HP Advanced Power Manager User Guide

Abstract

This guide provides installation and operation guidance for the HP Advanced Power Manager. This guide is for the person who installs, administers, and troubleshoots servers and storage systems.

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Contents

Introduction

HP APM overview

HP APM is a rack-level point of contact for HP ProLiant Scalable System and HP Apollo administration. For a full description of HP APM features and support, see the Quick Specs on the HP website (http://h18000.www1.hp.com/products/quickspecs/14189_div/14189_div.pdf).

HP APM enables:

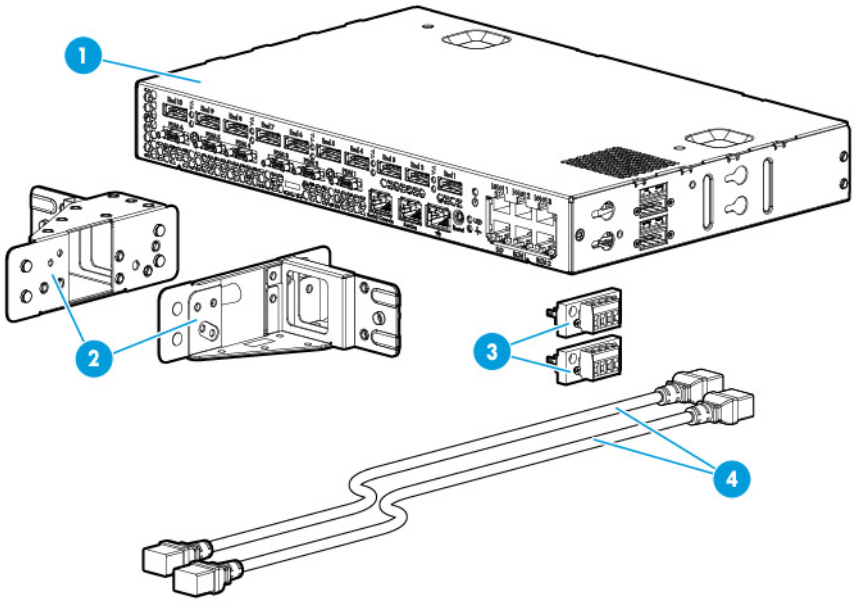
- Discovery of server rack components by topology
- Node-level power monitoring and control
- Support of logging through standard syslog servers
- Support for power capping at the rack level

NOTE: The use of the term server represents nodes, server trays, server nodes, and cartridges.

SL APM has been replaced by HP APM. Though there is shared functionality, the two products should be treated as mutually exclusive. The content included in this document is specific to HP APM, and is not applicable to SL APM.

- For more information on SL APM support, see the *HP ProLiant SL Advanced Power Manager User Guide* on the HP website (http://www.hp.com/support/SLAPM_UG_en).
- For more information on HP APM support, see the *HP Advanced Power Manager User Guide* on the HP website (http://www.hp.com/support/APM_UG_en).

HP APM kit contents



Item	Description
1	HP APM
2	Mounting brackets (2)
3	Terminal blocks (2)
4	Power cords (2)
5	Bracket mounting screws, T-20 (2)*
6	Rack mounting screws, 10-32 (2)*
7	Cage nuts (2)*
8	This document*

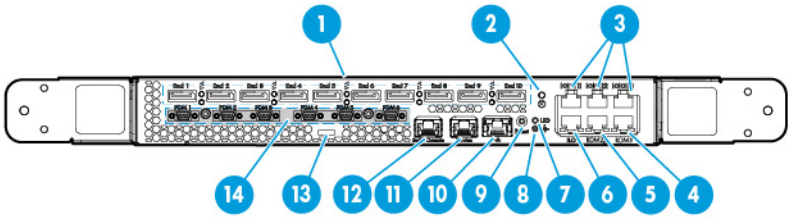
*Not shown

The following cables are required to connect the HP APM to the system:

- Consolidated Management cable
- Micro DB9 to DB9 cable or Micro DB9 to Micro DB9 cable
- Ethernet cable

All cables are sold separately.

HP APM front view

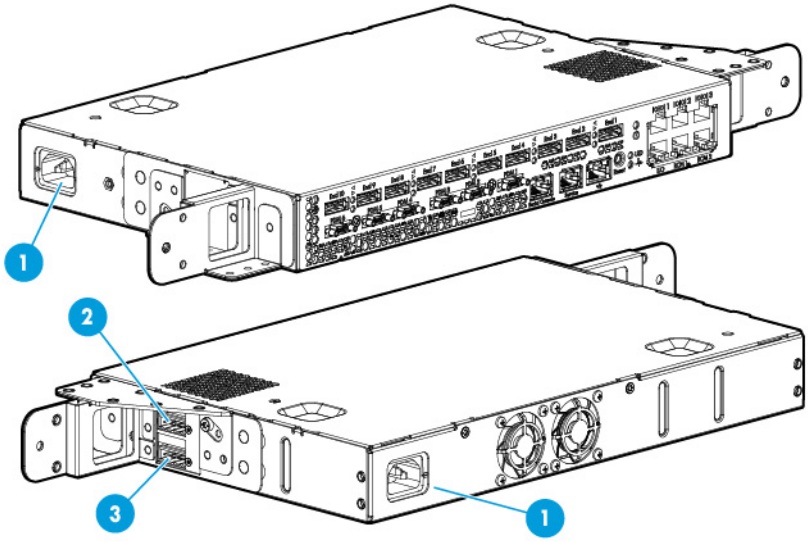


Item	Description
1	Consolidated Management Ports 1 through 10 (RDM1)
2	Power LED
3	Serial management for top of rack switch
4	RDM3 port for HP APM distribution module
5	RDM2 port for HP APM distribution module
6	iLO port
7	UID
8	Health LED
9	Reset button
10	Ethernet Management port
11	Service port
12	Serial console port
13	Micro SD slot
14	Power Distribution Module ports

NOTE: HP recommends configuring the HP APM so that it controls only one rack.

HP APM has six power distribution ports on the front of the unit. The HP APM has two RDM ports, and each RDM port has 10 connections to SL Scalable System enclosures.

HP APM rear view



Item	Description
1	Power plugs 1 and 2
2	On-Generator and AUX signals
3	Redundant reset

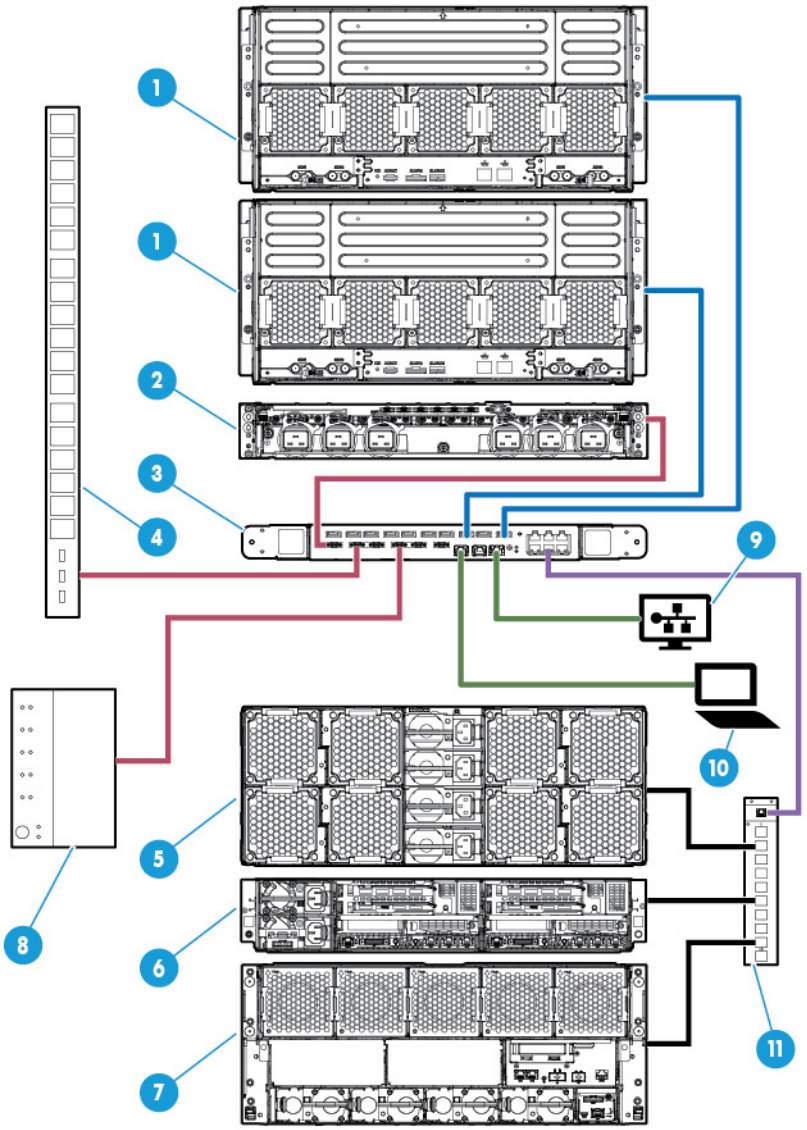
HP APM connections

HP APM offers new rack level management solutions that consolidate IT control, monitoring, and console access to hosted server, storage, fabric, and power resources to a single wire at the chassis level.

- 10 Consolidated Management Ports, which include ethernet, serial, and hardware signaling ports, connect to each SL chassis mounted rack.
- Six Power Distribution Module ports are used to interface directly to rack mounted power feed infrastructure.
- The Redundant Reset port is used to connects to another HP APM module (Buddy).

The following figure shows the HP APM unit connected to 10 unique chassis through the Consolidated Management Ports (RDM1). While RDM connectors are provided for backwards compatibility with existing HP ProLiant SL servers, connecting through the Consolidated Management Ports is the preferred wiring solution for new SL servers.

Depending on the product being connected to the HP APM, the HP APM connects to the system components using various cables. All cables required for connecting the HP APM to the system must be purchased separately.



Item	Component	Connects To
1	HP Apollo a6000 Chassis	The RDM1 connector on the HP APM
2	HP Apollo 6000 Power Shelf	The Power Distribution Module ports on the HP APM
3	HP APM	—
4	Power Distribution Unit	The Power Distribution Module ports on the HP APM
5	HP ProLiant SL Series Chassis	Server port on the RDM
6	HP ProLiant SL Series Chassis	Server port on the RDM
7	HP Moonshot 1500 Chassis	Server port on the RDM
8	HP Intelligent Modular PDU Managed Extension Bar	The Power Distribution Module ports on the HP APM
9	Production network	Ethernet port on the HP APM

Item	Component	Connects To
10	Terminal	Serial console port on the HP APM
11	RDM	• RDM2 or RDM3 port on the HP APM • RDM/HP APM* port on the product chassis

*Some products may identify this as the SL APM port.

NOTE: HP APM considers the10 Consolidated Management Ports as RDM1.

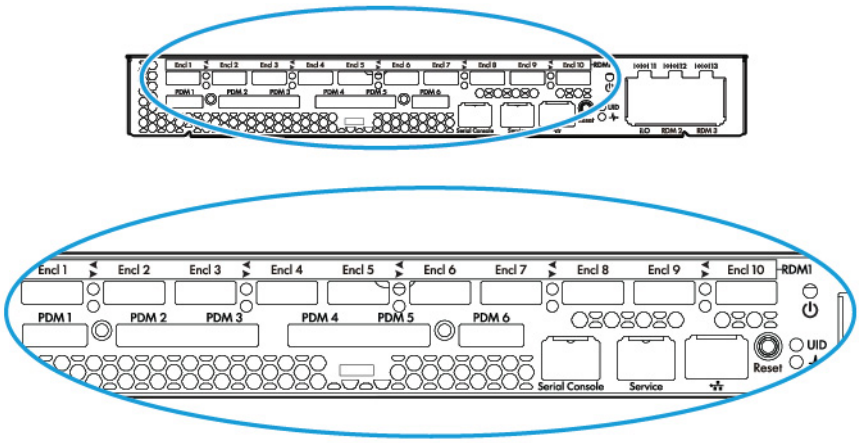
Required connections

Connection	Required cables
HP APM to chassis	Consolidated Management cables
HP APM to power device*	Micro DB9 to DB9 cable or Micro DB9 to Micro DB9 cable
HP APM to management and production networks	Ethernet cable
HP APM to RDM	RJ-45 cable included with the RDM
RDM to chassis	These cables are attached to the RDM.

*Power devices include a power shelf, power distribution unit, HP Intelligent Extension Bar, or other power devices, if installed.

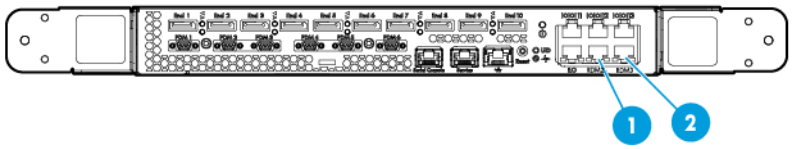
Identifying the RDM1 ports

For products using HP APM, connect the chassis to one of the corresponding consolidated management ports (RDM1) on the HP APM module.



Identifying the RDM2 and RDM3 ports

Consolidated management ports (RDM1) are used only for products designed to work with HP APM when a separate RDM is not required. When connecting the HP APM module to an RDM, always use either the RDM2 or RDM3 ports.



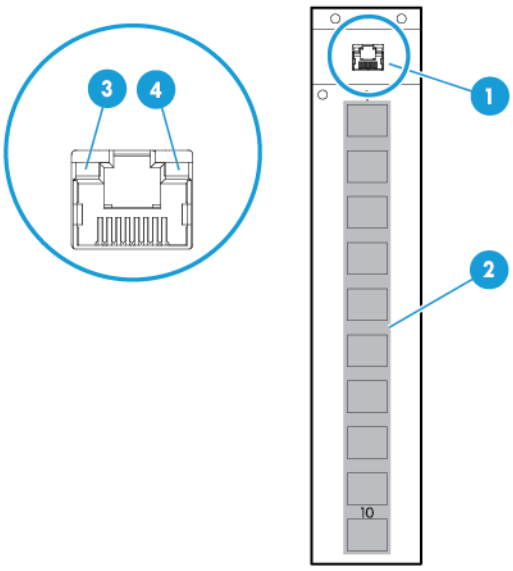
Item	Description
1	RDM2 port
2	RDM3 port

HP SL Advanced Power Manager Distribution Module

The distribution module includes a connector bay for the HP APM and cables for SL Scalable Series servers. It is backwards compatible with SL APM. The following servers and chassis require the use of the distribution module:

- HP Moonshot System
- HP ProLiant SL2500 Scalable System
- HP ProLiant SL4500 Server Series
- HP ProLiant SL6500 Scalable System

For more information, see the HP website (http://www.hp.com/go/scalable).



