are still supported.

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**Note -** Oracle ILOM users reading this document are assumed to have a working knowledge of SNMP. SNMP client-side commands are used in this text as examples of using SNMP. Users who do not have a working knowledge of SNMP should complete the tutorial at http://net-snmp.sourceforge.net/wiki/index.php/Main_Page. This tutorial is more advanced than the introductory tutorial referred to above.

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# SNMP Components

SNMP functionality requires the following two components:

- **Network management station** – A *network management station* hosts management applications, which monitor and control managed nodes.
- **Managed node** – A *managed node* is a device such as a server, router, or hub that hosts SNMP management agents that are responsible for carrying out requests from management stations, such as a service processor (SP) running Oracle ILOM. Managed nodes can also provide unsolicited status information to a management station in the form of a trap.

SNMP is the protocol used to communicate management information between management stations and SNMP agents.

The SNMP agent is preinstalled on your Oracle server and runs on Oracle ILOM, so all SNMP management occurs through Oracle ILOM. To use this feature, your operating system must have an SNMP client application.

Both management stations and agents use SNMP messages to communicate. Management stations can send and receive information. Agents can respond to requests and send unsolicited messages in the form of traps. Management stations and agents use the following functions:

- Get
- GetNext
- GetResponse
- Trap

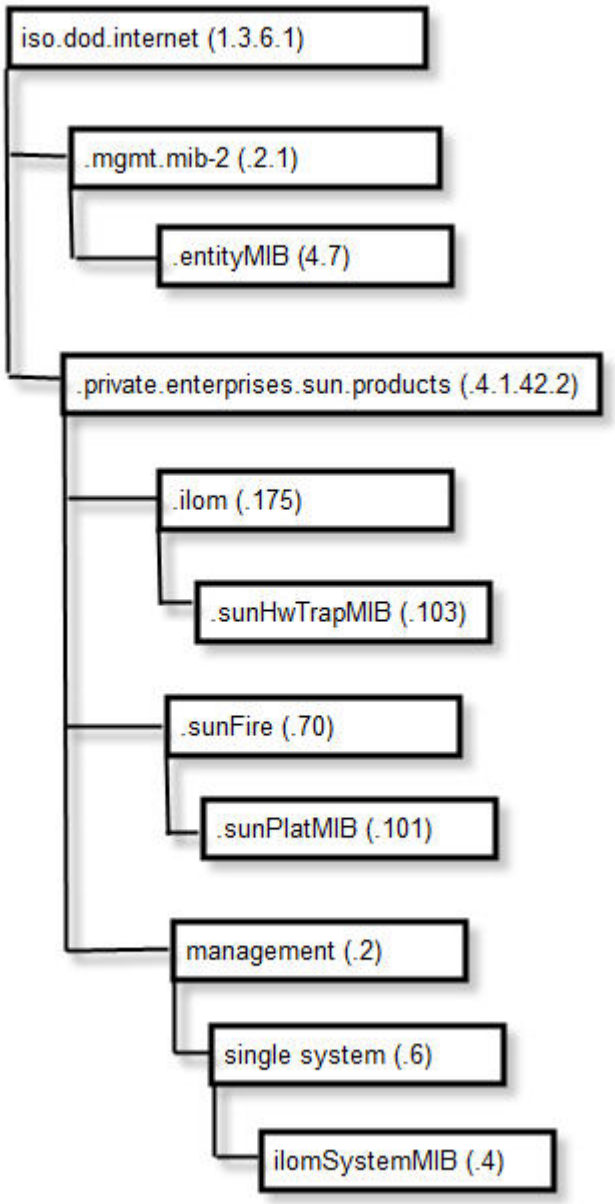
# Oracle ILOM SNMP MIBs

The base component of an SNMP implementation is the Management Information Base (MIB). A MIB is a text file that describes a managed node's available information. This tree-like, hierarchical system classifies information about resources in a network as a list of data objects, each with a unique identifier, or object ID. Thus, the MIB defines the data objects, or variables, that the SNMP agent can access. When a management station requests information from a managed node, the agent receives the request and retrieves the appropriate information from the MIBs. In Oracle ILOM, the MIB makes it possible to access the server's network configuration, status, and statistics.

SNMP MIBs are a part of the Oracle ILOM firmware. You can download MIBs directly from Oracle ILOM. For more information about MIBs, and instructions for downloading MIBs from Oracle ILOM, see "Before You Begin Download SNMP MIBs" on page 36.

The following figure shows the standard MIB hierarchy and the location of the Oracle ILOM MIB modules in that hierarchy. The Oracle ILOM MIB modules are described in the table that follows.

**FIGURE 1** Location of Oracle ILOM MIB Modules



The following table lists the Oracle ILOM MIB modules and the object ID for each MIB name.

**TABLE 1** Description of Oracle ILOM MIB Modules, Object ID, and MIB Name

| MIB Name | Description | MIB Object ID |
|---|---|---|
| ENTITY-MIB | The MIB module for representing multiple physical entities supported by a single SNMP agent.<br>**Note -** The entPhysicalTable is the only part of this MIB that is implemented. | 1.3.6.1.2.1.47 |
| SUN-Hw-TRAP-MIB | This MIB describes the hardware-related notifications and traps that can be generated by Oracle Sun server platforms.<br><br>For more information about managing SNMP traps in Oracle ILOM, see "Configuring SNMP Settings in Oracle ILOM" on page 17. | 1.3.6.1.4.1.42.2.175.103 |
| SUN-PLATFORM-MIB | This MIB provides extensions to the ENTITY-MIB (RFC 2737) where each entity modeled in the system is represented by means of extensions to the entPhysicalTable. | 1.3.6.1.4.1.42.2.70.101 |
| ilomSystemMIB | This MIB provides Oracle single system management logs and open problems data. | .1.3.6.1.4.1.42.2.2.6.4 |

Portions of the standard MIBs listed in the following table are implemented by Oracle ILOM.

**TABLE 2** Standard MIBs Implemented by Oracle ILOM

| MIB Name | Description | MIB Object ID |
|---|---|---|
| IF-MIB | This MIB module describes generic objects for network interface sub-layers. This MIB is an updated version of MIB-II's ifTable, and incorporates the extensions defined in RFC 1229. | 1.3.6.1.2.1.31 |
| IP-MIB | This MIB module is for managing IP and ICMP implementations, but excluding their management of IP routes. | 1.3.6.1.2.1.4. |
| SNMP-FRAMEWORK-MIB | This is the SNMP Management Architecture MIB. | 1.3.6.1.6.3.10 |
| SNMPv2-MIB | This is the MIB module for SNMP entities.<br>**Note -** Only the system and SNMP groups from this MIB module apply to Oracle ILOM. | 1.3.6.1.6.3.1 |
| TCP-MIB | This is the MIB module for managing TCP implementations. | 1.3.6.1.2.1.49 |
| UDP-MIB | This is the MIB module for managing UDP implementations. | 1.3.6.1.2.1.50 |

The following table lists MIBs that are used in support of the Oracle ILOM SNMP implementation.

**TABLE 3** MIBs Used in Support of the Oracle ILOM SNMP Implementation

| MIB Name | Description | MIB Object ID |
|---|---|---|
| HOST-RESOURCES-MIB | This MIB is for use in managing host systems. The MIB supports attributes common to all Internet hosts including, for example, both personal computers and systems that run variants of UNIX. | 1.3.6.1.2.1.25.1 |
| IANAifType-MIB | This MIB module defines the IANAifType Textual Convention, and thus the enumerated values of the ifType object defined in MIB-II's ifTable. | 1.3.6.1.2.1.30 |
| NOTIFICATION-LOG-MIB | This MIB module is used for logging SNMP notifications (traps). | 1.3.6.2.1.92.1.1.3 |
| SNMP-MPD-MIB | This MIB module is used for message processing and dispatching. | 1.3.6.1.6.3.11 |
| SNMPv2-TM | This MIB module is used for SNMP transport mappings. | 1.3.6.1.6.3.19 |
| SNMPv2-SMI | This MIB module contains definitions for the structure of management information, version 2. | 1.3.6.1.6 |

# SNMP Command-Line Syntax Examples

In some network environments, you are required to specify the SNMP version, community name, hostname, and default port when issuing SNMP commands. For example, to request the value of the object identifier (OID) `sysDescr.0` in an IPv4 environment, you might type the following:

```
%snmpget -v2c -c public 192.0.2.1:161 sysDescr.0
```

However, it is possible to configure your network environment such that most command-line arguments are not necessary. For example, for SNMP v1 or v2c, if you set default values for the SNMP version, community name, and default port, the following syntax is considered valid:

```
%snmpget SNMP_agent sysDescr.0
```

Throughout this guide, *SNMP_agent* refers to the hostname or IP address of the system you are querying.

---

**Note -** If you query a device using IPv6 addressing, you must use the following syntax: `udp6:[IPv6 address]` If the following message appears in response to the query: `getaddrinfo: node name or service name not known`, try adding `-YdefaultPort=<port_number>` to the SNMP command line arguments.

---

In addition, the examples in this guide omit most command-line arguments. To configure your network so that most command-line arguments are not necessary, see the following procedure:

- "Configure the SNMP Network Environment" on page 15

# Configure the SNMP Network Environment

1. **Log in the the Oracle ILOM command-line interface (CLI).**

   For instructions on logging in to Oracle ILOM, refer to the "Log In to the Oracle ILOM CLI" in *Oracle ILOM User's Guide for System Monitoring and Diagnostics Firmware Release 4.0.x*.

   ---

   **Note -** As of Oracle ILOM 4.0, read-write permissions for SNMP communities and v3 users is no longer supported.

   ---

2. **In Oracle ILOM, issue the create command to create an SNMP Community Name.**

   ```
   -> create /SP/services/snmp/communities/community name
   ```

3. **Issue the `set` command to enable SNMP access and specify the SNMP agent port address, for example:**

   ```
   -> set /SP/services/snmp servicestate=enabled v2c=enabled port=161
   ```

4. **Download the Oracle ILOM MIBs to the `$HOME/mibs` directory.**

   For instructions on downloading the Oracle ILOM MIBs, see "Downloading SNMP MIBs Using Oracle ILOM" on page 35.

5. **In the `$HOME/.snmp/snmp.conf` file in the `$HOME/mibs` directory, specify the following:**

   ```
   defversion          2c
   defcommunity        community_name
   defaultPort         161
   mibs                ALL
   mibdirs             +$HOME/mibs
   ```

6. **Test the new configuration by issuing the following command:**

   ```
   %snmp SNMP_agent sysName.0
   ```

   The command should produce similar output on your system:

   ```
   RFC1213-MIB::sysName.0 = STRING: "systemname"
   ```

# Configuring SNMP Settings in Oracle ILOM

| Description | Links |
| --- | --- |
| Learn about Oracle ILOM CLI procedures for managing SNMP access, user accounts, and SNMP trap alerts. | ■ "Managing SNMP User Accounts and SNMP Trap Alerts (CLI)" on page 17<br>■ "Managing SNMP User Accounts and SNMP Trap Alerts (Web)" on page 28 |
| Learn how to download SNMP MIBs directly from Oracle ILOM. | ■ "Downloading SNMP MIBs Using Oracle ILOM" on page 35 |

### Related Information

- "Modifying Default Management Access Configuration Properties" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*
- "Configuring Alert Notifications" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*

## Managing SNMP User Accounts and SNMP Trap Alerts (CLI)



### ▼ Set SNMP Access and Authorization

**Before You Begin**

- To modify SNMP properties in Oracle ILOM, you must have the Admin role (a) enabled.
- The SNMP `servicestate` property is, by default, shipped from the factory *enabled*.
- Oracle ILOM provides authentication properties for each of the following SNMP protocol versions: v2c, and v3.

- For SNMP v2c, Oracle ILOM provides the `public` and `private` targets within the `communities` target for managing user authentication.
- For SNMP v3, Oracle ILOM provides a `users` target for managing user authentication. The SNMPv3 `users` target is not shipped from the factory with pre-packaged values for users.

To set the SNMP service state, properties, follow these steps:

1. **Log in to the Oracle ILOM CLI.**

2. **To view the Oracle ILOM SNMP properties, type:**

   -> **`show /SP/services/snmp`**

   The following SNMP output appears.

```
-> show /SP/services/snmp
   /SP/services/snmp
   Targets:
     communities
     mibs
     users
   Properties:
     engineid = none
     port = 161
     servicestate = (enabled)
     v2c = disabled
     v3 = enabled
  Commands:
     cd
     set
     show
```

3. **Use the `set` command to change any of the SNMP properties, for example:**

   - To enable SNMP with read-only access, type:

     -> **`set /SP/services/snmp servicestate=enabled`**

   - To enable the SNMP protocol version (v2c or v3) property, type:

     -> **`set /SP/services/snmp v#=enabled`**

     where # is the SNMP protocol version you want to enable.

   For more information about SNMP user accounts and read and write access, see "Managing SNMP User Accounts and Communities" on page 19.

4. **Use the `create` command to create an SNMP v3 user account, for example:**

- To create a user account for authorization and provide read and write access, type:

  -> **create /SP/services/snmp/users/<***useraccountname***> authenticationpassword=***password***

For more information about SNMP user accounts and read and write access, see "Managing SNMP User Accounts and Communities" on page 19.

# Managing SNMP User Accounts and Communities



## Before You Begin SNMP User Accounts

Before performing the procedures in this section, ensure that the following requirements are met:

- To set SNMP user account properties in Oracle ILOM, you need the User Management (u) role enabled.
- Verify that the proper SNMP settings are enabled in Oracle ILOM. See "Set SNMP Access and Authorization" on page 17.

---

**Note -** The SNMP commands presented in this section are based on the Net-SNMP sample applications and, therefore, will work as presented only if you have Net-SNMP and the Net-SNMP sample applications installed.

---

## SNMP User Account Targets, Properties, and Values

You can access the SNMP user account targets, properties, and values under the `/SP/services/snmp` target. The following table identifies the targets, properties, and values that are valid for SNMP user accounts.

**TABLE 4** SNMP User Account Targets, Properties, and Values

| Target | Property | Value | Default |
|---|---|---|---|
| `/SP/services/snmp/users/` *username* | `authenticationprotocol` | MD5\|SHA | MD5 |
| | `authenticationpassword`† | <string> | (null string) |
| | `privacyprotocol` | none\|DES\|AES* | none |
| | `privacypassword`‡ | <string> | (null string) |
| `/SP/services/snmp` | `engineid = none` | <string> | (null string) |
| | `port = 161` | <integer> | 161 |
| | `servicestate = enabled` | enable\|disabled | enabled |
| | `v2c = disabled` | enabled\|disabled | disabled |
| | `v3 = disabled` | enabled\|disabled | enabled |

†You must provide an authentication password when you create or modify users (SNMP v3 only).

‡If the `privacyprotocol` property has a value other than none, then you must set a privacy password.

*AES (Advanced Encryption Standard) privacy protocol option is available for SNMPv 3 as of Oracle ILOM 3.0.16.

For example, to change `privacyprotocol` for user `a1` to `DES`, use the following syntax:

```
-> set /SP/services/snmp/users/al privacyprotocol=DES
privacypassword=password authenticationprotocol=SHA
authenticationpassword=password
```

Note that the changes would be invalid if the following syntax was specified:

```
-> set /SP/services/snmp/users/al privacyprotocol=DES
```

---

**Note -** You can change SNMP user permissions without resetting the `privacy` and `authentication` properties.

---

## SNMPv3 User Name and Password Requirements

| Property | Description |
|---|---|
| User Name | The SNMP user name can contain up to 32 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).Spaces not allowed. |
| Authentication Password | The Authentication Password is required when authentication protocol property is set to either MD5 or SHA.<br><br>Enter a case-sensitive Authentication password. The Authentication password can contain 8 to 12 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers). |
| Privacy Password | The Privacy Password is required when the privacy potocol property is set to DES or AES.<br><br>The Privacy password must contain exactly 8 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers) |

## ▼ View and Configure SNMP Community Properties

1. **To go to the `/SP/services/snmp` directory, type:**

```
-> cd /SP/services/snmp
```

2. **Within that directory, type the `show` command to view SNMP settings. The default settings are as follows:**

```
-> show
   /SP/services/snmp
   Targets:
     communities
     mibs
     users
   Properties:
     engineid = (none)
     port = 161
     servicestate = enabled
     v2c = disabled
     v3 = enabled
  Commands:
     cd
     set
     show
```

3. **To view the communities, type:**

-> **show /SP/services/snmp/communities**

For example:

```
-> show /SP/services/snmp/communities
/SP/services/snmp/communities
Targets:
  private
  public
Properties:
Commands:
  cd
  create
  delete
  show
```

4. **To create a community with read/write privileges, type:**

   -> **create /SP/services/snmp/communities/***communityname*

5. **To view the public communities, type:**

   -> **show /SP/services/snmp/communities/public**

   For example:

```
-> show /SP/services/snmp/communities/public
/SP/services/snmp/communities/public
Targets:
Properties:
Commands:
  cd
  show
```

## ▼ Add an SNMP v3 User Account

1. **Log in to the Oracle ILOM CLI.**

2. **To add an SNMP v3 read-only user account, type:**

   -> **create /SP/services/snmp/users/***username* **authenticationpassword=***Password* **privacypassword=***Password*

   *Where:*

   - *username* can contain up to 32 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).

- **`authenticationpassword=`** *Password* is required when creating or modifying an SNMP v3 user account. The Authentication password can contain 8 to 12 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).
- **`privacypassword=`** *Password* is only required when the Privacy Potocol property is set to DES or AES (default = None). The Privacy password must contain exactly 8 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers). To set the Privacy Protocol property, see "Set SNMP v3 User Account Privacy Protocol Value " on page 24

## ▼ Edit an SNMP v3 User Account

1. **Log in to the Oracle ILOM CLI.**

2. **To edit an SNMP v3 user account, type:**

   -> **`set /SP/services/snmp/users/`***username* **`authenticationpassword=`***password* **`privacypassword=`***Password*

   **Note -** When changing the parameters of SNMP users, you must provide a value for `authenticationpassword`, even if you are not changing the password.

   *Where:*

   - *username* can contain up to 32 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).
   - **`authenticationpassword=`** *Password* is required when creating or modifying an SNMP v3 user account. The Authentication password can contain 8 to 12 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).
   - **`privacypassword=`** *Password* is only required when the Privacy Protocol property is set to DES or AES (default = None). The Privacy password must contain exactly 8 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers). To set the Privacy Protocol property, see "Set SNMP v3 User Account Privacy Protocol Value " on page 24

## ▼ Delete an SNMP v3 User Account

1. **Log in to the Oracle ILOM CLI.**

2. **To delete an SNMP v3 user account, type:**

```
-> delete /SP/services/snmp/users/username
```

## Set SNMP v3 User Account Privacy Protocol Value

**Before You Begin**

- By default, the Privacy Protocol property is set to None.
- If the Privacy Protocol property is set to DES or AES, a privacy password must be provided when creating or modifying an SNMP v3 User Account. For further details about creating or editing an SNMP v3 User Account, see "Add an SNMP v3 User Account" on page 22 or "Edit an SNMP v3 User Account" on page 23.

1. **Log in to the Oracle ILOM CLI.**

2. **To modify the `privacyprotocol` property value assigned to an SNMP v3 user account, type:**

```
-> set /SP/services/snmp/users/username authenticationpassword=password
privacyprotocol=<DES|AES|None>
```

---

**Note -** When changing the parameters of SNMP users, you must provide a value for `authenticationpassword`, even if you are not changing the password.

---

---

**Note -** The SNMPv3 AES (Advanced Encryption Standard) option is available in Oracle ILOM as of 3.0.16.

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*Where:*

- *username* can contain up to 32 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).
- **`authenticationpassword=`***password* is required when creating or modifying an SNMP v3 user account. The Authentication password can contain 8 to 12 characters in length and include any combination of alphanumeric characters (uppercase letters, lowercase letters, and numbers).
- DES is the acronym for Digital Encryption Standard and AES is the acronym for Advanced Encryption Standard.

## Add or Edit an SNMP v1/v2c Community

1. **Log in to the Oracle ILOM CLI.**

2. **To add an SNMP v1/v2c community, type:**
   -> `create /SP/services/snmp/communities/`*community_name*

## ▼ Delete an SNMP v1/v2c Community

1. **Log in to the Oracle ILOM CLI.**

2. **To delete an SNMP v1/v2c community, type:**
   -> `delete /SP/services/snmp/communities/`*community_name*

# Managing SNMP Trap Alerts Using the Oracle ILOM


- "Configure SNMP Trap Rule Destinations and Properties " on page 25
- "CLI Commands for Managing Alert Rule Configurations" on page 27


## ▼ Configure SNMP Trap Rule Destinations and Properties

**Before You Begin**

- To create or edit alert rules in Oracle ILOM, you need the Admin (a) role enabled.
- For you to define an SNMP v3 trap alert, the SNMPv3 user name must be defined in Oracle ILOM. If the SNMP v3 user name is not defined in Oracle ILOM, the SNMP v3 user receiving the SNMP alert will not be able to decode the SNMPv3 alert message. For more information about defining SNMPv3 authorization and SNMP v3 users in Oracle ILOM, see "Managing SNMP User Accounts and SNMP Trap Alerts (CLI)" on page 17.
- Review "CLI Commands for Managing Alert Rule Configurations" on page 27.
- For additional information about configuring alert management settings in Oracle ILOM, refer to "Configuring Alert Notifications" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*.

To configure the destinations to which the SNMP traps are sent, follow these steps:

1. **Log in to the Oracle ILOM CLI.**

2. **To display the current settings of the alert rule, type the `show` command.**
   For example:

```
-> show /SP/alertmgmt/rules/1
/SP/alertmgmt/rules/1
   Targets:

   Properties:
      type = snmptrap
      level = disable
      destination = 0.0.0.0
      destination_port = 0
      community_or_username = public
      testrule = (Cannot show property)

   Commands:
      cd
      set
      show
```

---

**Note -** When you test an alert notification rule, Oracle ILOM will send a test from all configured SNMP traps. Oracle ILOM does not have the ability to filter SNMP traps by destination.

---

3. **To show the `/SP/alertmgmt/rules` directory, type:**

```
-> cd /SP/alertmgmt/rules
-> show
```

For example:

```
-> cd /SP/alertmgmt/rules
-> show
/SP/alertmgmt/rules
  Targets:
    1
    2
    .
    .
    .
    15
  Properties:

  Commands:
      cd
      show
```

Choose a rule (from targets 1 through 15) for which you would like to configure a destination for SNMP traps, and go to that directory.

For example:

```
-> cd 4
```

4. **To change the rule properties, within that rule directory, type the `set` command.**

   For example, to set a rule to send critical traps to a management client using SNMP v2c using a community name of “public”, enter:

   -> **`set type=snmptrap level=critical destination=`***IPaddress_of_snmp_management_station* **`destination_port=`***port* **`snmp_version=3c community_or_username=public`**

## CLI Commands for Managing Alert Rule Configurations

The following table describes the CLI commands that you use to manage alert rule configurations in the Oracle ILOM CLI.