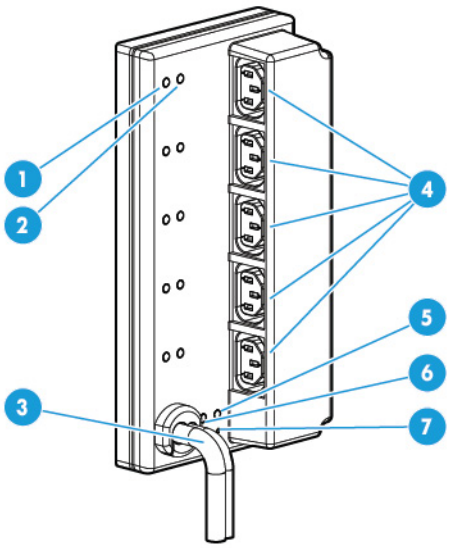
Item	Description
1	Connector port to the RDM2 or RDM3 ports on HP APM
2	SL Scalable Series server connectors
3	Power (green) LED, which indicates connection to port
4	Activity (amber) LED, which indicates activity to HP APM Distribution Module

The HP Apollo a6000 Chassis connects directly to the Consolidated Management Ports (RDM1). For more information, see "Naming and numbering conventions (on page 16)."

HP Intelligent Modular PDU Managed Extension Bar

The extension bar provides power management for external devices. The extension bar, when used with the HP cable part number SF672A and HP APM, is not intended for power management of SL enclosures.

The total rating of the Intelligent Extension Bar is 16 A.



Callout	Description
1	Row of green power indicators (one for each outlet)
2	Row of blue UID indicators (one for each outlet)
3	2.4-m (8-ft) input power cord
4	Five managed 10 A, IEC-320 C13 outlets
5	Blue UID indicator for the Intelligent Extension Bar
6	Green power indicator for the Intelligent Extension Bar
7	Reset button*

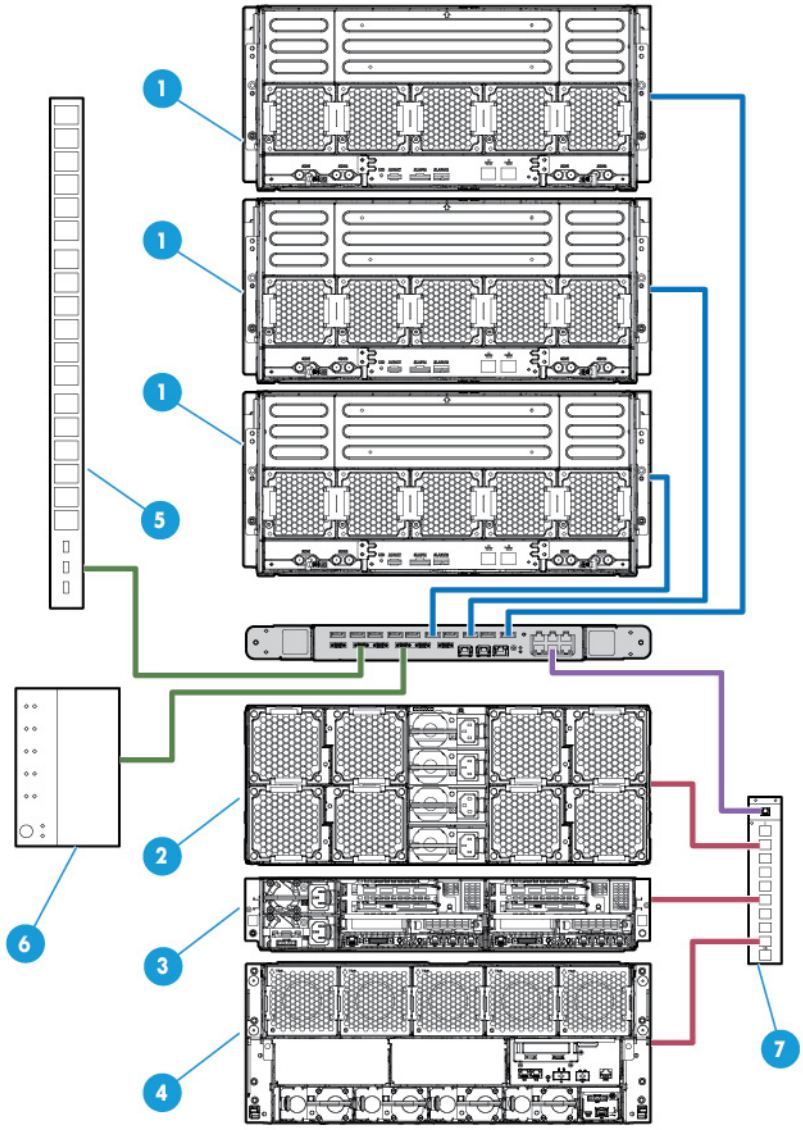
*When you press the Reset button, power to the managed outlets is maintained. Management functionality is momentarily lost while the Intelligent Extension Bar resets.

Using RJ-45 connections

You can have one HP APM per power network (one CLI interface over an Ethernet). One HP APM can connect up to two HP APM Rack Distribution Modules. Each SL APM Rack Distribution Module can connect up to 10 SL chassis with an RJ-45 connection or an 8-pin standard connector that comes with the RDM.

Naming and numbering conventions

The following figure shows an example of the basic HP APM configuration and node numbering convention on a scalable system enclosure. The SL APM Distribution Module allows you to extend the functionality of the HP APM to more than one server. For more information, see the SL APM Distribution Module ("HP SL Advanced Power Manager Distribution Module" on page 14).



Item	Description
1	HP Apollo a6000 Chassis
2	HP ProLiant SL Series Chassis

Item	Description
3	HP ProLiant SL Series Chassis
4	HP Moonshot 1500 Chassis
5	Power Distribution Unit
6	HP Intelligent Modular PDU Managed Extension Bar
7	SL APM Distribution Module

When entering commands that require specific port and node numbers, use the HP APM port number, SL APM Distribution Module port number, and the SL server node number.

For example, to turn on the power for SL server node 3 that is connected to SL APM Distribution Module port 4, which is connected to HP APM port 2, enter the following:

```
SET POWER ON 2 4 3
```

where:

`2` is the HP APM port.

`4` is the SL APM Distribution Module port.

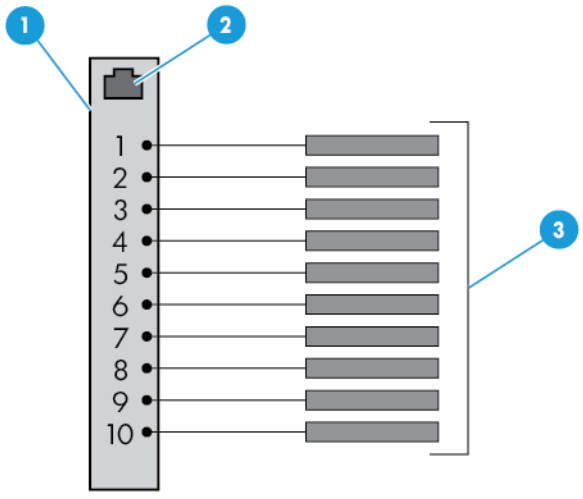
`3` is the SL server node.

Parameters must have spaces between them.

NOTE: HP APM considers the10 Consolidated Management Ports as RDM1.

Rack chassis numbering

If you must number the chassis in your rack or data center, then HP APM can display the chassis numbering, based on the HP APM Distribution Module port connection.



Item	Description
1	HP APM Distribution Module
2	HP APM connection

Item	Description
3	Connections to SL series enclosures

The HP APM commands `SHOW TOPOLOGY` and `SHOW RACK` displays the SL chassis connected with number, based on the HP APM port connection.

For example:

```
SHOW TOPOLOGY
1: SL enclosure
   Product Name :HP ProLiant SL6500
   Product SKU :
   Serial Number:
   UID :off
   Status :
      1 : Compute node (active)
      2 : Compute node (active)
      3 : Compute node (active)
      4 : Compute node (active)
      5 : Compute node (active)
      6 : Compute node (active)
      7 : Compute node (active)
      8 : Compute node (active)
2: SL enclosure
   Product Name :HP ProLiant SL6500
   Product SKU :
   Serial Number:
   UID :off
   Status :
      1 : Compute node (active)
      2 : Compute node (active)
      **
      **
3: SL enclosure
   Product Name :HP ProLiant SL6500
   Product SKU :
   Serial Number:
   UID :off
   Status :
      1 : Compute node (active)
      ****
```

Automatic discovery

HP APM employs an automatic discovery process that identifies all SL series servers in the attached enclosures.

The discovery process also has a simple fault detection mechanism. If any node has faults detected (for example, power supply failure), the discovery response data reports the fault. For a list of alert messages, see "Alert messages (on page 74)".

Installation and configuration

Prerequisites for installation

The HP APM can be administered through the serial console. Initial configuration requires a serial terminal set to 115200.

Preparing for installation

1. If you are not using a DHCP server, have your necessary IP address information available that will be used to access the HP APM.
2. Secure a serial terminal, which is required for the initial setup of the HP APM.
3. To use a remote logging server, verify that a remote syslog server and the IP address for connecting to the remote syslog server are available.

Installation guidelines:

- The HP APM can be installed in the front of the rack or in the rear of the rack. Always install the HP APM with the connectors facing the outside of the rack.
- If a top-of-the-rack switch is installed, HP recommends that you install the HP APM behind the top of the rack switch.

For more information on installing the HP APM, see the *HP Advanced Power Manager Installation Instructions* that accompany the option kit or see the HP website (http://www.hp.com/go/Apollo_6000/docs).

Configuring the HP APM for the first time

Both the serial and Ethernet devices on the HP APM provide access to the CLI. The CLI is the only mechanism provided for HP APM administration.

HP APM must be configured before SSH and Telnet administration is made available. Initial configuration of the HP APM requires a terminal set to 115200 bits/s, no parity, 8 data bits, and one stop bit (“115200 N 8 1”).

Configuring the HP APM

When you boot up, a `LOGIN` prompt appears. Enter `Administrator` as the user account:

```
Login: Administrator
```

You can initially configure the HP APM in the following ways:

- Enter `CONFIG` to use the simplified configuration wizard. The wizard provides you with a step-by-step process for configuring HP APM. This procedure is for new users.
- Enter the commands manually. This procedure is for advanced users who want more control over the configuration process.

- Duplicate the configuration. For more information, see "Duplicating the configuration (on page 23)."

Using the configuration wizard

When you enter `CONFIG`, you are prompted to complete the following tasks.

1. Set the onboard clock—If you select Y, you will be prompted for the following information:
   - Month—Enter a value between 1 to 12. Press **Enter**.
   - Day—Enter a value between 1 to 31. Press **Enter**.
   - Year—Enter the year (value must be four digits). Press **Enter**.
   - Hour—Enter a value between 0-23. Press **Enter**.
   - Minutes—Enter a value between 0-59. Press **Enter**.
2. Name the power manager—If you select **Y**, enter a name for the power manager. System names can be up to 80 characters. It can include uppercase letters, lowercase letters, underscores (_), dashes (-), and numerical values between 0-9. Dashes (-) are not supported as the first character. To save the power manager name, press **Enter**. Naming the HP APM is optional. This is the name that appears in log entries on the syslog server as well as the CLI prompt.
3. Enable password protection—HP APM has no default password. If you select **Y**, enter a password. The password must be between 8 and 40 characters, and can include:
   - uppercase letters
   - lowercase letters
   - underscores (_)
   - dashes (-)
   - at signs (@)
   - pound signs (#)
   - carets (^)
   - ampersands (&)
   - exclamation points (!)
   - plus symbols (+)
   - equal symbols (=)
   - tilde (~)
   - numerical values between 0–9

   To save and enable the password, press **Enter**. For more information about working with passwords, see "Working with passwords (on page 54)."
4. Configure the Ethernet port.
5. Use DHCP or static.
6. Enter an IP address if static. If the static IP address is invalid, DHCP is assumed.
7. Enter an IP address mask if static. If the IP address mask is invalid, DHCP is assumed.
8. Enable Telnet.
9. Enable SSH.
10. To review the enabled configuration before saving it, select **Y**.
11. Save the new configuration. To save the new configuration, select **Y**. All settings relating to the HP APM Ethernet and serial interfaces are persistent and stored in the HP APM.

Serial port configuration

Verify that the client matches the following settings:

- Baud rate—115200
- Data bits—8
- Stop bits—1
- Parity—None
- Flow control—None

To set a different serial baud rate, enter `SET SERIAL <BAUD_RATE>`, where `<BAUD_RATE>` is the baud rate setting to be used.

You must reboot before baud rate takes effect. You must change the settings on your client to match the settings on the HP APM.

Network configuration

The HP APM enclosure has two MAC address labels, one for each slot. The MAC address is slot-specific. You might need the MAC address when you configure the DHCP server to access HP APM. To view the MAC address, enter `SHOW INFO`. For more information, see "Showing configurations (on page 59)."

Setting a static IP address

To set a static IP address and subnet mask, enter `SET IP <ip_address> <subnet_mask>`, where `<ip_address>` is the IP address and `<subnet_mask>` is the subnet mask.

To return to DHCP, enter `SET IP DHCP`.

Setting the network default gateway

To set the network default gateway enter `SET GATEWAY <ip_address>`, where `<ip_address>` is the IP address. HP APM always uses the IP address, subnet mask, and default gateway.

To clear the gateway, enter `SET GATEWAY NONE`.

Showing the IP address

To show the IP address, enter `SHOW IP`. The following information appears:

- IP Address appears in x.x.x.x format
- IP Mask appears in x.x.x.x format
- Gateway appears in x.x.x.x format

Verifying network communication

To verify the network communication is working, enter `PING <IP address>`, where `<IP address>` is the IP address you want to test.

Security configuration

The network interface is disabled when password protection is removed. For more information about passwords, see "Working with passwords (on page 54)".

Protocol configuration

HP APM supports SSH and Telnet.

Working with SSH configuration

To enable SSH access, enter `ENABLE SSH`.

To disable SSH access, enter `DISABLE SSH`.

Working with the Telnet configuration

To enable Telnet access, enter `ENABLE TELNET`.

To disable Telnet, enter `DISABLE TELNET`.

Duplicating the configuration

Duplicating a configuration enables you to ensure consistency in configuring HP APM while saving time in the configuration process.

You can use the output from `SHOW CONFIG` to capture the current configuration of a HP APM and used as input to configure another HP APM. The password information is not duplicated because it is not part of the `SHOW CONFIG` output.

To duplicate the HP APM configuration:

1. Enter `SHOW CONFIG`.
2. To copy the configuration, copy the output of the `SHOW CONFIG` command to a file on your system using whatever methods are available in your terminal program.
3. To replicate the configuration, using the methods that are available in your terminal program, apply the previously saved `SHOW CONFIG` output as input to the new HP APM.

Command Line Interface

Command line conventions

CLI input is case insensitive except when otherwise noted. The CLI uses a simple, case insensitive verb noun "<target>" syntax.

Each command follows the conventions listed in the following table.

Symbol	Description
`<lower case>`	Denotes the variable within the symbols that must be substituted with a value, such as a user name. Symbols must be removed.
`UPPER CASE`	Denotes input to be entered as shown. Unless noted, symbol is not case-sensitive.
`|`	Used to separate input options.
`{ }`	Denotes a list of mandatory choices that you must make. For example, `SET GATEWAY {NONE | <ip_address>}` must be in the form of either of the following: • `SET GATEWAY NONE` • `SET GATEWAY <ip_address>`
`[ ]`	Denotes an optional argument or set of characters.
`" "`	Encloses command arguments that contain spaces.

Accessing the HP APM command line interface

You can access the HP APM through SSH, Telnet, or the serial port.

Accessing the HP APM through SSH

1. Using any SSH client application, start a SSH session to HP APM.
2. When prompted, enter the assigned IP address or FQDN of HP APM.
3. Enter `Administrator`.
4. Enter a valid password. The CLI command prompt appears.
5. Enter commands for HP APM.
6. To terminate the remote access SSH session, close the communication software or enter `EXIT`, `LOGOUT`, or `QUIT` at the CLI command prompt.

Accessing the HP APM through Telnet

1. Start a Telnet session to HP APM using any Telnet client application.

2. When prompted, enter the assigned IP address or FQDN name of HP APM.
3. Enter `Administrator`.
4. Enter a valid password. The CLI command prompt appears.
5. Enter commands for HP APM.
6. To terminate the remote access Telnet session, close the communication software or enter `EXIT`, `LOGOUT`, or `QUIT` at the CLI command prompt.

Accessing the HP APM through the serial port

You can also access the HP APM through the serial port. For more information, see "Serial Port Configuration (on page 22)."

Saving configurations

You must save your configurations. Otherwise, the configuration will be lost when you reset or reboot the HP APM.

To save a configuration, enter `SAVE`.

Topology and inventory

HP APM collects information from connected enclosures, including:

- SL enclosure product names
- SL enclosure product identifiers (SKU)
- SL enclosure serial numbers
- Node MAC addresses

To show this information using the previous configuration image as an example, use any of the following commands.

Showing the rack

To show the contents of the rack, enter `SHOW RACK`. The rack information appears, including the product name, product SKU, and product serial number of the chassis.

For example, the following text might appear:

```
APM-D4C9EFCB01CA> show rack
1: Display ports
    1: SL enclosure
       Product Name :HP ProLiant s6700
       Product SKU  :
       Serial Number:
       UID          :off
       Status       :
                      1 : Compute node (active)
                      2 : Compute node (active)
                      3 : Compute node (active)
                      4 : Compute node (active)
                      5 : Compute node (active)
```

```
                        6 : Compute node (active)
                        7 : Compute node (active)
                        8 : Compute node (active)
                        Power supply slot 1 is occupied, status good
                        Power supply slot 2 is occupied, status good
                        Power supply slot 3 is occupied, status good
                        Power supply slot 4 is empty
                        Fan slot 1 status good
                        Fan slot 2 status good
                        Fan slot 3 status good
                        Fan slot 4 status good
                        Fan slot 5 status good
                        Fan slot 6 status good
                        Fan slot 7 status good
                        Fan slot 8 status good

    2: (vacant)
    3: (vacant)
    4: (vacant)
    5: (vacant)
    6: (vacant)
    7: (vacant)
    8: (vacant)
    9: (vacant)
   10: (vacant)

2: Dist. Module
    1: SL enclosure
       Product Name :HP ProLiant s6500
       Product SKU  :
       Serial Number:
       UID          :off
       Status       :
                        1 : Compute node (active)
                        2 : Compute node (active)
                        3 : Compute node (active)
                        4 : Compute node (active)
                        5 : Compute node (active)
                        6 : Compute node (active)
                        7 : Compute node (active)
                        8 : Compute node (active)
                        Power supply slot 1 is occupied, status good
                        Power supply slot 2 is occupied, status good
                        Power supply slot 3 is occupied, status good
                        Power supply slot 4 is empty
                        Fan slot 1 status good
                        Fan slot 2 status good
                        Fan slot 3 status good
                        Fan slot 4 status good
                        Fan slot 5 status good
                        Fan slot 6 status good
                        Fan slot 7 status good
                        Fan slot 8 status good
    2: SL enclosure
       Product Name :HP ProLiant s6500
       Product SKU  :
       Serial Number:
       UID          :off
       Status       :
```

```
                        1 : Compute node (active)
                        2 : Compute node (active)
                        3 : Compute node (active)
                        4 : Compute node (active)
                        5 : Compute node (active)
                        6 : Compute node (active)
                        7 : Compute node (active)
                        8 : Compute node (active)
                        Power supply slot 1 is occupied, status good
                        Power supply slot 2 is occupied, status good
                        Power supply slot 3 is occupied, status good
                        Power supply slot 4 is empty
                        Fan slot 1 status good
                        Fan slot 2 status good
                        Fan slot 3 status good
                        Fan slot 4 status good
                        Fan slot 5 status good
                        Fan slot 6 status good
                        Fan slot 7 status good
                        Fan slot 8 status good
```

To show a particular rack, enter `SHOW RACK`, followed by either the HP APM port or both the HP APM and HP APM Distribution Module ports.

For example, enter:

```
SHOW RACK 2 4
```

The following example uses the power distribution module:

```
    > show rack pdm
    9: [PDM1] PDM Extension
        UID          : off
        Model        : Monitored PDU Ext. Bar
        Serial Number: 2CJ9410002
        Part Number  : AF529A
        Firmware Rev : 0.35
        Hardware Rev : HW_PV2
        Switched Outlets:
           1:
            UID    : off
            Enabled: yes
            Wattage: 092
           2:
            UID    : off
            Enabled: yes
            Wattage: 139
           3:
            UID    : off
            Enabled: yes
            Wattage: 011
           4:
            UID    : off
            Enabled: yes
            Wattage: 219
           5:
            UID    : off
            Enabled: yes
            Wattage: 050
    10: [PDM2] HP 60A PDU
        Model        : STI Serial TrueRMS PDU
```

```
Serial Number: ADFV0000083
Asset Tag    : SCI Lab PDU
Part Number  : QL192A
Firmware Rev : 1.0a
Switched Outlets:
   1: enabled
   2: enabled
   3: enabled
   4: enabled
   5: enabled
   6: enabled
Input Feeds:
   1:
    Amps Drawn          : 0.840000
    Infeed Status       : On
    Infeed Load Status  : Normal
   2:
    Amps Drawn          : 0.860000
    Infeed Status       : On
    Infeed Load Status  : Normal
   3:
    Amps Drawn          : 0.800000
    Infeed Status       : On
    Infeed Load Status  : Normal
   4:
    Amps Drawn          : 2.530000
    Infeed Status       : N/A
    Infeed Load Status  : Normal
```

This command produces the same results as the `SHOW SERVERS` and `SHOW TOPOLOGY` commands.

If you must number the chassis in your rack or data center, then HP APM can display the chassis numbering, based on the HP Advanced Power Manager Distribution Module port connection. For more information, see "Rack Chassis Numbering (on page 17)."

To show all the chassis and other devices connected to the HP APM, enter `SHOW RACK ALL`.

Showing the servers

To show the servers, enter `SHOW SERVERS`. The server information appears.

This command produces the same results as the `SHOW RACK` and `SHOW TOPOLOGY` commands.

Showing topology

To show the topology of everything that connects to the HP APM, enter `SHOW TOPOLOGY`. The topology appears.

This command produces the same results as the `SHOW RACK` and `SHOW SERVERS` commands.

If you must number the chassis in your rack or data center, then HP APM can display the chassis numbering, based on the HP APM Distribution Module port connection. For more information, see "Rack Chassis Numbering (on page 17)."

To show all the chassis and other devices connected to the HP APM, enter `SHOW TOPOLOGY ALL`.

Showing assetinfo

To list all the chassis in the rack in a report format, enter `SHOW ASSETINFO`.

For example, the following text might appear:

```
slapm> show assetinfo 1 7
1: Dist. Module
    7: SL enclosure
       Product Name :HP ProLiant s6500
       Product SKU  :629235-B21
       Serial Number:USE119A2MM
       UID          :off
       Status       :
                      1 : Compute node (active) Asset tag: myserver1
Serial #: USE119A2YW
                      2 : Compute node (active) Asset tag: myserver2
Serial #: USE119A2YT
                      3 : Compute node (active) Asset tag: myserver3
Serial #: USE119A319
                      4 : Compute node (active) Asset tag: myserver4
Serial #: USE119A31C
                      5 : Compute node (active) Asset tag: myserver5
Serial #: USE119A2N8
                      6 : Compute node (active) Asset tag: myserver6
Serial #: USE119A2N3
                      7 : Compute node (active) Asset tag: myserver7
Serial #: USE119A2N4
                      8 : Compute node (active) Asset tag: myserver8
Serial #: USE121AJYH
                      Power supply slot 1 is occupied, status good
                      Power supply slot 2 is occupied, status good
                      Power supply slot 3 is occupied, status good
                      Power supply slot 4 is occupied, status good
                      Fan slot 1 status good
                      Fan slot 2 status good
                      Fan slot 3 status good
                      Fan slot 4 status good
                      Fan slot 5 status good
                      Fan slot 6 status good
                      Fan slot 7 status good
                      Fan slot 8 status good
```

This command also requests and shows any asset tags from the chassis and any 30- or 60-amp PDUs that are in the rack.

The asset tag information for 30- or 60-amp PDUs can be set through the `SET ASSETINFO` command.

For example, the following text might appear:

```
> show assetinfo pdm2

10: [PDM2] HP 60A PDU
    Model         : STI Serial TrueRMS PDU
    Serial Number: ADFV0000083
    Asset Tag     : SCI Lab PDU
    Part Number   : QL192A
    Firmware Rev : 1.0a
    Switched Outlets:
       1: enabled
```

```
      2: enabled
      3: enabled
      4: enabled
      5: enabled
      6: enabled
   Input Feeds:
      1:
       Amps Drawn          : 0.860000
       Infeed Status       : On
       Infeed Load Status  : Normal
      2:
       Amps Drawn          : 0.870000
       Infeed Status       : On
       Infeed Load Status  : Normal
      3:
       Amps Drawn          : 0.830000
       Infeed Status       : On
       Infeed Load Status  : Normal
      4:
       Amps Drawn          : 2.590000
       Infeed Status       : On
       Infeed Load Status  : Normal
```

Showing the MAC address

To show the MAC address, enter `SHOW MACADDR`. The MAC address appears. The MAC address information appears following each module listing.

For example, the following text might appear on screen.

```
HP APM> show macaddr

1: Dist. Module
   1: SL enclosure
      Product Name :HP ProLiant s6500
      Product SKU  :
      Serial Number:
      UID          :off
      Status       :
                     1 : Compute node (active) Host MAC: D8:D3:85:AE:E7:03
                     2 : Compute node (active) Host MAC: 78:E7:D1:E4:6E:1F
                     3 : Compute node (active) Host MAC: 78:E7:D1:E4:6E:B9
                     4 : Compute node (active) Host MAC: 78:E7:D1:E4:6E:BD
                     5 : Compute node (active) Host MAC: D4:85:64:6A:52:2D
                     6 : Compute node (active) Host MAC: 1C:C1:DE:18:AC:F7
                     7 : Compute node (active) Host MAC: D4:85:64:6A:51:C3
                     8 : Compute node (active) Host MAC: D4:85:64:6A:52:6D
                     Power supply slot 1 is occupied, status good
                     Power supply slot 2 is occupied, status good
                     Power supply slot 3 is occupied, status good
                     Power supply slot 4 is occupied, status good
                     Fan slot 1 status good
                     Fan slot 2 status good
                     Fan slot 3 status good
                     Fan slot 4 status good
                     Fan slot 5 status good
                     Fan slot 6 status good
```

```
Fan slot 7 status good
Fan slot 8 status good
```

To show a particular MAC address, enter `SHOW MACADDR` and then the HP APM port or both the HP APM port and HP APM Distribution Module port.

For example, enter:

```
SHOW MACADDR 2 4
```

Logging

Overview of logging

Logging enables you to see the following information in HP APM:

- Actions taken
- Events
- Time when the action was taken or event occurred

HP APM has the following types of logs:

- Event logs, where HP APM records events
- Fault logs, where HP APM records internal errors. These internal errors create alerts in which the red LED illuminates. For a list of alert messages, see "Alert messages (on page 74)."