**TABLE 5** CLI Commands for Managing Alert Rule Configurations

| CLI Command | Description |
|---|---|
| `show` | The `show` command enables you to display any level of the alert management command tree by specifying either the full or relative path. |
| `cd` | The `cd` command enables you to set the working directory. To set alert management as a working directory on a server SP, type the following command at the command prompt:<br>-> **`cd /SP/alertmgmt`** |
| `set` | The `set` command enables you to set values to properties from any place in the tree. You can specify either a full or relative path for the property depending on the location of the tree. For example:<br>■ For full paths, type the following at the command prompt:<br>-> **`set /SP/alertmgmt/rules/1 type=snmptrap`**<br>■ For relative path (tree location is `/SP/alertmgmt`), type the following command path at the command prompt:<br>-> **`set rules/1 type=snmptrap`**<br>■ For relative path (tree location is `/SP/alertmgmt/rules/1`), type the following command path at the command prompt:<br>-> **`set type=snmptrap`** |

# Managing SNMP User Accounts and SNMP Trap Alerts (Web)



## ▼ Set SNMP Management Access and Authorization

**Before You Begin**

- To modify SNMP properties in Oracle ILOM, you must have the Admin role (a) enabled.
- The SNMP `service` state is, by default, shipped from the factory *enabled*.
- Oracle ILOM provides authentication properties for each of the following SNMP protocol versions: v1, v2c, and v3.
  - For SNMP v2c, Oracle ILOM provides a `communities` property with values of *public* and *private* to manage user authentication. However, the property values for SNMP v2c communities are, by default, shipped from the factory *disabled*.
  - For SNMP v3, Oracle ILOM provides a `users` property to manage user authentication. The users property is, by default, shipped from the factory *enabled*. The SNMP v3 users property is not shipped from the factory with pre-packaged values for users.

To set the SNMP service state, properties:

1. **Log in to the Oracle ILOM web interface.**
2. **On the left navigation panel, click ILOM Administration.**
3. **Click Management Access > SNMP.**

   The SNMP Management page appears.
4. **To enable the SNMP port, click the State check box.**

   When State is disabled, the SNMP port is blocked, prohibiting all SNMP communication between Oracle ILOM and the network.
5. **In the Port text field, type the port number.**
6. **Leave the Engine ID field blank. This allows the default setting to be used.**

The engine ID is automatically set by the SNMP agent. While you can use this field to set the engine ID, you should leave this field blank. The engine ID uniquely identifies the SNMP engine and enables users to query the SNMP agent. Use this field to set the engine ID only if you are familiar with SNMP v3 security and how this setting is used.

7. **To enable SNMP v2c, or v3, click a Protocols check box.**

   SNMP v3 is enabled by default. You can enable or disable v2c and v3 protocol versions.

8. **Click Save.**

   At the bottom of the SNMP Management page, you can also add, edit, or delete SNMP communities or users.

# Managing SNMP User Accounts and Communities



## Before You Begin SNMP User Accounts

Before performing the procedures in this section, ensure that the following requirements are met:

- To set user account properties in Oracle ILOM, you need the User Management (`u`) role enabled.
- Verify that the proper SNMP settings are enabled in Oracle ILOM. For more details, see "Set SNMP Management Access and Authorization" on page 28.
- To execute the `snmpset` command, you need to use an SNMP v2c community or an SNMP v3 user account with read-write (rw) privileges.

## ▼ Add or Edit an SNMP v2c Community

To add or edit an SNMP v2c community, follow these steps:

1. **Log in to the Oracle ILOM web interface.**

2. **On the left navigation panel, click ILOM Administration.**

3. **Then click Management Access > SNMP.**

   Scroll to the bottom half of the SNMP Management page to find the SNMP Communities dialog box.

4. **To edit a community, do the following:**

   a. **Click the appropriate community radio button.**

   b. **Click Edit.**

      The Edit Community dialog box appears.

   c. **Update community properties, as needed.**

   d. **Click Save.**

5. **To add a community, do the following:**

   a. **Click Add.**

      The Add Community dialog box appears.

   b. **If you are adding a new community, type the name of the community in the Community Name field; otherwise, proceed to the next step.**

      The community name can contain up to 35 characters. It must start with an alphabetic character and cannot contain a space.

   c. **Click Save.**

## ▼ Delete an SNMP v2c Community

To delete an SNMP v2c community, follow these steps:

1. **Log in to the Oracle ILOM web interface.**

2. **On the left navigation panel, click ILOM Administration.**

3. **Then click Management Access > SNMP.**

   The SNMP Management page appears.

4. **Click the Communities link or scroll down to the communities list.**

5. **Click the radio button of the SNMP community to delete.**

6. **Click Delete.**

   A confirmation dialog box appears.

7. **Click OK to delete the SNMP community.**

## ▼ Add or Edit an SNMP v3 User Account

To add or edit an SNMP v3 user account, follow these steps:

---

**Note -** User accounts are not applicable to SNMP v2c because communities are used to control access.

---

1. **Log in to the Oracle ILOM web interface.**

2. **On the left navigation panel, click ILOM Administration.**

3. **Then click Management Access > SNMP.**

   The SNMP Management page appears.

4. **Click the Users link to expand the SNMP Settings page and display SNMP Users.**

5. **To add an SNMP user, click Add.**

   The Add User dialog box appears.

6. **To edit an SNMP user, do the following:**

   a. **Click the appropriate user radio button**

   b. **Click Edit.**

      The Edit SNMP User Information dialog box appears.

7. **If you are adding a user, type a user name in the User Name text field; otherwise proceed to the next step.**

   The user name can include up to 35 characters. It must start with an alphabetic character and cannot contain spaces.

8. **In the Authentication Protocol drop-down list, select either Message Digest 5 (MD5) or Secure Hash Algorithm (SHA).**

9. **In the Authentication Password text field, type a password.**

   The authentication password is case-sensitive and must contain 8 to 16 characters, with no colons or space characters.

10. **In the Confirm Password text field, retype the authentication password.**

11. **(Optional) To specify a privacy protocol, perform the following steps:**

    a. **In the Privacy Protocol list box, select DES (Digital Encryption Standard) or AES (Advanced Encryption Standard).**

    **Note -** The AES privacy protocol option is available only for SNMPv3 as of ILOM 3.0.16.

    b. **In the Privacy Password text box, type a password for the privacy algorithm specified in Step 12a.**

    The privacy password is case-sensitive and must contain 8 to 16 characters, with no colons or space characters.

    **Note -** The privacy password is only required if you selected DES or AES in Step 12a.

    c. **In the Confirm Password field, retype the privacy password to ensure that it matches the privacy password specified in Step 12b.**

12. **Click Save to apply the SNMP user account properties.**

## ▼ Delete an SNMP v3 User Account

To delete an SNMP v3 user account, follow these steps:

1. **Log in to the Oracle ILOM web interface.**

2. **On the left navigation panel, click ILOM Administration.**

3. **Then click Management Access > SNMP.**

   The SNMP Management page appears.

4. **Click the Users link or scroll down to the SNMP Users list.**

5. **Click the radio button of the SNMP user account to delete.**

6. **Click Delete under the SNMP User's List.**

   A confirmation dialog box opens.

7. **Click OK to delete the user account.**

## Manage SNMP Trap Alerts

**Before You Begin**

- To create or edit SNMP trap alert rules in Oracle ILOM, you need the Admin (a) role enabled.
- To define an SNMP v3 trap alert, you must define the SNMP v3 user name must be defined in Oracle ILOM. If the SNMP v3 user name is not defined in Oracle ILOM, the SNMP v3 user receiving the SNMP alert cannot decode the SNMP v3 alert message. For more information about defining SNMP v3 authorization and SNMP v3 users in Oracle ILOM, see "Managing SNMP User Accounts and SNMP Trap Alerts (Web)" on page 28.
- For additional information about configuring alert management settings in Oracle ILOM, refer to "Configuring Alert Notifications" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*.

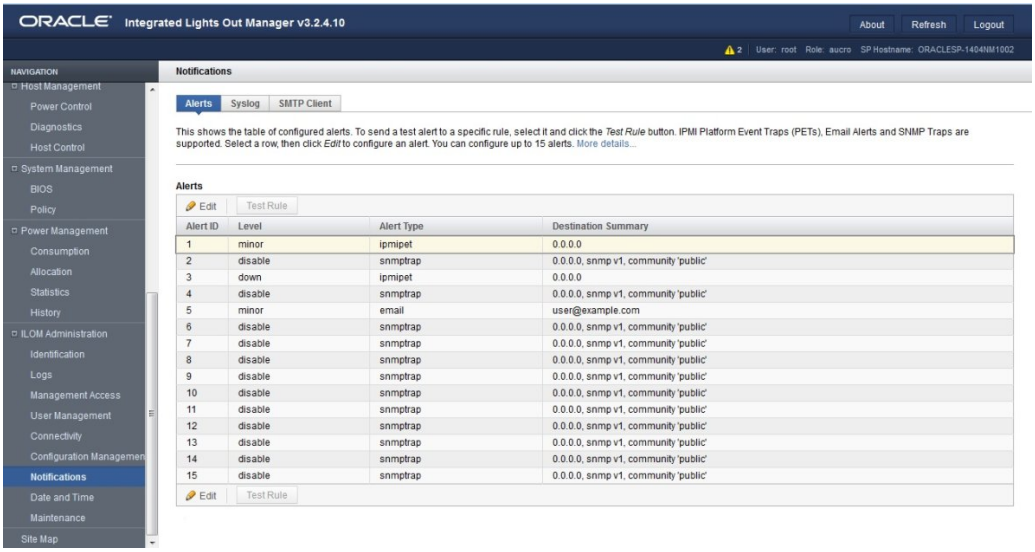
To configure SNMP Trap Alert properties, follow these steps:

1. **Log in to the Oracle ILOM web interface.**

2. **On the left navigation panel, click ILOM Administration.**

3. **Click Notifications > Alerts.**

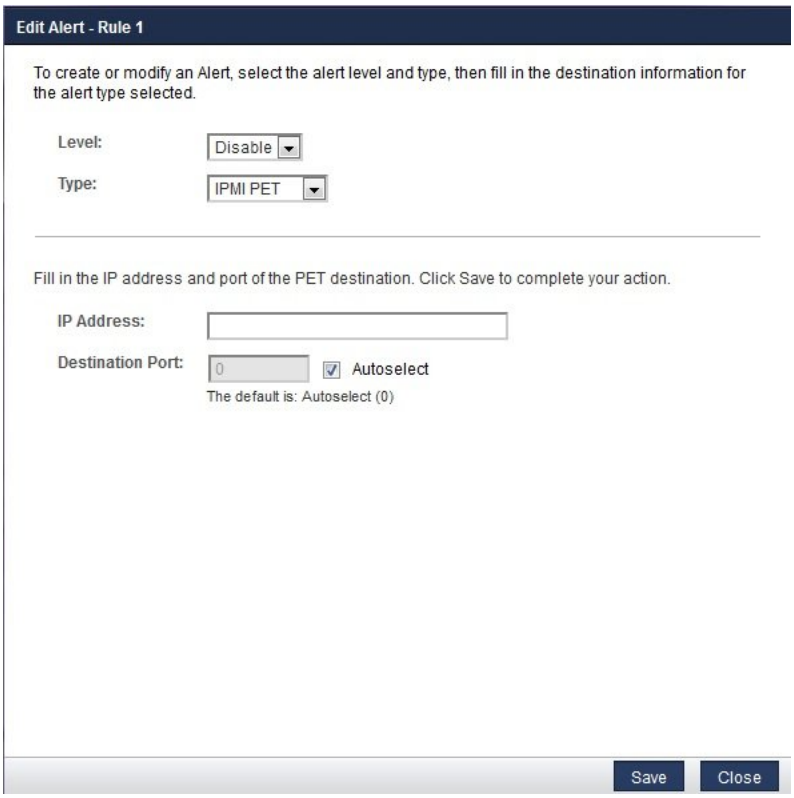
The Alert Settings page appears. This page shows a table of the alerts that you can configure. You can configure up to 15 alerts.




4. **To create or modify an alert, click the alert radio button.**

5. **Then click Edit.**

The Create or Modify Alert dialog appears.




6. **In the Level drop-down list, select the level of the alert.**
7. **In the Type drop-down list, select the alert type.**
8. **In the IP Address field, specify the alert destination IP address.**
9. **Click Save for your changes to take effect.**

# Downloading SNMP MIBs Using Oracle ILOM

- "Before You Begin Download SNMP MIBs" on page 36

- "Download SNMP MIBs (CLI)" on page 36
- "Download SNMP MIBs (Web)" on page 37


## Before You Begin Download SNMP MIBs

- The Reset and Host Control (`r`) role is required for you to download SNMP MIBs from Oracle ILOM.
- You must be using Oracle ILOM 3.0.4 or a later version of Oracle ILOM.