You can issue commands for both internal and external logging.

Use an external syslog server for:

- Redundant copy of events and logs
- Not limiting the events list to only the last 500 events

To ensure the correct time stamping in your logs, use the `SET TIME` command. For more information, see "Setting the time (on page 60)."

Internal logging

Internal logging tracks up to 100KB on the event log, up to 16KB on the fault log, and is persistent through reboot.

Showing and clearing the event log

To show the event log, enter `SHOW LOG`.

As an example, the following text might appear on screen:

```
> show log
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 2
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 3
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 4
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 5
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 6
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 7
```

```
Nov  6 11:51:25 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 3, slot 8
Nov  6 11:51:25 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 3, slot 1
Nov  6 11:51:25 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 3, slot 2
Nov  6 11:51:25 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 3, slot 3
Nov  6 11:51:25 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 3, slot 1 status is good
Nov  6 11:51:25 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 3, slot 2 status is good
Nov  6 11:51:25 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 3, slot 3 status is good
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 1
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 2
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 3
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 4
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 5
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 6
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 7
Nov  6 11:51:25 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
3, slot 8
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 1 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 2 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 3 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 4 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 5 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 6 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 7 status is OK
Nov  6 11:51:25 SLAPM system.0: Fan in chassis at Dist. Module #2, port 3,
slot 8 status is OK
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 1
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 2
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 3
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 4
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 5
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 6
```

```
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 7
Nov  6 11:51:26 SLAPM system.0: Server found in chassis at Dist. Module #2,
port 6, slot 8
Nov  6 11:51:26 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 6, slot 1
Nov  6 11:51:26 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 6, slot 2
Nov  6 11:51:26 SLAPM system.0: Power supply found in chassis at Dist. Module
#2, port 6, slot 3
Nov  6 11:51:26 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 6, slot 1 status is good
Nov  6 11:51:26 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 6, slot 2 status is good
Nov  6 11:51:26 SLAPM system.0: Power supply in chassis at Dist. Module #2,
port 6, slot 3 status is good
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 1
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 2
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 3
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 4
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 5
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 6
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 7
Nov  6 11:51:26 SLAPM system.0: Fan found in chassis at Dist. Module #2, port
6, slot 8
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 1 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 2 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 3 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 4 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 5 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 6 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 7 status is OK
Nov  6 11:51:26 SLAPM system.0: Fan in chassis at Dist. Module #2, port 6,
slot 8 status is OK
Nov  6 11:51:27 SLAPM system: Local user Administrator logged in
Nov  6 07:46:51 SLAPM Administrator: Ethernet interface enabled
Nov  6 07:47:00 SLAPM Administrator: Telnet interface enabled
Nov  6 07:47:00 SLAPM Administrator: ssh interface enabled
Nov  6 07:47:05 SLAPM Administrator: Configuration was saved
```

To clear the event log, enter `CLEAR LOG`.

Showing and clearing the fault log

To show the fault log, enter `SHOW FAULTS`.

As an example, the following text might appear on screen:

```
> show faults
May  4 19:43:43 APM-D4C9EFCB01CA system.0: Power Manager Power Supply 1 is
non operational
May  5 01:42:20 APM-D4C9EFCB01CA system.0: Timeout waiting for Dist. Module
mutex on Power Manager port 3
May  6 03:51:16 APM-D4C9EFCB01CA system: Failed login attempt with user
'Administrator' from 192.168.1.1
```

To clear the fault log, enter `CLEAR FAULTS`.

External logging

To show the syslog server address configuration information, enter `SHOW SYSLOG`.

To set the syslog server address configuration, enter `SET SYSLOG x.x.x.x`.

Using an existing syslog server provides:

- Redundant copy of events and logs
- No limits to number of events that can be logged

HP APM fault messages

Fault logged message	**Description**
There was an error transferring the file, image upgrade not performed	Error occurred during firmware upgrade.
Error upgrading firmware image	Firmware image not upgraded due to an error.
Distribution Module on Power Manager port X has excessive errors and has been marked as failed	RS-485 port is having excessive errors and has failed.
Distribution Module port X on Power Manager port Y has excessive errors and has been marked as failed	RS-485 port is having excessive errors and has failed.
Transmit failed to write	Hardware error transmitting a packet.
Read error on UART	Hardware error receiving a packet.
Power Manager Power supply 1 is non operational	Power supply in slot 1 is not supplying power to the HP APM chassis. There is a 20 second delay in detecting a power supply status change.
Power Manager Power supply 2 is non operational	Power supply in slot 2 is not supplying power to the HP APM chassis.
Firmware update to Distribution Module, port X failed, retry Y being attempted	While upgrading the firmware on a Power Manager Distribution Module, an error occurred. Retry being attempted.
Firmware update to Distribution Module, port X - all retries, failed, giving up	While upgrading the firmware on a Power Manager Distribution Module, too many errors occurred and the operation has been terminated.

Fault logged message	Description
Fans: • Power Manager Fan 2, failed • Both fans failed • One or more Fan rotor(s) failed • One or more Fan(s) failed • One or more Fan health status improved	Fans failed or removed. There is a 20 second delay in detecting a fan status change.
User config corruption detected, using backup copy.	The user configuration is corrupted, and HP APM is using the backup copy. Remove all accounts, and then add a new account and password.
User config settings lost due to corruption, please contact HP support.	The user configuration is corrupted, and the backup is corrupted as well. Remove all accounts and then add a new account and password.
Baseline config corruption detected, using backup copy.	There was a corruption on baseline config, and HP APM is using the backup copy. Use CLI command “Show power baseline” to determine if it’s still the correct baseline. If it is not, then remove the power cap, and if needed, use CLI command “Set power baseline."
Baseline config settings lost due to corruption, please contact HP support.	There is no power baseline set. Use CLI command “Set power baseline."
Key corruption detected, using backup copy.	There is an key corruption, and HP APM is using the backup copy. Use CLI command “Disable xml”, if it’s enabled, and shutdown all SSH sessions. Use CLI command “Reset keys.”
Power cap config corruption detected, using backup copy.	The power cap is corrupted, and HP APM is using the backup copy. Use CLI commands “Show power cap” and “Show power baseline” to verify that the power cap is in the set correctly. If not, use the CLI command “Set power baseline” and “Set power cap.”
Power cap config settings lost due to corruption, please contact HP support.	The power cap configuration is corrupted, and the backup is corrupted as well. Use CLI commands “Show power cap” and “Show power baseline” to verify that the power cap is in the set correctly. If not, use the CLI command “Set power baseline” and “Set power cap.”
Config corruption detected, using backup copy.	The configuration is corrupted, and HP APM is using the backup copy. Use CLI command “Config,” or set the individual config item and save again.
Config settings lost due to corruption, please contact HP support.	The configuration is corrupted, and the backup is corrupted as well. Use CLI command “Config,” or set the individual config item and save again.
Zone config corruption detected, using backup copy.	The zone configuration is corrupted, and HP APM is using the backup copy. Use CLI command “Show zones” and verify if the backup copy is sufficient. If not, add the zones as needed.
Zone config settings lost due to corruption, please contact HP support.	The zone configuration is corrupted, and the backup is corrupted as well. Use CLI command “Show zones” and verify if the backup copy is sufficient. If not, add the zones as needed.
Timeout waiting for chassis response.	The chassis failed to respond to the requested command.

XML-related fault messages

The following XML-related fault messages might appear in your fault log:

- Failed to allocate memory for XML parser.
- Failed to create a XML Output File for writing.
- Failed to create a XML Output.
- XML Rear Error

To attempt to resolve these error messages, first "Disable XML," and then "Enable XML" or "Enable XML Secure."

Working with RADIUS servers

The HP APM firmware supports the RADIUS authentication protocol. When RADIUS is enabled, it is used to verify login requests to HP APM through SSH, telnet, or the serial console.

Adding and removing a RADIUS server

To add a RADIUS server, enter `ADD RADIUS SERVER <ip_address> <shared_secret>`.

This command specifies an initial or additional RADIUS server to the HP APM list of authentication servers. The authentication proceeds in the same order that these servers were added to the configuration. Up to a total of five RADIUS servers can be added for authentication purposes. Port 1812 is assumed. The IP address must match the location of the RADIUS server. The shared secret must be specified in quotes and must match the string that has been programmed into the RADIUS server when receiving authentication requests from HP APM.

To set the number of times HP APM polls each of the RADIUS server indicated in the `ADD RADIUS SERVER` command, enter `SET RADIUS POLLNUM`. To set the number of seconds HP APM waits for a reply from the RADIUS server, enter `SET RADIUS POLLSEC`. These settings can only be set globally and cannot be applied to each individual RADIUS server.

To remove a RADIUS server, enter `REMOVE RADIUS SERVER <index>`.

This command removes a previously added RADIUS server that matches the index indicated with the `SHOW RADIUS` command. RADIUS authentication is no longer attempted against this server.

Enabling and disabling a RADIUS server

To enable HP APM as a RADIUS client, enter `ENABLE RADIUS`.

All login attempts through SSH, Telnet, and the serial console are authenticated through the list of RADIUS servers that were indicated with the `ADD RADIUS SERVER` command. Authentication is also verified against the local password if the RADIUS servers indicate no access.

To disable RADIUS authentication on HP APM, enter `DISABLE RADIUS`.

Authentication through RADIUS no longer takes place, but password checking is still done against the local password if that is still enabled. This command does not clear out the configured RADIUS servers.

Showing a RADIUS server

To show the currently configured RADIUS server, enter `SHOW RADIUS`.

To show the currently configured RADIUS parameter, use the `SHOW CONFIG` command.

Power capping

Power capping overview

HP Scalable System products, including HP ProLiant SL Series, HP Moonshot Series, and HP Apollo Series provide a power capping feature that operates at the server enclosure level. The capping feature can be activated using a stand-alone utility called PPIC.EXE that runs in the environment of one of the resident servers in the chassis to be power capped. After a power cap is set for the enclosure, all the resident servers in the enclosure will have the same uniform power cap applied to them until the cap is either modified or canceled.

With HP APM, the enclosure-level power capping feature can be expanded without the need to use the PPIC.EXE utility. A global power cap can be applied to all enclosures with one HP APM command, or different caps can be applied to user-defined groups by using flexible zones within the same rack.

NOTE: HP recommends configuring the HP APM so that it controls only one rack.

Power capping requirements

All nodes in the chassis must have iLO Scale Out or iLO Advanced License.

To support the HP APM power capping functionality, all tray nodes in the chassis must be rebooted after the chassis firmware has been updated, (for the s6500 chassis, the required version is v4.3 or higher) and the appropriate BIOS version has been flashed. A reboot is also required anytime you add iLO Scale Out or iLO Advanced License to the node. Upgrading to future versions of chassis firmware or HP APM firmware does not require a reboot of the node to support the power capping feature.

Power capping and measurement tolerance

The average chassis power level displayed by HP APM will not exceed 5% above the chassis power cap.

NOTE: The power baseline process is required for power capping functionality to work properly. All servers must be powered on and running an expected typical workload before starting the power baseline process. Because the baseline process will cap the servers briefly, performance will be impacted while power is measured and the baseline established.

As with any measurement system, variations in temperature, input power, and system loads will impact the accuracy of the power calculations. All power reading displayed by this utility will have a -/+ 5% tolerance. However, meter errors can be both positive and negative, so guardband for meter tolerance, as a percentage of the cap, can approach zero as the number of servers increases.

Invalidating a power baseline

Since power baselines are global, the HP APM monitors the domains for changes in server and power supply presence when a power baseline has been established. If a change occurs (for example, if a new server is

installed), then the HP APM detects this change and invalidates the current power baseline. This invalidation prevents any new caps from being set, but does not disable any existing caps that are set.

If a baseline has been invalidated due to changing hardware in the HP APM domain, then several options are available:

- If the change was caused by replacement of equipment (for example, a failed power supply was removed and a new one inserted) then you could restore the old baseline by resetting the HP APM and forcing it to re-read and re-compare the existing power baseline from the resident EEPROM.
- Always use the `SET POWER BASELINE` command to establish a new power baseline when the domain configuration changes because of one or more of the following changes:
  - SL Power Management Controller (SL Chassis) Firmware has been updated.
  - Add or remove the power supply.
  - Install or uninstall a new server or enclosure.
  - Add or remove memory from the tray.
  - Add or remove CPU from the tray.
  - Add or remove GPU from the tray.

Power capping licensing

All servers that are being power capped must have the iLO Scale Out or iLO Advanced License installed. Before a power baseline can be established, the HP APM verifies that all the servers housed in an SL enclosure have the advanced license pack installed. If any resident servers in the enclosure do not have the iLO\LO100 advanced license, the power baseline process ("Power baseline" on page 41), a prerequisite for power capping for the enclosure, is skipped.

HP APM and HP APM Distribution Module cabling

All supported SL enclosures and servers that are wired to the HP APM through one or more HP APM Distribution Modules can participate in power capping and monitoring. Separate power cap settings can be made for as many or as few of the enclosures as desired, but the power baseline process must operate as a global process that interacts with every supported enclosure that the HP APM is connected to through the HP APM distribution modules.

Rack level power capping

The rack level power cap is a power cap set at the HP APM level and, despite the name, can encompass a partial rack, a rack, or multiple racks. These domains are established by the reach of the HP APM and distribution module connections to the support SL enclosures combined with any optional zone definitions that may have been created. The term rack level power cap is used generically in this document to refer to any power cap that has been set at the HP APM level.

The power capping feature has two main processes to it. The first process establishes a power baseline. The second process sets a power cap against the previously established power baseline.

Power baseline

The power baseline is a calibration that indicates the range of how little power the chassis can consume at their maximum allowable power cap and how much power they can consume when completely uncapped. The minimum value is derived by capping the servers at their maximum internally allowable cap setting, running the enclosure fans up to 90% of capacity, and then measuring the power consumption of the chassis at the power supply level.

SL enclosures cannot be power calibrated by the HP APM if:

- All the servers that populate the chassis do not carry the iLO Scale Out or iLO Advanced license (empty slots are permitted).
- The chassis is using incompatible SL Power Management (SL Chassis) enclosure firmware prior to version 4.3.
- The server or enclosure hardware does not support the power capping feature.