## ▼ Download SNMP MIBs (CLI)

1. **Log in to the Oracle ILOM CLI.**

2. **Use the `show` command to display the SNMP MIBs.**

   For example:

```
-> show /SP/services/snmp/mibs

/SP/services/snmp/mibs
    Targets:

    Properties:
        dump_uri = (Cannot show property)

    Commands:
        cd
        dump
        set
        show
```

3. **To download the files, type either of the following commands:**

   -> **`dump -destination`** *URI* **`/SP/services/snmp/mibs`**

   or

   -> **`set /SP/services/snmp/mibs dump_uri=`***URI*

   where *URI* specifies the target to which the files are downloaded.

   A zip file containing the MIBs are transferred to the destination server.

## ▼ Download SNMP MIBs (Web)

1. **Log in to the Oracle ILOM web interface.**
2. **On the left navigation panel, click ILOM Administration.**
3. **Click Management Access > SNMP.**

   The SNMP Management page appears.
4. **Click the MIBs jump link, or scroll down to the MIBs section.**
5. **Click Download, and then click Save and enter the destination to save the file.**

   A zip file containing the MIBs is transferred to the destination server.

# View Component Information and the Oracle ILOM Event Log (SNMP)

| Description | Links |
| --- | --- |
| Learn how to view component information. | ■ "Viewing Component Information" on page 39 |
| Learn how to view the log entries in the Oracle ILOM Event Log. | ■ "Viewing the Oracle ILOM Event Log" on page 40 |

### Related Information

- "Configuring Alert Notifications, Service Requests, or Remote Logging" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*

## ▼ Viewing Component Information

---

**Note -** You can use `get` commands to view component information. For a description of valid MIB objects for this procedure, see the table following this procedure.

---

1. **Log in to a host that has an SNMP tool and the Oracle ILOM MIBs installed. For example, type:**

   **`ssh`** *username@snmp_manager_ip_address*

   `Password:` *password*

2. **To view the firmware revision, type:**

   `%` **`snmpget`** *SNMP_agent* **`entPhysicalFirmwareRev.1`**

The following table describes the Component Information SNMP MIB objects.

| MIB Object | Description | Values | Type | Default |
|---|---|---|---|---|
| `entPhysical Name` | The textual name of the physical entity. | Size: 0 to 255 | String | Zero-length string |
| `entPhysical Descr` | A textual description of the physical entity. | Size: 0 to 255 | String | None |
| `entPhysical ContainedIn` | The value of entPhysicalIndex for the physical entity that *contains* this physical entity. A value of 0 indicates this physical entity is not contained in any other physical entity. | Range: 0 to 2147483647 | Integer | None |
| `entPhysical Class` | An indication of the general hardware type of the physical entity. | `other(1),`<br>`unknown(2),`<br>`chassis(3),`<br>`backplane(4),`<br>`container(5),`<br>`powerSupply(6),`<br>`fan(7),`<br>`sensor(8),`<br>`module(9),`<br>`port(10),`<br>`stack(11)` | Integer | None |
| `entPhysical FirmwareRev` | The vendor-specific firmware revision string for the physical entity. | Size: 0 to 255 | String | Zero-length string |

# Viewing the Oracle ILOM Event Log

**Note -** You can use the `get` command to view the Oracle ILOM event log and the `set` command to configure the event log. For a description of valid MIB objects for this procedure, see the table following this procedure.

1. **Log in to a host that has an SNMP tool and the Oracle ILOM MIBs installed. For example, type:**

   **`ssh`** *`username@snmp_manager_ip_address`*

`Password:` *password*

2. **To view the event log type for an event log with a record ID of 2, type:**

```
% snmpget SNMP_agent ilomSystemLogTable
```

The following table describes the Oracle ILOM Event Logs SNMP MIB objects.

| MIB Object | Description | Type |
|---|---|---|
| ilomSystemLogRecordID | Unsigned32 | The record number uniquely identifying the ilomSystem log entry. |
| ilomSystemLogTimestamp | DateAndTime | The date and time that the ilomSystem log entry was recorded. |
| ilomSystemLogSubsystem | SnmpAdminString | The subsystem the event pertains to. |
| ilomSystemLogComponent | SnmpAdminString | The component the event pertains to. |
| ilomSystemLogDescription | OCTET STRING | A textual description of the event. |

# Server Management Using IPMI

| Description | Links |
| --- | --- |
| Learn about using IPMItool to manage Oracle servers. | ■ "Intelligent Platform Management Interface (IPMI)" on page 43 |
| Learn how to configure the IPMI state and perform various management functions using the IPMItool. | ■ "Managing IPMI Properties in Oracle ILOM" on page 48<br>■ "Using IPMItool to Run Oracle ILOM CLI Commands" on page 50<br>■ "Performing System Management Tasks (IPMItool)" on page 54 |
| Learn about the IPMI commands. | ■ "IPMItool Options and Command Summary " on page 66 |

### Related Information

- "Modifying Default Management Access Configuration Properties" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*

## Intelligent Platform Management Interface (IPMI)



### About IPMI

Oracle ILOM supports the Intelligent Platform Management Interface (IPMI), which enables you to monitor and control your server, as well as to retrieve information about your server.

IPMI is an open, industry-standard interface that was designed for the management of server systems over a number of different types of networks. IPMI functionality includes field-replaceable unit (FRU) inventory reporting, system monitoring, logging of system events, system recovery (including system resets and power-on and power-off capabilities), and alerting.

The monitoring, logging, system recovery, and alerting functions available through IPMI provide access to the management functionality that is built into the platform hardware.

## IPMI Service State and Supported IPMI Sessions

By default, the IPMI service state in Oracle ILOM is enabled. The following IPMI sessions are supported as of Oracle ILOM firmware version 3.2.8:

- TLS Sessions — Enabled by default.

  **Note -** For increased security, always use the TLS sessions option.. For more details, see "IPMI TLS Service and Interface" on page 44.

- IPMI v2.0 Sessions — Enabled by default
- IPMI - v1.5 Sessions — Disabled by default (as of Oracle ILOM firmware 3.2.4).

The service processors (SPs) on your Oracle managed devices (servers, blade server modules, and so on) are IPMI compliant. You can access IPMI functionality through the command line using the `IPMItool` interface either in-band (using the host operating system running on the server) or out-of-band (using a remote system). Additionally, you can generate IPMI-specific traps from the Oracle ILOM web interface, or manage the SP IPMI functions from any external management solution that is IPMI compliant. For more information about the IPMItool utility, see "IPMItool" on page 46.

**Note -** For IPMI technical resources, including specifications, refer to the Intel and Sourceforge sites: `http://openipmi.sourceforge.net`

# IPMI TLS Service and Interface

IPMI TLS is an Oracle improvement to IPMI security which requires a special version of the ipmitool client that supports TLS sessions. The IPMItool command option to access the TLS interface is:

```
impitool -I orcltls
```

Note that in cases where the `-I` option is not specified, the IPMItool utility will negotiate to the most secure interface available (in the following order):

- TLS 1.2 (`orcltls` interface)
- TLS 1.1 (`orcltls` interface)
- TLS 1.0 (`orcltls` interface)
- IPMI 2.0 (`lanplus` interface)
- IPMI 1.5 (`lan` interface)

## TLS Session Feature Summary

| Feature | Description |
|---|---|
| Secure Communication Protocol Data Transmission | A secure TLS/TCP socket connection is used (over Ethernet and LAN over USB) to transmit and receive data between the IPMI client the server SP. |
| Negotiation of Highest Cipher Suite | IPMI/TLS client sessions negotiate to highest cipher suite supported on the server SP. |
| Authentication | Uses local SP authorization to validate user credentials and to set client session privileges.<br>**Note -** LDAP, Active Directory, and RADIUS user authorization is currently not supported as of firmware Oracle ILOM 3.2.8. |
| Audit Log of IPMI Login Events | The Audit Log captures all IPMI login events (successful and failed attempts). |
| SSL Certificate Validation | Automatically validates the SSL client certificate against a list of trusted certificates stored in the user specified directory (`ipmitool --cert-dir` option).<br><br>Note that when the IPMI TLS interface (`orcltls`) is unable to validate the client certificate, the user is prompted to cross-check the certificate's authentic fingerprint with the SSL certificate authentic fingerprints stored in the local SP directory (`/SP/services/https/ssl`). If a match is not found, the user should respond **`No`**. Otherwise, if a match is found, the user should respond **`Yes`** to proceed.<br><br>For information about how to disable the check option for certificate validation when the `orcltls` interface is specified see, "Disable Default TLS Behavior for SSL Certificate Check" on page 53.<br><br>For information about uploading and managing SSL certificates on the server SP, see "SSL Certificate and Private Key Configuration Properties for HTTPS Web |

| Feature | Description |
|---|---|
| | Server" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*. |

## TLS IPMItool Interface Download Requirement

Prior to executing Oracle ILOM commands from the TLS ipmitool interface, you must download the Oracle TLS components (OS compliant driver and the `orcltls` IPMItool interface) from Oracle Hardware Management Pack. For instance, to download the Oracle TLS components from Oracle Hardware Management Pack, follow this process:

1. On the managed device, download Oracle Hardware Management Pack (v2.4 or later for Linux or v4.0 or later for Oracle Solaris) from My Oracle Support.

   ---

   **Note -** The Oracle TLS components (OS compliant driver and the `orcltls` IPMItool interface) are not available for download from the Oracle Hardware Management Pack for Windows.

   ---

2. Launch the installer for the Hardware Management Component GUI by following the instructions in the *Oracle Hardware Management Pack Installation Guide*.

   The Oracle Hardware Management Pack documentation is available for download at: `http://docs.oracle.com/en/servers/management.html`
3. After launching the installer for the Hardware Management Component GUI, choose the Custom Install.
4. In the Custom Install Set menu, choose IPMItool.
5. Continue to follow the instructions in the *Oracle Hardware Management Pack Installation Guide* to complete the installation.

# IPMItool

IPMItool is an open-source simple command-line interface (CLI) utility for managing and configuring IPMI-enabled devices. The utility can be used to manage the IPMI functions of a local or remote system with a kernel device driver or over a LAN interface. Versions of the IPMItool utility for all Oracle ILOM supported IPMI interfaces are available for download from the Oracle Hardware Management Pack.

You can do the following with IPMItool:

- Read the sensor data record (SDR) repository.

- Print sensor values.
- Display the contents of the system event log (SEL).
- Print field-replaceable unit (FRU) inventory information.
- Read and set LAN configuration parameters.
- Perform remote chassis power control.

IPMItool features command-line help, which can be accessed by typing `ipmitool help` at the command-line prompt.

IPMItool supports a feature that enables you to enter Oracle ILOMCLI commands just as though you were using the ILOM CLI directly. CLI commands can be scripted, and then the script can be run on multiple service processor (SP) instances. For additional information, see "Using IPMItool to Run Oracle ILOM CLI Commands" on page 50.

# IPMI Alerts

Oracle ILOM supports alerts in the form of IPMI Platform Event Trap (PET) alerts. Alerts provide advance warning of possible system failures. Alert configuration is available from the SP on your server. IPMI PET alerts are supported on Oracle server SPs; however, IPMI PET alerts are not supported on chassis monitoring modules (CMMs). For more information about IPMI alerts, refer to "Configuring Alert Notifications" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*.

# IPMI Administrator and Operator Roles

The *IPMI Administrator role* maps to these user roles in Oracle ILOM: `aucro`. The *IPMI Operator role* maps to these user roles in Oracle ILOM: `cro`. A brief explanation of these Oracle ILOM roles appears in the following table.

**TABLE 6** IPMI Administrator and Operator Roles in Oracle ILOM

| IPMI Role | Enabled ILOM Role Privileges | Description |
|---|---|---|
| Administrator | ■ Admin (`a`)<br>■ User Management (`u`)<br>■ Console (`c`)<br>■ Reset and Host Console (`r`)<br>■ Read-Only (`o`) | These user roles enable read and write privileges to these management features in Oracle ILOM: system management configuration properties, user account properties, remote console management properties, remote power management properties, and reset and host control management properties. |

| IPMI Role | Enabled ILOM Role Privileges | Description |
|---|---|---|
| Operator | ■ Console (c)<br>■ Reset and Host Console (r)<br>■ Read-Only (o) | These user roles enable read and write privileges to these management features in Oracle ILOM: remote console management properties, remote power management properties, and reset and host control management properties. |

**Note -** The Read-Only role provides read access to system management configuration properties and user management properties.

For more information about Oracle ILOM roles and privileges, refer to "Managing User Credentials" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*.

# Managing IPMI Properties in Oracle ILOM


- "Set the IPMI State and Session Properties (CLI)" on page 48
- "Set the IPMI State and Session Properties (Web)" on page 49


## ▼ Set the IPMI State and Session Properties (CLI)

**Before You Begin**

- The IPMI state property in Oracle ILOM is enabled by default.
- As of Oracle ILOM firmware v3.2.8, the following IPMI properties are shipped enabled: **Service State**, **TLS Sessions**, and **v2.0 Sessions**. The session property for v1.5 is shipped disabled.
- Admin (a) role privileges are required to change the IPMI Service State or Session properties in Oracle ILOM.

  **Note -** The TLS Session property is always enabled and cannot be modified.

- If FIPS mode is enabled in Oracle ILOM, the IPMI v1.5 session property cannot be enabled. For additional information about FIPS mode, see "Operating Oracle ILOM in FIPS Compliance Mode" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*

Follow these steps to set the IPMI state and sessions properties using the Oracle ILOM CLI:

1. **Log in to the Oracle ILOM CLI using an account with admin (a) role privileges.**

2. **To set the IPMI state property, issue the following command:**

   -> **set /SP/services/ipmi state=[***enabled***|***disabled***]**

   *Where*: [*enabled*|*disabled*], type `enabled` to enable the `ipmi state` property, or type `disabled` to disable the `ipmi state` property.

   **Note -** If the IPMI Service State is disabled, system management information using the IPMItool utility is not accessible.

3. **To set the IPMI session properties, issue the following command:**

   -> **set /SP/services/ipmi [v2_0_sessions=***enabled***|***disabled***][v1_5_sessions=***enabled***|***disabled***]**

   **Note -** TLS sessions (`tls_sessions`) are enabled by default. To disable TLS sessions, you must disable the IPMI State property.

   *Where*:

   - [`v2_0_sessions=`*enabled*|*disabled*] applies only to the IPMI v2.0 session property. Type: `v_2_0_sessions=enabled` to enable the IPMI v2.0 sessions; **or** Type: `v_2_0_sessions=disabled` to disable the IPMI v2.0 sessions.
   - [`v1_5_sessions=`*enabled*|*disabled*] applies only to the IPMI v1.5 session property. Type: `v_1_5_sessions=enabled` to enable the IPMI v1.5 sessions; **or** Type: `v_1_5_sessions=disabled` to disable the IPMI v1.5 sessions.

     **Note -** For higher level of security, the properties for `v_2_0_sessions` and `v_1_5_sessions` should always be disabled.

     **Note -** If FIBS mode is enabled, the IPMI `v_1_5_sessions` property cannot be enabled.

## ▼ Set the IPMI State and Session Properties (Web)

**Before You Begin**

- The IPMI state property in Oracle ILOM is enabled by default.

- As of Oracle ILOM firmware 3.2.8, IPMI Session properties are enabled for TLS and IPMI v2.0. The property for IPMI v1.5 Sessions is disabled.
- Admin (a) role privileges are required to change the IPMI state or session properties in Oracle ILOM.
- If FIPS mode is enabled in Oracle ILOM, the IPMI v1.5 session property cannot be enabled. For additional information about FIPS mode, see "Operating Oracle ILOM in FIPS Compliance Mode" in *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*

Follow these steps to set the IPMI state and sessions properties using the Oracle ILOM web interface:

1. **Log in to the Oracle ILOM web interface using an account with admin (a) role privileges.**
2. **Click ILOM Administration → Management Access > IPMI.**

   The IPMI page appears.
3. **In the IPMI page, enable or disable the IPMI State check box and the applicable sessions property check boxes for TLS, IPMI v2.0 and IPMI v1.5.**

---

**Note -** If the IPMI Service State property is disabled, system management information using the IPMItool utility is not accessible.

---

**Note -** For a higher level of security, the checkboxes for IPMI 1.5 sessions and IPM 2.0 sessions should be disabled.

---

**Note -** If FIBS mode is enabled, the IPMI v1.5 session property cannot be enabled. For more details about FIPS mode, click the Details link on the Management Access > FIPS page.

---

# Using IPMItool to Run Oracle ILOM CLI Commands

The IPMItool CLI is a convenient alternative method to executing Oracle ILOM CLI commands. It enables you to enter commands just as if you were using the Oracle ILOM CLI directly. Most Oracle ILOM CLI commands are supported.


- "IPMItool and Oracle ILOM Requirements" on page 51
- "Access the Oracle ILOM CLI From IPMItool" on page 52

- "Disable Default TLS Behavior for SSL Certificate Check" on page 53
- "Scripting Oracle ILOM CLI Commands With IPMItool" on page 53


# IPMItool and Oracle ILOM Requirements

Prior to using the IPMItool to execute Oracle ILOM commands, review these requirements:

- Use the latest IPMItool that is available from the Oracle Hardware Management Pack.

---

**Note -** IPMItool users can check the version number of the IPMItool by specifying the **-V** option (**ipmitool -v**).

---

- To use the IPMI TLS interface, IPMItool users must use IPMItool v1.8.15.0 or later that is available for download from Oracle Hardware Management Pack for Linux (as of v2.4 and later) and Oracle Hardware Management Pack for Solaris (as of v4.0 and later).

---

**Note -** To access the IPMI TLS interface, IPMItool users can either specify the `-I orcltls` option or not specify an option and the IPMItool will automatically detect the most secure interface available.

---

- Ensure that you have the proper user roles assigned in Oracle ILOM when using the IPMItool utility to execute Oracle ILOM commands. For more information, see "IPMI Administrator and Operator Roles" on page 47.
- Unless otherwise noted, commands described in this section accept options and other arguments according to the following syntax:

  **ipmitool** [*option(s*] **-I** [*orcltls*|*lanplus*] **-H** [*hostserveraddress*] [*hostserveroptions*]

  **[***command issued***]**
  **[***system output***]**

  *Where*:

  - [*option(s)*] can include: **-c [***cipher suite level***]** |**-h** (to display help)**|-v** (to display verbose output) |**-V** (to display version number)
  - **-I** identifies the selected IPMI interface such as **-I orcltls** ( IPMI TLS interface) | **-I lanplus** (IPMI v2.0 interface).

---

**Note -** If an IPMI interface is not specified, the IPMItool defaults to the most secure IPMI interface supported on the host server.

---

- **-H** [*hostserveraddress*] identifies the remote server SP hostname or IP address. The [*hostserveroption(s)*] must always specify: **-U [***username***] -P [***password***]**. The [*hostserveroption(s)*] can also include optional options such as **-p [***portnumber***]** | **-R [***retries count***]**

---

**Note -** Required host options for all IPMI interfaces include: **-H [***hostserveraddress***] -U [***username***]** and **-P [***password***]**.

---

- [*command issued*] can either identify a dedicated ILOM IPMItool command or a Sunoem ILOM command.
- [*system output*] displays the command results.

For more details, see the "IPMItool Options and Command Summary " on page 66.

---

**Note -** If you encounter command-syntax problems with your particular operating system, you can use the IPMItool `-h` option to determine which parameters can be passed with the IPMItool command on your operating system. Also refer to the IPMItool man page by typing: **man ipmitool**.

---

## ▼ Access the Oracle ILOM CLI From IPMItool

1. **To enable the Oracle ILOM CLI using IPMItool, type:**

   $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password* **sunoem cli**

   The Oracle ILOM CLI prompt appears as follows:

   ```
   Connected. Use ^D to exit.
   ->
   ```

2. **To use the Oracle ILOM CLI, type CLI commands.**

   For information on how to script Oracle ILOM CLI commands, see "Scripting Oracle ILOM CLI Commands With IPMItool" on page 53.

## Disable Default TLS Behavior for SSL Certificate Check

- **To disable the validation of the SSL certificate when accessing the IPMI TLS interface (orcltls), issue the `--no-check-certificate` command. For example:**

```
$ ipmitool -I orcltls  -H SP_hostname_or_IPaddress -U username -P password --no-cert-check
```

---

**Note -** For security reasons, the SSL certificate is automatically verified upon accessing the IPMI TLS interface (`orcltls`). For additional information about the SSL certificate check, see "IPMI TLS Service and Interface" on page 44.

---

## Scripting Oracle ILOM CLI Commands With IPMItool

A key benefit of using Oracle ILOM CLI from IPMItool is that the CLI commands can be scripted and then the script can be run on multiple SP instances. Scripting is possible because the CLI commands can be included on the IPMItool command line where each argument on the command line is treated as a separate Oracle ILOM CLI command. Command separation is archived by including quotation marks at the beginning and end of each Oracle ILOM CLI command.

The following example shows how to include two CLI commands on the IPMItool command line. In the example, notice that each command begins and ends with quotation marks.

```
# ipmitool -H SP_hostname_or_IPaddress -U username -P password sunoem cli
"show /SP/services" "show /SP/logs"
Connected. Use ^D to exit.
-> show /SP/services
 /SP/services
   Targets:
      http
      https
      ipmi
      kvms
      servicetag
      snmp
      ssh
      sso
```

```
    Properties:

    Commands:
      cd
      show

-> show /SP/logs
 /SP/logs
   Targets:
      audit
      event

   Properties:

   Commands:
      cd
      show
-> Session closed
 Disconnected
```

# Performing System Management Tasks (IPMItool)



## ▼ Display Sensor List

- **To view a list of sensors on a managed device, type:**

$ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

```
sdr list
```

---

**Note -** The IPMI TLS interface ( `orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*.

---

The output might look like the following:

```
/SYS/T_AMB       | 24 degrees C       | ok
/RFM0/FAN1_SPEED | 7110 RPM          | ok
/RFM0/FAN2_SPEED | 5880 RPM          | ok
/RFM1/FAN1_SPEED | 5880 RPM          | ok
/RFM1/FAN2_SPEED | 6360 RPM          | ok
/RFM2/FAN1_SPEED | 5610 RPM          | ok
/RFM2/FAN2_SPEED | 6510 RPM          | ok
/RFM3/FAN1_SPEED | 6000 RPM          | ok
/RFM3/FAN2_SPEED | 7110 RPM          | ok
/RFM4/FAN1_SPEED | 6360 RPM          | ok
/RFM4/FAN2_SPEED | 5610 RPM          | ok
/RFM5/FAN1_SPEED | 5640 RPM          | ok
/RFM5/FAN2_SPEED | 6510 RPM          | ok
/RFM6/FAN1_SPEED | 6180 RPM          | ok
/RFM6/FAN2_SPEED | 6000 RPM          | ok
/RFM7/FAN1_SPEED | 6330 RPM          | ok
/RFM7/FAN2_SPEED | 6330 RPM          | ok
/RFM8/FAN1_SPEED | 6510 RPM          | ok
/RFM8/FAN2_SPEED | 5610 RPM          | ok
```

---

**Note -** The sensor output shown in the preceding example was shortened. The actual output will depend on the hardware platform.