If these checks are met (HP APM verifies these conditions for each chassis), then the power baseline process proceeds for that chassis. The baseline calibration process is run against every enclosure connected to the HP APM with the exceptions listed previously. Some enclosures might be baselined while others are not due to the previously listed reasons. After a power baseline is established for all enclosures, then the baseline is committed to the HP APM onboard EEPROM so that it becomes persistent when HP APM is reset during operation.

> **NOTE:** The power baseline process is required for power capping functionality to work properly. All servers must be powered on and running an expected typical workload before starting the power baseline process. Because the baseline process will cap the servers briefly, performance will be impacted while power is measured and the baseline established.

After established and saved in the EEPROM, the baseline data can be examined at any time using the `SHOW POWER BASELINE` command. For example:

```
> show power baseline

APMPort DMPort Serial Number Min Cap Max Cap Set Cap Slots    Populated
------- ------ ------------- ------- ------- ------- ----- ---------------

      1      2 CNK71600K4        585    2372    1500  (8)   2 3 5 7
                               ------- ------- -------
                                   585    2372    1500
```

If an HP APM has baseline data in its EEPROM and it is reset, HP APM re-reads that baseline data back into memory as it boots back up. After the subsequent device discovery, HP APM compares the baseline data in the EEPROM to the actual rack contents to ensure that they did not change while it was offline or that it was not relocated to another rack. The HP APM validates the following items from the saved baseline data in these instances:

- The chassis listed in the baseline is present.
- The chassis has the same populated server slots.
- If a power cap had been set, than it is the power cap currently set on the chassis.

If any of these do not match after a reset, then the HP APM logs an error to the log, indicating the mismatch in the baseline data, and the baseline data will be invalidated. However, it will not be erased from the EEPROM to provide you the chance to re-install any chassis or servers that invalidated the baseline data.

To remove baseline data from the EEPROM, use the `SET POWER BASELINE NONE` command. After this command is used, the only way to re-establish a power baseline is to use the `SET POWER BASELINE` command.

If a power cap is currently in place, the `SET POWER BASELINE NONE` command cannot be used. The power cap must first be removed (`SET POWER CAP NONE`), then the baseline can be removed.

If a power cap is currently in place and a `SET POWER BASELINE` command is issued, then any current power caps are removed in the calibration. New power caps can be established following the calibration process, assuming the new baseline data is saved to the EEPROM.

The following text is an example output when an advanced license is installed on all chassis:

```
> set power baseline
Before running a baseline calibration - ensure that
your configuration has all machines turned on and are
running processes that are typical of the type of workload
you expect them to run in a production environment.
This process will briefly impact the performance of the
servers that are being baseline calibrated as well as
temporarily speed up the fans.
Are you sure you wish to set a new power baseline for this system? (Y/N/Q)
-> Yes
Retrieving license information for chassis Power Manager port 1, Dist. Module
port 1
Verifying..done
Baselining power for servers located in chassis Power Manager port 1, Dist.
Module port 1
Calibrating.................done.
Minimum cap value for this chassis is 777
Maximum cap value for this chassis is 3558
```

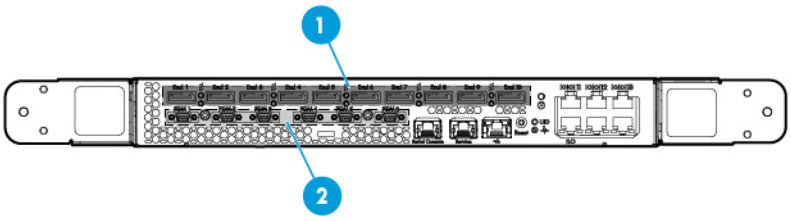
The following text is an example output when an advanced license was not installed on four chassis (1 1, 1 6, 1 7, and 1 10).

```
> set power baseline
Before running a baseline calibration - ensure that
your configuration has all machines turned on and are
running processes that are typical of the type of workload
you expect them to run in a production environment.
This process will briefly impact the performance of the
servers that are being baseline calibrated as well as
temporarily speed up the fans.
Are you sure you wish to set a new power baseline for this system? (Y/N/Q)
-> Yes
Retrieving license information for chassis Power Manager port 1, Dist. Module
port 1
Verifying..done
One or more servers located in chassis at Power Manager port 1, Dist. Module
port 1 is not licensed for the power capping feature.
This chassis will be skipped for baselining purposes.
Note:   All licensed servers should be booted up at least once
        so the BIOS/ROM can write the relevant license information
        to the chassis controller.
Retrieving license information for chassis Power Manager port 1, Dist. Module
port 2
Verifying..done
```

Setting power capping

Use the `SET POWER CAP` command to specify a power cap. The command takes an AC wattage range that must be between the minimum and maximum values that were set with the `SET POWER BASELINE` command and are shown with the `SHOW POWER BASELINE` command.

The following example illustrates the Consolidated Management Ports 1 through 10 (RDM1) and Power Distribution Module ports.




```
> show power baseline

APMPort DMPort Serial Number Min Cap Max Cap Set Cap Slots    Populated
------- ------ ------------- ------- ------- ------- ----- ----------------
      1      2 CNK71600K4        585    2372    1500  (8)  2 3 5 7
                               ------- ------- -------
                                   585    2372    1500
```

A power cap can be set between the minimum cap value of 585 and the maximum cap value of 2372. In this example, the cap applies only to the chassis located at APM Port 1, DM Port 2 because that is the only chassis that met the necessary prerequisites for power capping. Under circumstances with many chassis, the allowable cap range would fall between the total minimum and total maximum values.

Under normal circumstances, the average chassis power level might be up to 5% above the chassis power cap. However, the cap value might vary under extreme power usage situations.

When running the baseline calibration, the target system (all nodes in chassis) must be running at the production level load.

The following example shows mixed Power Management Controller (SL Chassis) Firmware version 4.3 and earlier:

```
> show power

MDM     Port     Node      Avg      Min      Max
----     ----     ----     -----    -----    -----
   1        1        1
   78     n/a      206    (DC watts)
   1        1        2       80     n/a      203    (DC watts)
   1        1        3       77     n/a      208    (DC watts)
   1        1        4       77     n/a      206    (DC watts)
   1        1        5       81     n/a      207    (DC watts)
   1        1        6       76     n/a      210    (DC watts)
   1        1        7       82     n/a      225    (DC watts)
   1        1        8       81     n/a      225    (DC watts)
   1        2    (no SL enclosure present)
   1        3        1      255     n/a      337    (DC watts)
```

```
   1       3       2      257    n/a      340   (DC watts)
   1       3       3      242    n/a      324   (DC watts)
   1       3       4      232    n/a      315   (DC watts)
   1       3       5      265    n/a      351   (DC watts)
   1       3       6      259    n/a      344   (DC watts)
   1       3       7      240    n/a      325   (DC watts)
   1       3       8      258    n/a      346   (DC watts)
   1       3    Fans       20                   (DC watts)
   1       3                                   2036 (Chassis total - DC watts)
   1       3                                   2151 (Chassis total - AC watts)
   1       3                                   2247 (Chassis cap   - AC
watts)
   1       4       1       91    n/a      188   (DC watts)
   1       4       2    (empty)
   1       4       3      115    n/a      186   (DC watts)
   1       4       4    (empty)
   1       4       5    (empty)
   1       4       6    (empty)
   1       4       7    (empty)
   1       4       8    (empty)
   1       4    Fans       14                   (DC watts)
   1       4                                    221 (Chassis total - DC watts)
   1       4                                    266 (Chassis total - AC watts)
   1       4                                    852 (Chassis cap   - AC
watts)
   1       5    (no SL enclosure present)
   1       6    (no SL enclosure present)
   1       7    (no SL enclosure present)
   1       8    (no SL enclosure present)
   1       9    (no SL enclosure present)
   1      10    (no SL enclosure present)
   2       1    (no SL enclosure present)
   2       2    (no SL enclosure present)
   2       3    (no SL enclosure present)
   2       4    (no SL enclosure present)
   2       5    (no SL enclosure present)
   2       6    (no SL enclosure present)
   2       7    (no SL enclosure present)
   2       8    (no SL enclosure present)
   2       9    (no SL enclosure present)
   2      10    (no SL enclosure present)
   3    (no Dist. Module present)
   4    (no Dist. Module present)
   5    (no Dist. Module present)
   6    (no Dist. Module present)
   7    (no Dist. Module present)
   8    (no Dist. Module present)

Total servers = 18
Total chassis = 3

PDM    Port    Load
----    ----    ----
   1       1      86 (AC watts)
   1       2     151 (AC watts)
   1       3       0 (AC watts)
   1       4     470 (AC watts)
   1       5      11 (AC watts)
   2    (no PDM Extension present)
```

```
                ----
                 718
```

The following example uses the power distribution module.

```
> show power pdm

PDM port 1
         PDM    Port    Load
        ----    ----    ----
           1       1      93 (AC watts)
           1       2     140 (AC watts)
           1       3      11 (AC watts)
           1       4     228 (AC watts)
           1       5      50 (AC watts)
                         ----
                          522
PDM port 2
        PDU:                STI Serial TrueRMS PDU
        Part Number:        QL192A
        Serial Number:      ADFV0000083
        Asset tag:          SCI Lab PDU
        Firmware rev:       1.0a
        Infeed Amps:        60
        Number of Infeeds: 4
        Switched Outlets:  6
        Infeeds:
                01: Amps drawn: 0.850000 Status: On Load: Normal
                02: Amps drawn: 0.880000 Status: On Load: Normal
                03: Amps drawn: 0.820000 Status: On Load: Normal
                04: Amps drawn: 2.560000 Status: N/A Load: Normal
        Switched ports:
                01: Enabled
                02: Enabled
                03: Enabled
                04: Enabled
                05: Enabled
                06: Enabled

> show power 1 3

MDM     Port    Node       Avg      Min      Max
----     ----    ----     -----    -----    -----
   1       3       1       254     n/a       337   (DC watts)
   1       3       2       255     n/a       340   (DC watts)
   1       3       3       244     n/a       324   (DC watts)
   1       3       4       233     n/a       315   (DC watts)
   1       3       5       265     n/a       351   (DC watts)
   1       3       6       258     n/a       344   (DC watts)
   1       3       7       238     n/a       325   (DC watts)
   1       3       8       259     n/a       346   (DC watts)
   1       3    Fans        20                     (DC watts)
   1       3                                      2033 (Chassis total - DC watts)
   1       3                                      2148 (Chassis total - AC watts)
   1       3                                      2247 (Chassis cap   - AC
watts)

Total servers = 8
Total chassis = 1
Total fan wattage    =   20 (DC watts)
```

```
Total system wattage = 2033 (DC watts)
Total system wattage = 2148 (AC watts)

> show power baseline

All values listed are in AC watts
APMPort DMPort Serial Number Min Cap Max Cap Set Cap Slots    Populated
------- ------ ------------- ------- ------- ------- ----- ---------------
      1      3 0000000000       2242    4744       0  (8)  1 2 3 4 5 6 7 8
      1      4                   845    4744       0  (8)  1 3
                               ------- ------- -------
                                  3087    9488       0

> show power

MDM    Port    Node      Avg     Min     Max
----    ----    ----    -----   -----   -----
   1       1    (no SL enclosure present)
   1       2    (no SL enclosure present)
   1       3       1      255    n/a      337   (DC watts)
   1       3       2      256    n/a      340   (DC watts)
   1       3       3      245    n/a      324   (DC watts)
   1       3       4      235    n/a      315   (DC watts)
   1       3       5      267    n/a      351   (DC watts)
   1       3       6      263    n/a      344   (DC watts)
   1       3       7      237    n/a      325   (DC watts)
   1       3       8      256    n/a      346   (DC watts)
   1       3    Fans       21                  (DC watts)
   1       3                                   2042 (Chassis total - DC watts)
   1       3                                   2157 (Chassis total - AC watts)
   1       3                                   2247 (Chassis cap   - AC
watts)
   1       4       1       92    n/a      188   (DC watts)
   1       4       2    (empty)
   1       4       3      115    n/a      186   (DC watts)
   1       4       4    (empty)
   1       4       5    (empty)
   1       4       6    (empty)
   1       4       7    (empty)
   1       4       8    (empty)
   1       4    Fans       14                  (DC watts)
   1       4                                    223 (Chassis total - DC watts)
   1       4                                    268 (Chassis total - AC watts)
   1       4                                    852 (Chassis cap   - AC
watts)
   1       5    (no SL enclosure present)
   1       6    (no SL enclosure present)
   1       7    (no SL enclosure present)
   1       8    (no SL enclosure present)
   1       9    (no SL enclosure present)
   1      10    (no SL enclosure present)
   2       1    (no SL enclosure present)
   2       2    (no SL enclosure present)
   2       3    (no SL enclosure present)
   2       4    (no SL enclosure present)
   2       5    (no SL enclosure present)
   2       6    (no SL enclosure present)
   2       7    (no SL enclosure present)
   2       8    (no SL enclosure present)
   2       9    (no SL enclosure present)
   2      10    (no SL enclosure present)
```

```
   3     (no Dist. Module present)
   4     (no Dist. Module present)
   5     (no Dist. Module present)
   6     (no Dist. Module present)
   7     (no Dist. Module present)
   8     (no Dist. Module present)

Total servers = 10
Total chassis = 2
Total fan wattage     =   35 (DC watts)
Total system wattage = 2265 (DC watts)
Total system wattage = 2425 (AC watts)

PDM     Port     Load
----     ----     ----
   1        1       87 (AC watts)
   1        2      150 (AC watts)
   1        3        0 (AC watts)
   1        4      464 (AC watts)
   1        5       11 (AC watts)
   2     (no PDM Extension present)
                  ----
                   712
```

In the following example, the cap is set to 1500 AC watts. This information is saved as part of the baseline data to the onboard HP APM EEPROM.

When multiple chassis are present and a valid rack level cap is given, HP APM:

1. Computes the total cap as a percentage against the sum of the eligible chassis' max power values.
2. For each chassis, multiplies the percentage computed in step 1 against each chassis individual max power value.
3. Programs the result into the chassis.
4. Repeats steps 2-3 for each eligible chassis.

To remove a power cap, use `SET POWER CAP NONE`. This action removes all power cap settings from all the servers.

Creating HP APM power mappings

Zones are collections of HP APM enclosures that can be given unique names that can be referred to for power capping purposes.

Zones provide the HP APM user with the capability of distinguishing groups of enclosures as targets for power or management operations. When zones are defined, they are strictly a boundary definition that is kept within the HP APM for its purposes. Zones can be added or removed with the `ADD ZONE` and `REMOVE ZONE` commands.

When the first ADD references a zone name that does not exist, the zone is automatically created and the indicated ports are populated into the newly created zone. Subsequent `ADD ZONE` commands that reference the same zone name cause the specified ports to be added to the existing zone. No limit exists for the number of ports other than the maximum HP APM supports in hardware that can be added to a zone. Multiple port listings can be used with a single `ADD ZONE` command, or multiple `ADD ZONE` commands can be used with each command adding new ports to the zone previously defined by the first `ADD ZONE` command.

To remove zone references to ports, use the `REMOVE ZONE` command. When the last port is removed from a zone, the zone is automatically deleted. A zone cannot exist where no ports are assigned to it, and zone port definitions cannot overlap (that is, the same SL chassis cannot exist in more than one zone).

Defining zones is an optional function, and is useful for applying power caps to some chassis while excluding others or applying different power caps to different groups or single SL chassis.

Since HP APM zones are merely definitions of user defined HP APM group boundaries (and by extension any chassis that are plugged into those ports), they ignore the actual physical presence of enclosures as they are being defined in the HP APM CLI. Empty HP APM ports can be included in a zone. If an enclosure is plugged into that port later, it automatically is part of that zone. A reminder message will be printed if a zone is mapped to a HP APM port that currently has no SL enclosure plugged into it.

After zone mappings have been completed with the `ADD ZONE` and `REMOVE ZONE` commands, the `SHOW ZONES` command can be used, for example:

```
> show zones

Zone RED:
        Power Manager port 1:
                Dist. Module port 1
Zone BLUE:
        Power Manager port 1:
                Dist. Module port 2
                Dist. Module port 3
Zone GREEN:
        Power Manager port 2:
                all Dist. Module ports included
Zone YELLOW:
        Power Manager port 3:
                Dist. Module port 1
>
```

After a zone mapping has been completed, it can be saved to the HP APM onboard EEPROM with the `SAVE ZONES` command. This action makes the zone definitions persistent across HP APM resets. It automatically reloads on reboot. If `SAVE ZONES` is not used, the zone data is lost if the HP APM is reset.

If a zone needs to be deleted, the `REMOVE ZONE <zone name> ALL` command can be used. This causes all ports to be removed from the zone definition, and the zone itself is deleted. As with all zone mapping modifications, to make it persistent across HP APM resets, enter `SAVE ZONES`.

Power capping with zones

If zones are defined as described above (and assuming a power baseline has been established for the rack), then the `SET POWER CAP` command can accept a zone name as a parameter after the wattage value (or `NONE` if a power cap is being removed).

For example:

```
> show zones

Zone BLUE:
        Power Manager port 1:
                Dist. Module port 2
                Dist. Module port 3
Zone GREEN:
        Power Manager port 2:
                all Dist. Module ports included
Zone YELLOW:
        Power Manager port 3:
                Dist. Module port 1

> show power baseline
```

```
APMPort DMPort Serial Number Min Cap Max Cap Set Cap Slots    Populated
------- ------ ------------- ------- ------- ------- ----- ----------------
      1      1                     0       0       0  (8)
      1      2 CNK71600K4        585    2372    1500  (8)  2 3 5 7
                               ------- ------- -------
                                   585    2372    1500

> set power cap 2000 blue

New cap represents 84 percent of the max cap of eligible entities.
Apply cap (Y/N) ->
```

The above output sets a power cap only to those chassis that are in the zone defined as BLUE. If all the caps must be removed from a zone, then SET POWER CAP NONE can be used.

```
> set power cap none blue

Remove power cap(s)? (Y/N) ->
```

The above command removes all power cap settings from the HP APM chassis that is resident in on the HP APM port 1 and distribution module ports 2 and 3, or zone blue. Since there is only a single chassis that matches that description, the operation only affects that one chassis.

If a cap is set using a zone, then the zone is removed, the cap is unaffected. A new zone may be created that includes some or all of the ports of the former zone and caps set against the new zone as well. Zones are strictly a defined set of SL enclosures that can be used to specify which machines are being considered for a cap. They are a vehicle for enabling multiple caps and/or "exclusion" areas to be created within a single HP APM domain of enclosures with respect to power capping.

Power baselines and zones

The power baseline cannot be created with respect to a zone. The baseline is a singular separate entity that is saved into the HP APM EEPROM. Zones can use portions of the established baseline when considering power caps, but the baseline is established globally.

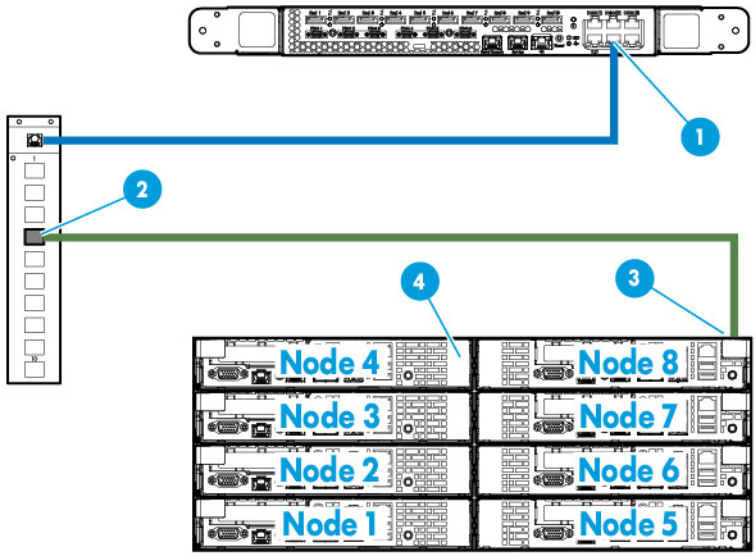
Power commands

NOTE: You must also have an HP ProLiant s6500 Chassis or later with BIOS support required.

The power commands use the HP APM port number, the distribution module port number, and server node port number as input parameters.

NOTE: HP APM considers the10 Consolidated Management Ports as RDM1.

In the following figure, the HP APM port 2 is connected to the HP APM Distribution Module port 4. The distribution module port is connected to the SL enclosure and server node 8.



Item	Description
1	HP APM
2	HP APM Distribution Module
3	SL series enclosure
4	Bay 4 of a 4U chassis SL6500 Scalable System enclosure with eight 1U half-width nodes

Displaying the rack power status

Enter `SHOW POWER`, and then optionally the specific HP APM port, or both the HP APM and the HP APM Distribution Module ports.

For example:

`SHOW POWER` (to show all power)

`SHOW POWER 2` (to show the power for the HP APM port number)

`SHOW POWER 2 4` (to show the power for the HP APM port number and the HP APM Distribution Module port number

This command also displays:

- Fan power per chassis in DC watts
- Chassis total in DC watts
- Chassis total in AC watts
- Chassis cap in AC watts (if one is set)
- The total of the averages is shown as well as the "average of averages" that was already there
- The average max power is shown as well as the total of the max column

- A total count of all the servers and chassis listed
- Total fan wattage for the listing
- Total system wattage in DC watts
- Total system wattage in AC watts

For example, the following text might appear on screen:

```
MDM     Port     Node      Avg     Min     Max
----     ----     ----     -----   -----   -----
1       (no Dist. Module present)
2       1       (no SL enclosure present)
   2        2        (no SL enclosure present)
   2        3      (no SL enclosure present)
   2        4        1       67     n/a      165    (DC watts)
   2        4        2        (empty)
   2        4        3       64     n/a      242    (DC watts)
   2        4        4        (empty)
   2        4        5        (empty)
   2        4        6        (empty)
   2        4        7        0     n/a      72    (DC watts)
   2        4        8        37   n/a      86    (DC watts)
   2        4     Fans       35                    (DC watts)
   2        4                                      203 (Chassis total - DC
watts)
   2        4                                      236 (Chassis total - AC
watts)
   2        5        1        (empty)
   2        5        2        94     n/a      94    (DC watts)
   2        5        3        64     n/a      179    (DC watts)
   2        5        4        (empty)
   2        5        5        74     n/a      169    (DC watts)
   2        5        6        (empty)
   2        5        7        0     n/a      0    (DC watts)
   2        5        8        (empty)
   2        5     Fans        235                    (DC watts)
   2        5                                       467 (Chassis total - DC
watts)
   2        5                                       507 (Chassis total - AC
watts)
   2        5                                       1500 (Chassis cap - AC
watts)
   2        6     (no SL enclosure present)
   2        7     (no SL enclosure present)
   2        8     (no SL enclosure present)
   2        9     (no SL enclosure present)
   2       10     (no SL enclosure present)
   3     (no Dist. Module present)
   4     (no Dist. Module present)
   5     (no Dist. Module present)
   6     (no Dist. Module present)
   7     (no Dist. Module present)
   8     (no Dist. Module present)
```

Setting power

Power management enables you to turn on and off single or multiple nodes within the rack.

To turn an SL server node on or off, use the `SET POWER` command:

```
SET POWER {ON|OFF|ENABLE|DISABLE} {ALL | <PORT#> <DMPORT#> {<NODE#>|ALL}}
```

where:

`ALL` is used when the command applies to all nodes. You can also use `ALL` when the command applies to all the server nodes in a particular SL server enclosure.

`<PORT#>` refers to the HP APM, PDM1, or PDM2 port numbers.

`<DMPORT#>` refers to the HP APM Distribution Module port number or the HP Intelligent Modular PDU Extension Bar outlet number.

`<NODE#>` refers to the SL server node.

For example, to power on SL server node 3, enter:

```
SET POWER ON 2 4 3
```

To power off SL server node 3, enter:

```
SET POWER DISABLE 2 4 3
```

When you power on a particular SL server enclosure, you must include either the node number or `ALL` in the command.

To power on the SL server nodes in the enclosure, enter:

```
SET POWER ON 2 4 ALL
```

To power on all nodes connecting to the chassis on all HP APM Distribution Module ports, enter:

```
SET POWER ON ALL
```

SNMP traps denoted by an asterisk (*) are not supported on the HP ProLiant s6500 Chassis. The `SET POWER ON ALL` and `SET POWER OFF ALL` commands are not supported on HP APM 1.54 on the HP Moonshot 1500 Chassis.

To power on the PDU ports, enter:

```
SET POWER ON PDM
```

To power off PDU ports, enter:

```
SET POWER OFF PDM
```

Polling servers for power values

To enable a background process that polls each server for its average, minimum, and maximum power values, enter `ENABLE POLLPOWER`.

Polling these values increases the performance of SNMP queries of these power values.

The poll cycle time varies depending on how many server chassis are plugged into the HP APM system. The more chassis that are present, the less frequently each server will be polled.

If POLLPOWER is enabled, then an SNMP request for any of these values on any resident server returns the last polled value instead of requesting the real time values from the server at the time the request is made.

Disabling the polling of servers for power values

To disable the background process that is polling each server for power usage, enter `DISABLE POLLPOWER`. The `DISABLE POLLPOWER` setting is the default.

General commands

Working with passwords

HP APM has a password recovery mechanism through the reset switch. If you press the reset switch for more than 5 seconds, the board reboots and proceeds in the password recovery mode. In the password recovery mode, the board boots up without asking for a password. All network interface is disabled.

HP APM has only one login account. This account is the “Administrator” account. If a password is assigned to the administrator account, the password is stored on the HP APM controller. If you move the controller to another HP APM enclosure, the password moves with the controller.

Configuring Ethernet requires a password.

Setting HP APM passwords

To set the password, enter `SET PASSWORD`.

You are prompted for a password when you access SSH, Telnet, or serial port access to the HP APM. You can have only one password for HP APM.

The password must be between 8 and 40 characters, and can include:

- Uppercase letters
- Lowercase letters
- Underscores (_)
- Dashes (-)
- At signs (@)
- Pound signs (#)
- Carets (^)
- Ampersands (&)
- Exclamation points (!)
- Plus symbols (+)
- Equal symbols (=)
- Tilde (~)
- Numerical values between 0–9

To save and enable the password, press **Enter**.

Alternatively, you can set the password by entering `SET PASSWORD <”password”>`. For example, enter the following:

```
SET PASSWORD "alphabravo"
```

When entering a password in this manner, you must include quotation marks around the password being set. This form of command is useful for scripted setup.

Disabling HP APM passwords

To disable the password, enter `DISABLE PASSWORD`.

This command disables the password protection feature. If the password is disabled, all network interfaces are also disabled.

Changing HP APM passwords

To change the password of the current user, enter `SET PASSWORD "<newpassword>"`. This command changes the password of the current user to `"<newpassword>"`.

To change the password of a specific user, enter `SET PASSWORD ACCOUNT "<user>" "<newpassword>"`. This command changes the password of the `"<user>"` to a `"<newpassword>"`.

NOTE: Only the Administrator can add or remove an account. You can change your own password, but only the Administrator can change another user's password.

Resetting factory settings for HP APM

To restore the HP APM to its factory default settings, enter `RESET FACTORY`.

This command restores HP APM to factory settings, including no password and Ethernet access, and then performs a reboot.

⚠ **WARNING:** When you enter `RESET FACTORY`, HP APM erases your entire configuration. Before resetting factory defaults, consider saving your configuration. For more information on duplicating your configuration, see "Duplicating the configuration (on page 23)".

NOTE: This command can only be run from the serial console.

Working with accounts

HP APM supports 11 login accounts (including the built-in Administrator account) on a single HP APM board. The account username must be between 2 to 32 characters. Valid characters are uppercase letters, lowercase letters, numbers (0-9), underscores (_) and dashes (-).