---

## ▼ View Single Sensor Details

- **To view details about a single sensor on a managed device, type:**

  **`sensor get`** *`/target/sensor_name`*

  For example, to view sensor details about the system temperature (`/SYS/T_AMB`), you would type:

$ **ipmitool -I [***orcltls*|*lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

**sensor get /SYS/T_AMB**

---

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*

---

The output might look like the following:

```
Locating sensor record...
Sensor ID              : /SYS/T_AMB (0x8)
 Entity ID             : 41.0
 Sensor Type (Analog)  : Temperature
 Sensor Reading        : 24 (+/- 0) degrees C
 Status                : ok
 Lower Non-Recoverable : 0.000
 Lower Critical        : 4.000
 Lower Non-Critical    : 10.000
 Upper Non-Critical    : 35.000
 Upper Critical        : 40.000
 Upper Non-Recoverable : 45.000
 Assertions Enabled    : lnc- lcr- lnr- unc+ ucr+ unr+
 Deassertions Enabled  : lnc- lcr- lnr- unc+ ucr+ unr+
```

## ▼ View and Interpret Presence Sensor Type Values

### Before You Begin

- The IPMItool supports the output of a `States Asserted` field for each presence sensor type record. This `States Asserted` field can appear in the IPMItool output as either:
  - `States Asserted = Entity Presence`

    When the `States Asserted = Entity Presence` field appears, the sensor output for a hardware component can show one of three valid values: `Present(=1)`, `Absent(=2)`, `Disabled(=4)`.
  - `States Asserted = Availability State`

When the `States Asserted = Availability State` field appears, the sensor output for a hardware component can show one of two valid values: `Device Absent(=1)` and `Device Present(=2)`.

---

**Note -** Oracle ILOM supports the output of both `States Asserted` fields. However, some Oracle hardware platforms might support both or one of the possible `States Asserted` fields (`Entity Presence` or `Availability State`).

---

For additional information about how to interpret values presented for IPMI presence sensor types, refer to Section 42 - Sensor and Event Code Tables in the IPMI 2.0 Specifications. Understanding all of Section 42 is critical in understanding how to interpret a sensor value.

To view and interpret IPMItool present sensor type values, follow these steps:

1. **To view the actual sensor reading for hardware components, use the IPMItool `sdr list` command.**

   For example, after issuing the `sdr list` command the following presence sensor type readings appear for PCIe hardware components.

```
PCIE_CC/PRSNT    | 0x02              | ok
PCIE0/F20/PRSNT  | 0x01              | ok
```

2. **To determine the `States Asserted` field value for a presence sensor type, use the IPMItool `sensor get` command.**

   One of the following `States Asserted` fields appear after issuing the `sensor get` command from the IPMItool:

   - `States Asserted = Entity Presence`

     In the following example, the value shown for the `States Asserted = Entity Presence` field is *Absent*.

```
$ ipmitool sensor get  PCIE_CC/PRSNT
Locating sensor record...
Sensor ID              : PCIE_CC/PRSNT (0xad)
Entity ID             : 49.0
Sensor Type (Discrete): Entity Presence
States Asserted       : Entity Presence
[Absent]
```

   - `States Asserted = Availability State`

In the following example, the value shown for the `States Asserted = Availability State` field is *Device Absent*.

```
$ ipmitool sensor get PCIE1/PRSNT
Locating sensor record...
Sensor ID              : PCIE1/PRSNT (0xe6)
Entity ID             : 11.0
Sensor Type (Discrete): Entity Presence
States Asserted       : Availability State
[Device Absent]
```

## Manage Host Power-On, Power-Off and Shutdown Functions

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*

1. **To power on the host on a managed device, type: `chassis power on`**

   Example:

   $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   **chassis power on**

2. **To power off the host on a managed device, type: `chassis power off`**

   Example:

   $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   **chassis power off**

3. **To power cycle the host on a managed device, type: `chassis power cycle`**

   Example:

   $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username***-P** *password*

```
chassis power cycle
```

4. **To gracefully shut down the host power on a managed device, type: `chassis power soft`**

   Example:

   $**ipmitool -I [***orcltls***|***lanplus***]-H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   ```
   chassis power soft
   ```

# Manage Oracle ILOM Power Budget Interfaces

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*

1. **To set the Power Limit Activation State on a managed device, use one of the following commands:**

   - To activate, type:

     $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

     ```
     raw 0x2e 0x49 0x00 0x01 0xFF 0xFF
     ```

     Upon command completion:

     ```
     dc
     ```

   - To deactivate, type:

     $ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

     ```
     raw 0x2e 0x49 0x00 0x00 0xFF 0xFF
     ```

     Upon command completion:

     ```
     dc
     ```

The following table describes the Power Limit Activation State (IPMItool) input and output fields.

| Fields | Byte | Description |
|---|---|---|
| Input Data | 1 | Sunoem command group number: `0x2e`. |
| | 2 | Command code `0x49` sets the power limit activation state. |
| | 3 | Group extension identification: `0x00`. The value for this field is ignored. |
| | 4 | Sub-commands for power limit activation:<br><br>`0x00` - Deactivate power limit<br><br>`0x01` - Activate power limit |
| | 5-6 | Reserved fields `0xFF`. The values for these fields are ignored. |
| Output Data | 1 | Completion code consumed by IPMItool.<br><br>The system does not display a status for successful completion code. However, if the result of the completion code is anything other than '`successful`', a failure message appears. |
| | 2 | Group extension identification `dc`' appears upon command completion. |

2. **To get Power Limit Budget properties, type:**

---

**Note -** You should use a Get Power Limit Budget Wattage command prior to setting the Power Limit Budget Wattage property.

---

$ **`ipmitool -I [`***orcltls*`|`*lanplus*`] -H`** *SP_hostname_or_IPaddress* **`-U`** *username* **`-P`** *password*

**`raw 0x2e 0x4A 0x00 0x00 0x00`**

Upon command completion:

```
dc 00 01 b3 00 02 fa 00 00 00 00 01 e9 00 00
```

The following table describes the Get Power Limit (IPMItool) input and output fields:

| Field | Byte | Description |
|---|---|---|
| Input Data | 1 | Sunoem command group number: `0x2e`. |
| | 2 | Command code `0x4A` gets Power Budget settings. |
| | 3 | Group extension identification: `0x00`. The value for this field is ignored. |

| Field | Byte | Description |
|---|---|---|
| | 4-5 | Reserved fields `0x00`. Values for these fields are ignored. |
| Output Data | 1 | Completion code, consumed by IPMItool. Not displayed upon command completion. However if completion code is anything other than success, then a failure message is displayed upon command completion. |
| | 2 | Group extension identification. Displayed as '`dc` in the preceding example. |
| | 3 | Activation state:<br>`00` - Deactivated<br>`01` - Activated |
| | 4 | Reserved field. Note that the value `b3` in the preceding example can be ignored. |
| | 5 | Exception action, taken if power limit is exceeded and cannot be controlled within the correction time limit. Return values:<br>`00` - None<br>`01` - Hard power-off |
| | 6-7 | Power limit in watts. `02 fa` in the preceding example. |
| | 8-11 | Correction time limit in milliseconds. `00 00 00 00` in the preceding example. |
| | 12 | Flag indicating whether the correction time limit is the system default time limit.<br>`00` - Not default<br>`01` - Default |
| | 13 | Reserved field. Note that the value shown (`e9`) in the preceding example can be ignored. |
| | 14-15 | Reserved fields. Note that the value shown (`00 00`) in the preceding example can be ignored. |

3. **To set the Power Limit, type:**

---

**Note -** The set power limit commands sets the power budget limit for the system. Use this command to set the maximum system power usage. The power limit should always be persistent across AC and DC cycles.

---

$ **`ipmitool -I [`***orcltls*`|`*lanplus*`] -H`** *SP_hostname_or_IPaddress* **`-U`** *username* **`-P`** *password*

```
raw 0x2e 0x4B 0x00 0xff 0xff 0xff 0x01 0x02 0xaa 0x00 0x00 0x1b 0x58 0x00 0xff 0x00 0x00
```

Upon command completion:

```
dc 00
```

The following table describes Set Power Limit (IPMItool) input and output fields:

| Fields | Byte | Description |
|---|---|---|
| Input Data | 1 | Sunoem command group number: `0x2e`. |
| | 2 | Command code `0x4B` sets power budget settings. |
| | 3 | Group extension identification: `0x00`. The value for this field is ignored. |
| | 4-6 | Reserved fields: `0xff 0xff 0xff`. The values for this field are ignored. |
| | 7 | Exception action taken: `00` - none `01` - hard power-off |
| | 8-9 | Power limit in watts. For example: `0x2a 0xaa` |
| | 10-13 | Correction time limit in milliseconds. For example: `0x00 0x00 0x1b 0x58`. This value is ignored if the time limit is set to default; see next byte. |
| | 14 | A flag indicating whether to use the system default time limit. Correction time limit in bytes 10-13 will be ignored. `0x00` - not default `0x01` - default |
| | 15 | Reserved field `0xff`. The value for this field is ignored. |
| | 16-17 | Reserved field `0x00 0x00`. The values for these fields are ignored. |
| Output Data | 1 | Completion code that is consumed by IPMItool.<br><br>The system does not display a status for successful completion code. However, if the result of the completion code is anything other than successful, a failure message appears. |
| | 2 | Group extension identification '`dc`' appears upon command completion. |

# Manage the System Power Policy

**Note -** The settings defined in this procedure are not applicable to all server platforms.

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about the IPMI TLS interface that is provided by Oracle, see "IPMI TLS Service and Interface" on page 44.

1. **To get the current system power policy, type:**

$**ipmitool -I [***orcltls*|*lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

```
raw 0x2e 0x43 4
```

2. **To set the power manage policy to performance, type**

   $ **ipmitool -I [***orcltls*|*lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   ```
   raw 0x2e 0x42 2 00 00 00 00
   ```

3. **To set the power manage policy to elastic, type:**

   $ **ipmitool -I [***orcltls*|*lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   ```
   raw 0x2e 0x42 2 00 00 00 01
   ```

4. **To set the power manage policy to disabled, type:**

   $ **ipmitool -I [***orcltls*|*lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

   ```
   raw 0x2e 0x42 2 00 00 00 02
   ```

The following table describes the Power Management Policy State (IPMItool) input fields:

| Fields | Byte | Description |
|---|---|---|
| **Input Data** | 1 | Sunoem command group number: `0x2e`. |
| | 2 | Command code `0x42` sets the Power Policy Activation State. |
| | 3 | Group extension identification: `2`. |
| | 4-6 | Reserved fields. |
| | 7 | Sub-commands for power policy activation: `00` - Performance policy `01` - Elastic policy `02` - Disable the policy |

# ▼ Display FRU Manufacturing Details

---

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about the IPMI TLS interface that is provided by Oracle, see "IPMI TLS Service and Interface" on page 44.

---

- **To display Field Replacement Unit (FRU) manufacturing details on a managed device, use the `fru print` command.**

Example:

$ **ipmitool -I [***orcltls***|***lanplus***] -H** *SP_hostname_or_IPaddress* **-U** *username* **-P** *password*

**fru print**

The output might look like like the following:

```
FRU Device Description : Builtin FRU Device (ID 0)
 Board Product         : ASSY,ANDY,4SKT_PCI-E,BLADE
 Board Serial          : 0000000-7001
 Board Part Number     : 501-7738-01
 Board Extra           : AXX_RevE_Blade
 Product Manufacturer  : ORACLE
 Product Name          : ILOM

FRU Device Description : /SYS (ID 4)
 Chassis Type          : Rack Mount Chassis
 Chassis Part Number   : 541-0251-05
 Chassis Serial        : 00:03:BA:CD:59:6F
 Board Product         : ASSY,ANDY,4SKT_PCI-E,BLADE
 Board Serial          : 0000000-7001
 Board Part Number     : 501-7738-01
 Board Extra           : AXX_RevE_Blade
 Product Manufacturer  : ORACLE
 Product Name          : SUN BLADE X8400 SERVER MODULE
 Product Part Number   : 602-0000-00
 Product Serial        : 0000000000
 Product Extra         : 080020ffffffffffffff0003baf15c5a

FRU Device Description : /P0 (ID 5)
 Product Manufacturer  : ADVANCED MICRO DEVICES
 Product Part Number   : 0F21
 Product Version       : 2