Adding an account

To add an account, enter `ADD ACCOUNT`. For example, enter

```
myslapm> add account "MyLogin123"
Password must be at least 8 characters
Note: password will not show.
Enter account "MyLogin123" password:
Enter account "MyLogin123" password (again):
Saving password..done.
```

```
Account MyLogin123 enabled
myslapm>
```

The account name must be between2-32 characters. If you attempt to use more than 32 characters, you will receive an error message:

```
myslapm> add account
"adkfjklsdjflsdjflsjflksdjfkljsdkljfklsdjfkljsdklfjsdljfklsdj"

Account name has invalid character or is reserved

Account name must be 2-32 characters

Valid characters are A-Z,a-z,0-9,_,and -.
```

After you enter this command with a valid new username, a prompt asking for a password appears. Enter the password. The new account is available for system login.

If you do not specify a password, and the username does not already exist, then you are prompted for a password.

All user accounts have the same permissions.

> **NOTE:** Login accounts and passwords are stored separate from the board configuration. A `SHOW CONFIG` command will not reveal any `ADD ACCOUNT` commands.

Removing an account

To remove an account, enter `REMOVE ACCOUNT "<username>"`

where:

`"<username>"` is the account username.

This command removes the specified account from the system. If the user does not exist, then an error message appears.

The Administrator account cannot be deleted.

Showing accounts

To show the existing defined accounts, including the reserved Administrator account, enter `SHOW ACCOUNTS`.

For example:

```
myslapm> show accounts
        Administrator
        root
myslapm>
```

Working with zones

HP APM enables the addition, removal, and showing of chassis to a zone, and the saving of zones.

Adding zones

To add one or more chassis to a zone, enter

```
ADD ZONE <zone_name> [[<PORT#> <DMPORT#>]] | [<PORT#> ALL] | [ALL]
```

where:

- `<zone_name>` is the zone name.
- `<PORT#>` is the port number.
- `<DMPORT#>` is the distribution module port number.
- `<PORT# ALL>` is the port number.

For example:

```
myslapm> add zone red 1 2
Zone RED does not exist, would you like to create it? (Y/N) -> Yes
Note: there currently is no physical chassis plugged into Power Manager port 1,
Dist. Module port 2
RED zone added
Zone definition changed, do you want to save this data to the EEPROM? (Y/N) ->
No
Note: You can also save zone data to the EEPROM at any time with the SAVE ZONES
command
myslapm>
```

If the zone does not already exist, then it will be automatically created and the specified chassis will be added.

You can create up to four zones.

The parameters enable the addition of all chassis on all HP APM ports, all the chassis plugged into an HP APM port through a HP APM Distribution Module) or a specific chassis on a specified HP APM port and HP APM Distribution Module port. The syntax is similar to other HP APM commands such as `SHOW POWER` or `SHOW RACK` in how HP APM and HP APM Distribution Module ports are specified.

When adding a chassis to a zone, the chassis does not have to be present and plugged into the HP APM. The HP APM issues a message in such cases, and therefore, the chassis does not exist. Zone definitions do not require the hardware to be actually present . For HP APM operations that might use zones (for example, `SET POWER BASELINE`), only those chassis that exist and are defined in the zone are considered for the operation.

For example:

```
ADD ZONE my_zone 1 5
```

Adds the chassis plugged into HP APM Distribution Module port 5 on HP APM port 1 to zone MY_ZONE. If MY_ZONE did not already exist, it will be created.

```
ADD ZONE my_zone 1 all
```

Adds all the chassis plugged into an HP APM Distribution Module on HP APM port 1.

```
ADD ZONE my_zone all
```

Adds all chassis on the HP APM to zone MY_ZONE.

```
ADD ZONE BLUE 1 ALL 2 ALL 3 1
```

You can also use ALL by itself instead of a PORT DMPORT pair.

For example:

```
ADD ZONE BLUE ALL
```

Zones cannot overlap.

Removing zones

To remove one or more chassis from a zone definition, enter

```
REMOVE ZONE <zone_name> [[<PORT#> <DMPORT#>]] | [<PORT#> ALL] | [ALL]
```

where:

- `<zone_name>` is the zone name.
- `<PORT#>` is the port number.
- `<DMPORT#>` is the distribution module port number.
- `<PORT# ALL>` is the port number.

If no more chassis exist in the zone after the target chassis is removed, then the zone is automatically deleted. The syntax for indication which chassis is to be removed is identical to the `ADD ZONE` command.

For example:

```
REMOVE ZONE my_zone ALL
```

Removes all chassis from the zone MY_ZONE. This command also deletes the zone definition of MY_ZONE because no chassis is associated with it.

```
REMOVE ZONE my_zone 1 ALL
```

Removes all chassis plugged into the HP APM Distribution Module on APM port 1.

Showing zones

To display all the currently defined zones and their respective member chassis, enter `SHOW ZONES`.

For example:

```
myslapm> show zones
Zone BLUE:
        Power Manager port 1:
                all Dist. Module ports included
Zone RED:
        Power Manager port 1:
                Dist. Module port 2
myslapm>
```

Saving zones

To commit the defined zones and their member chassis to the on-board EEPROM, enter `SAVE ZONES`.

You can define and save up to four zones. These zones are automatically loaded from the EEPROM when the board is reset.

Using password recovery

HP APM has a password recovery mechanism through the reset switch. If you press the reset switch for more than 5 seconds, the board reboots and proceeds in the password recovery mode. In the password recovery mode, the board boots up without asking for a password. All network interface is disabled.

Showing configurations

To show the configuration, enter `SHOW CONFIG`. A list of commands representing the configuration of HP APM appears.

Using the help

To access the help, enter `HELP`. The following listing appears:

```
APM-D4C9EFCB00B4> help
ADD             Add entity
CLEAR           Empty log entries
CLOSE           Close rack's doors
CONFIG          Configure HP APM
CONNECT         Connect board peripherals
CONTROLLER      Rack controller controls
DISABLE         Turn off board features
ENABLE          Turn on board features
EXIT            Exit CLI
HELP            Show help messages
LOGOUT          Exit CLI
OPEN            Open rack's doors
QUIT            Exit CLI
PING            Ping a remote host
REBOOT          Reboot firmware
REMOVE          Remove entity
RESET           Reset HP APM
SAVE            Save HP APM config or zones
SET             Set board configuration
SHOW            Display information
TEST            Test commands
UPGRADE         Pull in new firmware
```

Each listing has its own listings. For example, when `HELP CLEAR` is entered, the following appears:

```
HP APM> help clear

        CLEAR           Empty log entries
        FAULTS          Empty the fault log
        LOG             Empty system log
        SCREEN          Clear the screen
```

This listing shows the items that you can clear:

- To empty the fault log, enter `CLEAR FAULTS`.
- To empty the system log, enter `CLEAR LOG`.
- To clear the screen, enter `CLEAR SCREEN`.

Setting the name

To set the name that appears in the log and syslog entries, enter `SET NAME "<name>"`. For example:

```
SET NAME "alphabravo"
```

System names can be up to 80 characters, and can include uppercase letters, lowercase letters, underscores (_), dashes (-), and numerical values between 0-9. Dashes (-) are not supported as the first character. To save

the power manager name, press Enter. Naming the HP APM is optional. This is the name that appears in log entries on the syslog server as well as the CLI prompt.

Setting the time

To set the time, enter SET TIME <month> <day> <year> <hour> <minute>

where:

- <month> is the month.
- <day> is the day.
- <year> is the year.
- <hour> is the hour, in 24-hour format. For example, enter 3:00 p.m. as 15.
- <minute> is the minute.

HP APM does not automatically adjust for Daylight Savings Time.

The time remains on this setting until you issue the RESET FACTORY command.

Setting the session timeout

To set the SSH and Telnet inactivity timeout, enter SET TIMEOUT {<timeout_value> | NONE}

where <timeout_value> is the timeout value measured in seconds.

For example, to set a 30-second timeout, enter:

```
SET TIMEOUT 30
```

If you specify NONE, then no timeouts are set. For example, enter:

```
SET TIMEOUT NONE
```

The timeout values are in increments of 5 seconds. The minimum timeout value is 15 seconds and the maximum timeout value is 21,600 seconds (6 hours).

Setting the UID LED

To activate the UID LED, enter SET UID ON.

To deactivate the UID LED, enter SET UID OFF.

If there is a parameter specified such as <PORT#> <DMPORT#>, the UID of the chassis is turned on/off.

Showing information

To show information, enter SHOW INFO. The following information appears:

- Manufacturer
- Product Name
- Part Number
- Spare Part Number

- Serial Number
- FRU File ID

The power manager is the bottom board, and the connector module is the top board that has all the display port connections.

For example, the following text appears:

```
 APM-D4C9EFCB01CA> show info
Power Manager
------------
        Manufacturer:                   HP
        Product Name:                   HP RACK MANAGER
        Part Number:                    000000-000
        Spare Part Number:              735178-001
        Serial Number:                  1234567890ABCD
        Chassis Part Number:            730917-001
        Chassis Serial Number:          1234567890
        FRU File Id:                    05/29/13
        MAC Address 1:                  D4:C9:EF:CB:01:CA (stored in
chassis)
        MAC Address 2:                  D4:C9:EF:CB:01:00 (stored in
chassis)
Connector Module
------------
        Manufacturer:                   HP
        Product Name:                   HP APM BOARD
        Part Number:                    741191-B21
        Serial Number:                  PDUUCX2TM5G00T
        Chassis Part Number:            739945-001
        Chassis Serial Number:          1234567890
        Power Brick Part Number:        747059-001
        Fan Part Number:                747410-001
        FRU File Id:                    09/03/13
```

Showing the name

To show the name, enter `SHOW NAME`. The name appears.

For example, the following text appears on the screen:

```
HP APM> show name
HP APM
```

Showing the time

To show the time, enter `SHOW TIME`. The time appears.

For example, the following text appears:

```
HP APM> show time
MON OCT 1 12:56:21 2012
```

Showing the version

To show the version, enter `SHOW VERSION`. The version information appears.

For example, the following text appears:

```
APM-D4C9EFCB00B4> show version

HP Advanced Power Manager
(c) Copyright 2014 Hewlett-Packard Development Company, L.P.
All rights reserved
Version 2.00
Build time was Apr 21 2014, 11:58:04
```

To show the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures, enter `SHOW VERSION ALL`.

Rebooting and resetting factory settings

To reboot, enter `REBOOT`. Unsaved configuration settings are lost.

Rebooting the HP Moonshot 1500 Chassis CM module

To reboot the HP Moonshot 1500 Chassis CM module, enter `REBOOT CM <PORT#> <DMPORT #>`.

where:

`<PORT#>` refers to the HP APM port.

`<DMPORT#>` refers to the HP APM Distribution Module port.

Performing a reset

To reset, enter `RESET`. Unsaved configuration settings are lost.

Performing a reset buddy

To reset or reboot the other HP APM module (the Buddy, if connected), enter `RESET BUDDY`.

For more information, see the redundant reset in "HP APM rear view (on page 11)."

Clearing the screen

To clear the session screen, `CLEAR SCREEN`.

Resetting factory settings

NOTE: This command can only be run from the serial console.

To reset the factory settings, enter `RESET FACTORY`.

All configuration and password settings will be lost. Password access will be disabled. Network access will be prevented due to disabled password.

Exiting, logging out, or quitting HP APM

To exit enter one of the following: `EXIT, LOGOUT,` enter `QUIT`.

Connecting and setting ports

To connect the current CLI session to the specified serial port, enter `CONNECT PORT`.

To configure a single or all serial ports, enter `SET PORT`.

Ports 1 through 10 refer to the display ports, and 11 and 12 refer to the serial ports.

This is an example of setting port to 115200 baud rate with 8N1:

```
myslapm> set port 1 115200 8N1
Serial Port 1 set to 115200 bps, 8N1
```

This is an example of setting all ports to 115200 baud rate with 8N1:

```
myslapm> set port all 115200 8N1
Serial Port 1 set to 115200 bps, 8N1
Serial Port 2 set to 115200 bps, 8N1
Serial Port 3 set to 115200 bps, 8N1
Serial Port 4 set to 115200 bps, 8N1
Serial Port 5 set to 115200 bps, 8N1
Serial Port 6 set to 115200 bps, 8N1
Serial Port 7 set to 115200 bps, 8N1
Serial Port 8 set to 115200 bps, 8N1
Serial Port 9 set to 115200 bps, 8N1
Serial Port 10 set to 115200 bps, 8N1
Serial Port 11 set to 115200 bps, 8N1
Serial Port 12 set to 115200 bps, 8N1
```

Using SNMP

SNMP overview

The architectural model for SNMP contains these components:

- At least one network management station with manager software. A network management station is a host running an application that manages the network. The network management applications request information from the agents, put the information into a database, and then translate messages into a readable format.
- Network Agents. Network agents are managed devices containing agent software. Agents might be hosts, gateway systems, or media devices such as bridges, hubs, or multiplexors. These agents perform the network management functions requested by the network management stations.
- Network management protocol. SNMP enables network management stations to monitor and control network devices. Stations and agents use SNMP to exchange management information. SNMP describes how agents and managers communicate and defines the types of information that can be exchanged.

Enabling SNMP

To enable the SNMP protocol stack and agent in HP APM, enter `ENABLE SNMP`.

To disable the SNMP protocol stack and agent, enter `DISABLE SNMP`.

When you enter `DISABLE SNMP`, HP APM no longer responds to SNMP. This state is the default.

Displaying SNMP parameters

Enter `SHOW SNMP`.

As an example, the following text might appear on screen:

```
> show snmp
SNMP agent is enabled

SNMP Read-only community string is "public"
SNMP Read-write community string is "private"

SNMP traps are sent to 16.83.185.73

SNMP system group values:
        SysDescription: HP SL Advanced Power Manager
        sysUptime:      33658723
        sysContact:
        sysName:        alphabravo
        sysLocation:    Chicago
```

If you do not have a particular variable entered, the space for that variable is left blank. In this example, no contact information has been entered.