FRU Device Description : /P0/D0 (ID 6)
 Product Manufacturer  : MICRON TECHNOLOGY
 Product Name          : 1024MB DDR 400 (PC3200) ECC
 Product Part Number   : 18VDDF12872Y-40BD3
 Product Version       : 0300
 Product Serial        : D50209DA
 Product Extra         : 0190
 Product Extra         : 0400

FRU Device Description : /P0/D1 (ID 7)
 Product Manufacturer  : MICRON TECHNOLOGY
 Product Name          : 1024MB DDR 400 (PC3200) ECC
```

```
Product Part Number   : 18VDDF12872Y-40BD3
Product Version       : 0300
Product Serial        : D50209DE
Product Extra         : 0190
Product Extra         : 0400
```

## ▼ Display Oracle ILOM Event or Audit Log

---

**Note -** The IPMI TLS interface (`orcltls`) interface is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*.

---

1. **To display the Oracle ILOM Audit log, type:** **`sunoem cli "show /SP/logs/audit/list"`**

   Example:

   $ **`ipmitool -I [`***orcltls***`|`***lanplus***`] -H`** *SP_hostname_or_IPaddress* **`-U`** *username***`-P`** *password*

   **`sunoem cli "show /SP/logs/audit/list"`**

   The Audit Log output might look like the following:

```
Audit
ID     Date/Time                 Class     Type      Severity
-----  ------------------------  --------  --------  --------
12050  Sat Dec 31 20:33:17 2016  Audit     UI        minor
       root : Open Session : object = "/SP/sessions/38701/type" : value =
       "shell" : success
12049  Sat Dec 31 20:31:19 2016  Audit     UI        minor
       root : Close Session : object = "/SP/sessions/38699/type" : value =
       "shell" : success
12048  Sat Dec 31 20:30:57 2016  Audit     UI        minor
       root : Open Session : object = "/SP/sessions/38699/type" : value =
       "shell" : success
12047  Sat Dec 31 20:29:16 2016  Audit     IPMI      minor
       root : Close Session : session ID = 3279888664 : success
12046  Sat Dec 31 20:29:16 2016  Audit     IPMI      minor
       root : Set Session Privilege Level: privilege level = admin : success
12045  Sat Dec 31 20:29:16 2016  Audit     IPMI      minor
       IPMI 2.0 Login Success : User = root, Client IP = #.#.#.#
12044  Sat Dec 31 19:02:28 2016  Audit     IPMI      minor
```

```
       root : Close Session : session ID = 3075033282 : success
12043  Sat Dec 31 19:02:28 2016  Audit     IPMI      minor
       root : Set Session Privilege Level: privilege level = admin : success
Paused: press any key to continue, or 'q' to quitSession closed
```

2. **To display the Oracle ILOM Event log, type:** **`sel list`**

   Example:

   $ **`ipmitool -I [`***orcltls*|*lanplus***`] -H`** *SP_hostname_or_IPaddress* **`-U`** *username* **`-P`** *password*

   **`sel list`**

   The Event Log output might look like the following:

```
 100 | Pre-Init Time-stamp   | Power Unit #0x78 | State Deasserted
 200 | Pre-Init Time-stamp   | Power Supply #0xa2 | Predictive Failure Asserted
 300 | Pre-Init Time-stamp   | Power Supply #0xba | Predictive Failure Asserted
 400 | Pre-Init Time-stamp   | Power Supply #0xc0 | Predictive Failure Asserted
 500 | Pre-Init Time-stamp   | Power Supply #0xb4 | Predictive Failure Asserted
 600 | 04/05/2007 | 12:03:24 | Power Supply #0xa3 | Predictive Failure Deasserted
 700 | 04/05/2007 | 12:03:25 | Power Supply #0xaa | Predictive Failure Deasserted
 800 | 04/05/2007 | 12:03:25 | Power Supply #0xbc | Predictive Failure Deasserted
 900 | 04/05/2007 | 12:03:26 | Power Supply #0xa2 | Predictive Failure Asserted
 a00 | 04/05/2007 | 12:03:26 | Power Supply #0xa8 | Predictive Failure Deasserted
 b00 | 04/05/2007 | 12:03:26 | Power Supply #0xb6 | Predictive Failure Deasserted
 c00 | 04/05/2007 | 12:03:26 | Power Supply #0xbb | Predictive Failure Deasserted
 d00 | 04/05/2007 | 12:03:26 | Power Supply #0xc2 | Predictive Failure Deasserted
 e00 | 04/05/2007 | 12:03:27 | Power Supply #0xb0 | Predictive Failure Deasserted
 f00 | 04/05/2007 | 12:03:27 | Power Supply #0xb5 | Predictive Failure Deasserted
1000 | 04/05/2007 | 12:03:27 | Power Supply #0xba | Predictive Failure Asserted
1100 | 04/05/2007 | 12:03:27 | Power Supply #0xc0 | Predictive Failure Asserted
1200 | 04/05/2007 | 12:03:28 | Power Supply #0xa9 | Predictive Failure Deasserted
1300 | 04/05/2007 | 12:03:28 | Power Supply #0xae | Predictive Failure Deasserted
1400 | 04/05/2007 | 12:03:28 | Power Supply #0xb4 | Predictive Failure Asserted
1500 | 04/05/2007 | 12:03:28 | Power Supply #0xbe | Predictive Failure Deasserted
```

# IPMItool Options and Command Summary

The following tables summarize the supported IPMItool options and commands:


- Table 7, “Supported IPMItool Options,” on page 67
- Table 8, “Supported IPMItool Commands ,” on page 69

**Note -** The IPMI TLS interface (`orcltls`) is supported as of Oracle ILOM firmware version 3.2.8 and later. For a higher level of security, you should always specify the IPMI TLS interface (`-I orcltls`) when executing Oracle ILOM commands from the IMPItool utility. For more information about using the IPMI TLS interface from Oracle, see these topics:"IPMI TLS Service and Interface" on page 44 and "Configure IPMI Management Access for Increased Security" in *Oracle ILOM Security Guide For Firmware Releases 3.x and 4.x*.

**TABLE 7** Supported IPMItool Options

| IPMI Option | Function |
|---|---|
| `-a` | Prompt for the remote server password. |
| `-A` [*authtype*] | Specify an authentication type to use during IPMI v1.5 `lan` session activation. Supported authentication types are NONE, PASSWORD, MD2, MD5, or OEM. |
| `-c` | Present output in CSV (comma separated variable) format. This is not available with all commands. |
| `-e` [*sol_escape_char*] | Use supplied character for SOL session escape character. The default is to use but this can conflict with SSH sessions. |
| `-K` | Read Kg key from IPMI_KGKEY environment variable. |
| `-k` [*key*] | Use supplied Kg key for IPMI v2 authentication. The default is not to use any Kg key. |
| `-y` [*hex key*] | Use supplied Kg key for IPMI v2 authentication. The key is expected in hexadecimal format and can be used to specify keys with non-printable characters. For example: '-k PASSWORD' and 'y 50415353574F5244' are equivalent. The default is not to use any Kg key. |
| `-Y` | Prompt for the Kg key for IPMI v2 authentication. |
| `-C` [*ciphersuite*] | The remote server authentication, integrity, and encryption algorithms to use for IPMI v2 `lanplus` connections. See table 22-19 in the IPMIv2 specification. The default is 3 which specifies RAKP-HMAC-SHA1 authentication, HMAC-SHA1-96 integrity, and AES-CBC-128 encryption algorithms. |
| `-E` | The remote server password is specified by the environment variable IPMI_PASSWORD. |
| `-f` [*password_file*] | Specifies a file containing the remote server password. If this option is absent, or if password_file is empty, the password will default to NULL. |
| `-h` | Get basic usage help from the command line. |
| `-H` [*address*] | Remote server address, can be IP address or hostname. This option is required for `lan` and `lanplus` interfaces. |
| `-i` [*interface*] | Selects the IPMI interface to use. Supported interfaces that are compiled in are visible in the usage help output. No auto-detect is attempted. See the `-I` description for more information. |
| `-I [interface]` | Attempt the most secure interface first (`orcltls`). If the BMC does not support the interface, attempt the next most secured interface |

| IPMI Option | Function |
|---|---|
| | until the specified interface. Supported interfaces that are compiled in are visible in the usage help output. If `lanplus` interface or `lan` interface is specified, certificate checking is disabled when attempting the `orcltls` interface.<br>**Note -** If the `-I` option is not specified, auto-detect is enabled and certificate checking is enabled when attempting the `orcltls` interface. |
| `-m` [*local_address*] | Set the local IPMB address. The default is 0x20 and there should be no need to change it for normal operation. |
| `-N` [*sec*] | Specify number of seconds between retransmissions of `lan` or `lanplus` messages. Default are 2 seconds for `lan` and 1 second for `lanplus` interfaces. |
| `-o` [*oemtype*] | Select OEM type to support. This usually involves minor hacks in place in the code to work around quirks in various BMCs from various manufacturers. Use -o list to see a list of current supported OEM types. |
| `-O` [*sel oem*] | Open selected file and read OEM SEL event descriptions to be used during SEL listings. |
| `-p` [*port*] | The remote server TLS TCP connection port is 443 (default).<br><br>For IPMI v2.0 and 1.5, the remote server UDP TCP connection is port 623 (default). |
| `-P` [*password*] | Remote server password is specified on the command-line. If supported it will be obscured in the process list.<br>**Note -** Specifying the password as a command-line option is not recommended. |
| `-R` [*count*] | Set the number of retries for `lan` interface or `lanplus` interface (default=4). |
| `-S` [*sdr_cache_file*] | Use local file for remote SDR cache. Using a local SDR cache can drastically increase performance for commands that require knowledge of the entire SDR to perform their function. Local SDR cache from a remote system can be created with the `sdr dump` command. |
| `-t` [*target_address*] | Selects IPMI interface to use. Supported interfaces that are compiled in are visible in the usage help output. |
| `-U` [*username*] | Remote server username, default is NULL user. |
| `-d N` | Use device number N to specify the `/dev/ipmiN` (or `/dev/ipmi/N` or `/dev/ipmidev/N`) device to use for in-band BMC communication. Used to target a specific BMC on a multi-node, multi-BMC system through the IPMI device driver interface. Default is 0. |
| `-v` | Increase verbose output level. This option may be specified multiple times to increase the level of debug output. If given three times you will get hexdumps of all incoming and outgoing packets. |
| `-V` | Display version information. |
| `--no-cert-check` | Disables the check for validating the SSL certificate when the *orcltls* IPMI interface is specified. |

| IPMI Option | Function |
|---|---|
| `--cert-dir [path]` | Location of trusted SSL certificates on host server SP. |

**TABLE 8** Supported IPMItool Commands

| IPMI Command | Function |
|---|---|
| `sunoem sshkey set` | Configure an SSH key for a remote shell user. |
| `ipmitool sunoem sshkey del` | Remove an SSH key from a remote shell user. |
| `ipmitool sunoem led get` | Read LED status. |
| `ipmitool sunoem led set` | Set LED status. |
| `ipmitool sunoem cli` | Enter Oracle ILOM CLI commands as if you were using the ILOM CLI directly. The `lan` interface or `lanplus` interface should be used. |
| `ipmitool sunoem CLI force` | Available as of Oracle ILOM 3.0.10, a `force` option can be invoked as an argument to the `sunoem` CLI command. |
| `ipmitool raw` | Execute raw IPMI commands. |
| `ipmitool lan print` | Print the current configuration for the given channel. |
| `ipmitool lan set (1) (2)` | Set the given parameter on the given channel. |
| `ipmitool chassis status` | Display information regarding the high-level status of the system chassis and main power subsystem. |
| `ipmitool chassis power` | Perform a chassis control command to view and change the power state. |
| `ipmitool chassis identify` | Control the front panel identify light. Default is 15. Use 0 to turn off. |
| `ipmitool chassis restart_cause` | Query the chassis for the cause of the last system restart. |
| `ipmitool chassis bootdev (1)` | Request the system to boot from an alternative boot device on next reboot. |
| `ipmitool chassis bootparam (1)` | Set the host boot parameters. |
| `ipmitool chassis selftest` | Display the BMC self-test results. |
| `ipmitool power` | Return the BMC self-test results. |
| `ipmitool event` | Send a predefined event to the system event log. |
| `ipmitool sdr` | Query the BMC for sensor data records (SDR) and extract sensor information of a given type, then query each sensor and print its name, reading, and status. |
| `ipmitool sensor` | List sensors and thresholds in a wide table format. |
| `ipmitool fru print` | Read all field-replaceable unit (FRU) inventory data and extract such information as serial number, part number, asset tags, and short strings describing the chassis, board, or product. |
| `ipmitool sel` | View the Oracle ILOM SP system event log (SEL). |
| `ipmitool pef info` | Query the BMC and print information about the PEF- supported features. |
| `ipmitool pef status` | Print the current PEF status (the last SEL entry processed by the BMC, and so on). |

| IPMI Command | Function |
|---|---|
| `ipmitool pef list` | Print the current PEF list (the last SEL entry processed by the BMC, and so on). |
| `ipmitool user` | Display a summary of user ID information, including maximum number of user IDs, the number of enabled users, and the number of fixed names defined. |
| `ipmitool session` | Get information about the specified sessions. You can identify sessions by their ID, by their handle number, by their active status, or by using the keyword “all” to specify all sessions. |
| `ipmitool firewall (1)` | Enable or disable individual command and command sub-functions; determine which commands and command sub-functions can be configured on a given implementation. |
| `ipmitool set (1)` | Set the runtime options including session host name, user name, password, and privilege level. |
| `ipmitool exec` | Execute IPMItool commands from file name. Each line is a complete command. |

# SNMP Command Examples

| Description | Links |
| --- | --- |
| Example SNMP Commands | ■ "snmpget Command" on page 71<br>■ "snmpwalk Command" on page 72<br>■ "snmpbulkwalk Command" on page 73<br>■ "snmptable Command" on page 74<br>■ "snmptrapd Command" on page 76 |

### Related Information

- "SNMP Overview" on page 9
- "Configuring SNMP Settings in Oracle ILOM" on page 17

## `snmpget` Command

**`snmpget`** *SNMP_agent* **`sysName.0`**

As stated in the description of the `sysName.0` MIB object in the SNMPv2-MIB, this command returns an administratively assigned name for this managed node. By convention, this is the node's fully qualified domain name. If the name is unknown, the value returned is the zero-length string.

For example:

```
% snmpget SNMP_agent sysName.0 sysObjectID.0
SNMPv2-MIB::sysName.0 = STRING: SUNSPHOSTNAME
SNMPv2-MIB::sysObjectID.0 = OID: SUN-HW-TRAP-MIB::products.200.2.1.1
```

In addition to the `sysName.0` object, this command displays the content of the `sysObjectID.0` MIB objects. Notice that the MIB file name is given for each MIB object as part of the reply.

The following descriptions of the MIB objects are taken from the MIB files.

- sysName – An administratively assigned name for this managed node. By convention, this is the node's fully qualified domain name. If the name is unknown, the value is the zero-length string.
- sysObjectID – The vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprises sub-tree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining ”what kind of box” is being managed.

## snmpwalk Command

The snmpwalk command performs a sequence of chained GETNEXT requests automatically. It is a work-saving command. Rather than having to issue a series of snmpgetnext requests, one for each object ID, or node, in a subtree, you can issue one snmpwalk request on the root node of the subtree and the command gets the value of every node in the subtree.

For example:

```
% snmpwalk SNMP_agent system
SNMPv2-MIB::sysDescr.0 = STRING: ILOM machine custom description
SNMPv2-MIB::sysObjectID.0 = OID: SUN-HW-TRAP-MIB::products.200.2.1.1
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (16439826) 1 day, 21:39:58.26
SNMPv2-MIB::sysContact.0 = STRING: set via snmp test
SNMPv2-MIB::sysName.0 = STRING: SUNSPHOSTNAME
SNMPv2-MIB::sysLocation.0 = STRING:
SNMPv2-MIB::sysServices.0 = INTEGER: 72
SNMPv2-MIB::sysORLastChange.0 = Timeticks: (14) 0:00:00.14
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
SNMPv2-MIB::sysORID.2 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.3 = OID: TCP-MIB::tcpMIB
SNMPv2-MIB::sysORID.4 = OID: RFC1213-MIB::ip
SNMPv2-MIB::sysORID.5 = OID: UDP-MIB::udpMIB
SNMPv2-MIB::sysORID.6 = OID: SNMP-VIEW-BASED-ACM-MIB::vacmBasicGroup
SNMPv2-MIB::sysORID.7 = OID: SNMP-FRAMEWORK-MIB::snmpFrameworkMIBCompliance
SNMPv2-MIB::sysORID.8 = OID: SNMP-MPD-MIB::snmpMPDCompliance
SNMPv2-MIB::sysORID.9 = OID: SNMP-USER-BASED-SM-MIB::usmMIBCompliance
SNMPv2-MIB::sysORDescr.1 = STRING: The MIB module to describe generic objects
for network interface sub-layers
SNMPv2-MIB::sysORDescr.2 = STRING: The MIB module for SNMPv2 entities
SNMPv2-MIB::sysORDescr.3 = STRING: The MIB module for managing TCP
implementations
```

```
SNMPv2-MIB::sysORDescr.4 = STRING: The MIB module for managing IP and ICMP
implementations
SNMPv2-MIB::sysORDescr.5 = STRING: The MIB module for managing UDP
implementations
SNMPv2-MIB::sysORDescr.6 = STRING: View-based Access Control Model for SNMP.
SNMPv2-MIB::sysORDescr.7 = STRING: The SNMP Management Architecture MIB.
SNMPv2-MIB::sysORDescr.8 = STRING: The MIB for Message Processing and
Dispatching.
SNMPv2-MIB::sysORDescr.9 = STRING: The management information definitions for
the SNMP User-based Security Model.
SNMPv2-MIB::sysORUpTime.1 = Timeticks: (1) 0:00:00.01
SNMPv2-MIB::sysORUpTime.2 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.3 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.4 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.5 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.6 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.7 = Timeticks: (14) 0:00:00.14
SNMPv2-MIB::sysORUpTime.8 = Timeticks: (14) 0:00:00.14
SNMPv2-MIB::sysORUpTime.9 = Timeticks: (14) 0:00:00.14
```

## snmpbulkwalk Command

The snmpbulkwalk command uses the GETBULK SNMP protocol feature to query for an entire tree of information about a network entity. This command can pack more objects into the packets by specifying “repeaters.” As a result, the snmpbulkwalk command is faster than the snmpwalk command.

Here is an example of the snmpwalk command with approximate start and end time stamps.

```
% date ; snmpwalk SNMP_agent entPhysicalTable >
/dev/null ; date
Sun Jun 30 18:15:38 EDT 2013
Sun Jun 30 18:16:46 EDT 2013
```

Here is an example of the snmpbulkwalk command performing the same operation. Notice that the snmpbulkwalk command is faster than the snmpwalk command.

```
% date ; snmpbulkwalk SNMP_agent entPhysicalTable >
/dev/null ; date
Sun Jun 30 18:19:19 EDT 2013
Sun Jun 30 18:19:38 EDT 2013
```

# snmptable Command

The snmptable command retrieves the contents of an SNMP table and displays the contents in a tabular format, that is, one table row at a time, such that the resulting output resembles the table being retrieved. This is contrasted with the snmpwalk command, which displays the contents of the table one column at a time.

Here is an example of the snmptable command:

```
% snmptable  SNMP_agent sysORTable
SNMP table: SNMPv2-MIB::sysORTable
sysORID                   sysORDescr                    sysORUpTime
IF-MIB::ifMIB             The MIB module to             0:0:00:00.01
describe generic objects
SNMPv2-MIB::snmpMIB       The MIB module for SNMPv2     0:0:00:00.02
for network interface
entities.
TCP-MIB::tcpMIB           The MIB module for            0:0:00:00.02
sub-layers.
managing TCP
UDP implementations.
UDP-MIB::udpMIB           The MIB module for managing   0:0:00:00.02
RFC1213-MIB::ip           The MIB module for managing   0:0:00:00.02
implementations.
SNMP-VIEW-BASED-ACM-      View-based Access Control     0:0:00:00.02
SNMP-FRAMEWORK-MIB::      The SNMP Management           0:0:00:00.14
IP and ICMP implementations.
MIB::vacmBasicGroup       Model for SNMP.
snmpFrameworkMIB          Architecture MIB.
Compliance
SNMP-MPD-MIB::snmp        The MIB for Message           0:0:00:00.14
MPDCompliance             Processing and Dispatching.
SNMP-USER-BASED-SM-       The management information    0:0:00:00.14
MIB::usmMIBCompliance     definitions for the SNMP
User-based Security Model.
```

**Note -** While the snmpget, snmpgetnext, and snmpwalk command can be used on any type of MIB object, the snmptable command can be used only on MIB table objects. If this command is given any other type of object ID, it will be rejected. This restriction applies to a table entry object, a table column object, and any object that represents information within a table. Only a MIB table object ID can be used with the snmptable command.

In the examples of the snmptable command, the -Ci and -Cb options are used. For example, here is an snmptable command with the -Ci option:

```
% snmptable -Ci  SNMP_agent  sunPlatFanTable
SNMP table: SUN-PLATFORM-MIB::sunPlatFanTable
index sunPlatFanClass
10                        fan
11                        fan
17                        fan
23                        fan
29                        fan
30                        fan
36                        fan
42                        fan
```

Here is an example of an `snmptable` command without the `-Ci` option. Notice that the index column is not displayed:

```
% snmptable  SNMP_agent sunPlatFanTable
SNMP table: SUN-PLATFORM-MIB::sunPlatFanTable
sunPlatFanClass
fan
fan
fan
fan
fan
```

Here is an example of an `snmptable` command with the `-Ci` and `-Cb` options. The output is abbreviated.

```
% snmptable -Ci -Cb  SNMP_agent entPhysicalTable
index                   Descr              VendorType   ContainedIn
SNMP table: ENTITY      ?SNMPv2-           0            chassis
-MIB::entPhysical       SMI:zeroDotZero
1
Table
```

Here is an example of the same `snmptable` command with the `-Ci` option but without the `-Cb` option. Again the output is abbreviated. Notice that the name of the MIB object is repeated on each heading.

```
% snmptable -Ci  SNMP_agent entPhysicalTable
index                   entPhysicalDescr   entPhysical   entPhysical
 VendorType    ContainedIn
SNMP table: ENTITY      ?SNMPv2-           0             chassis
1
-MIB::entPhysical       SMI:zeroDotZero
```

Here is an example of an snmptable command using version 3 of the SNMP protocol:

```
% snmptable -Cb -Ci -mALL -v3 -aMD5 -utestuser -Apassword -lauthNoPriv
SNMP_agent:port sunPlatPowerSupplyTable
SNMP table: SUN-PLATFORM-MIB::sunPlatPowerSupplyTable
index sunPlatPowerSupplyClass
90             powerSupply
92             powerSupply
96             powerSupply
```

The following snmptable command returns an empty table.

```
% snmptable -Cb -Ci  SNMP_agent sunPlatBatteryTable
SUN-PLATFORM-MIB::sunPlatBatteryTable: No entries
```

## snmptrapd Command

snmptrapd is an SNMP application that receives and logs SNMP trap and inform messages.

The following alert management rule example shows how to configure Oracle ILOM to send traps to a particular trap-receiver, such as, snmptrapd running on a server with the specified destination ip address.

```
-> set /SP/alertmgmt/rules/1 type=snmptrap snmp_version=3 destination=dest_ipaddress
destination_port=port_number community_or_username=username level=minor
```

**Note -** It is important to test the alert management rule configuration to ensure the it is configured properly.

To verify traps are sent and received, type:

```
-> set /SP/alertmgmt/rules/n testrule=true
```

The following screen shows a sample output when a testalert trap is received at the management station:

```
SUN-HW-TRAP-MIB::sunHwTrapTestMessage.0 = STRING:
```

# Index

## S