Setting the SNMP read-only community string

To set the SNMP read-only community string, enter `SET SNMP RO "<community_string>"`. For example, enter:

```
SET SNMP RO "alphabravo"
```

Setting the SNMP read-write community string

To set the SNMP read-write community string, enter `SET SNMP RW "<community_string>"`. For example, enter:

```
SET SNMP RW "alphabravo"
```

Setting the SNMP contact

To set the `sysContact` field, enter `SET SNMP CONTACT "<sysContact>"`. For example, enter:

```
SET SNMP CONTACT "alphabravo"
```

Setting the SNMP location

To set the `sysLocation` field, enter `SET SNMP LOCATION "<sysLocation>"`. For example, enter:

```
SET SNMP LOCATION "alphabravo"
```

Setting SNMP trap destinations

To set the IP address for SNMP traps, enter `SET SNMP TRAPDEST <<ip_addresses>|NONE>`. For example, enter:

```
SET SNMP TRAPDEST x.x.x.x
```

You can set up to four SNMP traps at once. For example, enter:

```
SET SNMP TRAPDEST x.x.x.x y.y.y.y z.z.z.z a.a.a.a
```

If you specify `NONE`, then no traps are set. For example, enter:

```
SET SNMP TRAPDEST NONE
```

HP APM supports the following SNMP traps:

- cpqRackNameChanged
- cpqRackEnclosureRemoved
- cpqRackEnclosureInserted
- cpqRackEnclosureFanRemoved *
- cpqRackEnclosureFanInserted *
- cpqRackEnclosureFanFailed
- cpqRackEnclosureFanOK
- cpqRackPowerSupplyFailed

- cpqRackPowerSupplyOK
- cpqRackPowerSupplyRemoved
- cpqRackPowerSupplyInserted
- cpqRackServerBladeRemoved
- cpqRackServerBladeInserted

  * Not supported on HP ProLiant s6500 Chassis

SNMP support of cpqHoSwRunningTable

The first element of this SNMP table lists the HP APM base firmware itself under cpqHoSwRunningName and cpqHoSwRunningDesc with cpqHoSwRunningVersion listing the correct version of the HP APM firmware.

The following components are listed in the cpqHoSwRunningTable:

- SNMP
- SSH
- syslogd
- Telnet

The table entry cpqHoSWRunningState is set to either Running (2) or Stopped (3) to reflect whether that service is enabled or not. The SNMP service is listed as "Running" when accessed through this MIB item.

All other items in this table are unsupported and will return their respective static return value for “unknown.”

The rows appear in this order:

- HP APM base firmware
- Telnet
- SSH
- SNMP
- syslogd

The following figure shows a sample table view of cpqHoSwRunningTable.

	1	2	3	4	5
cpqHoSWRunningIndex	1	2	3	4	5
cpqHoSWRunningName	SL-APM	telnet	ssh	snmp	syslogd
cpqHoSWRunningDesc	HP ProLiant SL Advanced Power Manager	Telnet server	ssh daemon	snmp agent	syslog daemon
cpqHoSWRunningVersion	Version 1.20				
cpqHoSWRunningDate					
cpqHoSWRunningMonitor	other	other	other	other	other
cpqHoSWRunningState	other	started	started	started	stopped
cpqHoSWRunningCount	1	1	1	1	1
cpqHoSWRunningCountMin	1	1	1	1	1
cpqHoSWRunningCountMax	1	1	1	1	1
cpqHoSWRunningEventTime					
cpqHoSWRunningStatus	unknown	unknown	unknown	unknown	unknown
cpqHoSWRunningConfigStatus	unknown	unknown	unknown	unknown	unknown
cpqHoSWRunningIdentifier					
cpqHoSWRunningRedundancyMode	unknown	unknown	unknown	unknown	unknown

Using XML

XML overview

XML scripting provides a standard programmatic means for data center tools to interact with the HP APM. You can configure many of the same components available with the HP APM CLI only in a format that is more favorable to the many tools that use XML as a scripting medium.

In addition to configuration capabilities, you can also draw information from the HP APM, based on an XML query/response paradigm, such as querying a rack for all available power loads on that rack.

A username/password combination, located at the top of the XML query into HP APM, enforces security.

XML headers

The first line of the XML script is always the following:

```
<?xml version="1.0" encoding="UTF-8"?>
```

XML output

XML output normalizes the attribute values and writes them to the output. This output follows the W3C canonicalization specification (http://www.w3.org/TR/xml-c14n).

Data types

The following table lists the data types allowed in the parameter.

Data type	**Description**
String	Any text enclosed in quotes. It can include spaces, numbers, or any printable character. A string might start with either a double of single quote, and it must end with the same type of quote. The string might contain a quote if it is different from the string delimiter quotes. For example, if a string is started with a double quote, a single quote can be used within the string and the string must be closed with a double quote.
Specific string	A specific string must contain certain characters. You have a choice of words that are accepted as correct syntax. All other words produce an error.
Boolean string	A boolean string is a specific string that specifies a "yes" or "no" condition. These strings are not case-sensitive. Acceptable boolean strings are: • "yes" • "y" • "no" • "n" • "true" • "t" • "false" • "f"

Response definitions

Every command sent to HP APM generates a response. The response tells whether the command succeeded or failed. Some commands generate additional information. The additional information appears in execution sequence, provided that no errors occurred.

For example, a successful response might appear as follows:

```
<RESPONSE
STATUS="0x0000"
MSG="No Error."
> </RESPONSE>
```

A fail response might appear as follows:

```
<RESPONSE
STATUS="0x0001"
MSG="There has been an error."
> </RESPONSE>
```

Response

The tag name indicates that the HP APM is sending a response to the previous commands back to the client application. This response indicates the success or failure of the commands that have been sent to the HP APM. If an error occurs, the execution stops and the commands that follow it will not be executed. Prior commands will have been executed up to the point where the error occurred.

Status

The status parameter contains an error number. The number 0x0000 indicates that no error occurred.

Status code	**Possible reason**
0x0000	No error.
0x0001	General error.
0x0002	Invalid or missing XML header. Every XML must start with SLAMPCL.
0x0003	Login failed. Wrong username/password.
0x0004	Unknown/unsupported Name Tag that is supported by the HP APM. Mismatch Tag. The hierarchy or syntax that HP APM might be incorrect.
0x0005	Parsing error to invalid XML (syntax error). For example, every begin tag must have an end tag. End tags must not have duplicate attribute values.
0x0006	Unknown attribute for an element tag specified.
0x0007	Required attribute for an element tag specified is missing.
0x0008	The attribute values are missing or have errors.
0x0009	Device specified message error. For example, the device is not present. Device is already on.
0x000A	The value cannot be blank.
0x000B	The required children tag is missing.

MSG

This element contains a message describing the error that occurred. If no error occurred, the message `No error` appears. Depending on the XML information sent, the element might return more than one error.

For example, giving an invalid XML and an incorrect username/password generates two error messages.

Enabling XML

To enable the XML interface and make XML queries available on the network using port 80 (HTTP), enter `ENABLE XML`.

To enable the XML interface and make XML queries available on the network using port 443 (HTTPS), enter `ENABLE XML SECURE`.

The `ENABLE XML SECURE` command uses the OpenSSL Library for encryption. You can enable XML, or enable XML secure, but you cannot enable both concurrently.

To disable the XML interface, enter `DISABLE XML`.

Showing and resetting keys

To show the current SSL certificate, enter `SHOW KEYS`.

To regenerate a new DSA key, a new RSA key, and generate a new SSL certificate, enter `RESET KEYS`.

Logging in through XML

The `LOGIN` command provides information used to authenticate the user whose permission level will be used when performing HP APM XML actions. The user must have a valid account on the respective HP APM to execute commands.

For example:

```
<LOGIN USER_LOGIN="username" PASSWORD="password">
</LOGIN>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case-sensitive and must never be blank.

`PASSWORD` is the password associated with the user. This parameter is case-sensitive and can be a combination of any printable characters.

Modifying the user account

The `MOD_USER` command enables you to modify an existing local user account.

The `USER_LOGIN` parameter must exist in the current user database. For this command to parse correctly, the command must appear within a `USER_INFO` command block.

Currently, this command only supports changing the administrator password.

For example:

```
<SLAPMCL VERSION="2.00">
```

```
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<USER_INFO>
<MOD_USER USER_LOGIN="Administrator">
<PASSWORD VALUE="newpassword"/>
</MOD_USER>
</USER_INFO>
</LOGIN>
</SLAPMCL>
```

Requesting information with XML commands

You can request the firmware version, rack topology, and rack information with XML commands.

Requesting firmware version

To request the firmware information, enter <GET_FW_VERSION>.

For example:

```
<SLAPMCL VERSION="1.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_FW_VERSION/>
</LOGIN>
</SLAPMCL>
```

Requesting rack topology

To request a return of the current topology of a rack infrastructure, enter <GET_RACK_TOPOLOGY>.

For example:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_RACK_TOPOLOGY/>
</LOGIN>
</SLAPMCL>
```

Requesting rack information

To request information about a rack infrastructure, enter <GET_RACK_INFO>.

For example:

```
<SLAPMCL VERSION="1.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_RACK_INFO/>
</LOGIN>
</SLAPMCL>
```

Modifying compute node power

To request SL Power Management Controller, or turn a node on or off, enter <MOD_COMPUTE_NODE_POWER>.

For example:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
```

```
<MOD_COMPUTE_NODE_POWER>
<SLAPM PORT=”1”/>
<DIST_MODULE PORT=”1”/>
<NODE PORT=”1”/>
<STATUS VALUE=”ON”/>
</MOD_COMPUTE_NODE_POWER>
</LOGIN>
</SLAPMCL>
```

To request SL Power Management Controller to turn on all nodes attached to HP APM, enter `<MOD_ALL_COMPUTE_NODES_POWER_VALUE="ON"/>`.

For example, to turn on all nodes:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<MOD_ALL_COMPUTE_NODES_POWER_VALUE="ON"/>
</LOGIN>
</SLAPMCL>
```

To request SL Power Management Controller to turn off all nodes attached to HP APM, enter `<MOD_ALL_COMPUTE_NODES_POWER_VALUE="OFF"/>`.

For example, to turn off all nodes:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<MOD_ALL_COMPUTE_NODES_POWER_VALUE="OFF"/>
</LOGIN>
</SLAPMCL>
```

Requesting compute power node status

To request the power status of a node, enter `<GET_COMPUTE_NODE_POWER>`.

For example:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_COMPUTE_NODE_POWER>
<SLAPM PORT=”1”/>
<DIST_MODULE PORT=”1”/>
<NODE PORT=”1”/>
</GET_COMPUTE_NODE_POWER>
</LOGIN>
</SLAPMCL>
```

To request the power status of all nodes attached to HP APM, enter `<GET_ALL_COMPUTE_NODES_POWER/>`.

For example:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_ALL_COMPUTE_NODES_POWER/>
</LOGIN>
</SLAPMCL>
```

Resetting HP APM

To reset HP APM, enter `<RESET_APM>`.

For example:

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<RESET_APM/>
</LOGIN>
</SLAPMCL>
```

Firmware

Upgrading the firmware

You can perform firmware upgrades using either FTP or TFTP.

To perform an upgrade:

1. Place the firmware image file onto a system that provides an FTP or TFTP server and is accessible from the HP APM network.
2. Log in to the HP APM CLI interface using a serial port, Telnet, or SSH connection.
3. Depending on which protocol you choose, enter either of the following commands:.
   - `UPGRADE IMAGE FTP <ip_address> <"login_name"> <"password"> <"filename">`
   - `UPGRADE IMAGE TFTP <ip_address> <"filename">`

   where:
   - `<ip_address>` refers to the IP address of a server that contains the file to be transferred.
   - `<"login_name">` refers to the FTP user name on the server hosting the file.
   - `<"password">` refers to the password of the FTP user name.
   - `<"filename">` refers to the file to be transferred. To preserve case, enclose `<filename>` in quotes.

The login name, password, and filename must be in quotations. For example,

```
UPGRADE IMAGE FTP x.x.x.x "username" "alphabravo" "filename.bin"
```

Following the transfer, the HP APM is automatically upgraded and reset to run the new image.

IMPORTANT: If an upgrade is performed using either a Telnet or a SSH, the connection to the HP APM will be lost after the upgrade.

IMPORTANT: If the firmware upgrade process is interrupted, then HP APM reverts to the factory default image.

NOTE: If you downgrade the firmware or a firmware recovery is performed, syntax error messages might appear as the module initializes with its previously-saved configuration. You can ignore these messages.

Troubleshooting

Alert messages

The following messages appear in HP APM.

Message	Where this issue occurs	Required action
`There was an error transferring the file, image upgrade not performed.`	Firmware upgrade	Verify network connectivity, and then retry the firmware upgrade.
`Error upgrading firmware image.`	Firmware upgrade	Message appears with other logs describing the actual issue. Review logs to identify, and then resolve issue.
`Dist. Module on Power Manager Chassis port <#> has excessive errors and has been marked as failed.`	All modes of operation	Verify HP APM and HP APM Distribution Module cabling.
`Power Manager Chassis port <#> on Dist. Module <#> has excessive errors and has been marked as failed.`	All modes of operation	Verify HP APM and HP APM Distribution Module cabling.
`Power Manager Chassis rendered non functional, redundant Power Manager Chassis is not supported by this firmware version.`	Redundant HP APM inserted into HP APM enclosure	Remove both HP APM controllers, and then reinsert only one controller.
`The SL enclosure on Power Manager port <#>, Dist. Module port <#> does not support the Power Manager.`	SL Power Management Controller at the named location does not support HP APM.	Update the SL Power Management Controller in that chassis. If no update is available, the SL Power Management Controller does not offer support for HP APM.

For messages not listed, contact HP Support (http://www.hp.com/support). For more information, see "Support and other resources (on page 112)."

Devices not discovered

If devices are not discovered, perform the following steps:

1. Check the link and power LEDs.
2. Check the cables.
3. Reboot HP APM.

CLI commands

Clear faults

- **Command:**

  `CLEAR FAULTS`

- **Description:**

  Clears the fault log to have 0 entries.

Clear log

- **Command:**

  `CLEAR LOG`

- **Description:**

  Clears all previous event logs.

Clear screen

- **Command:**

  `CLEAR SCREEN`

- **Description:**

  Clears a VT100/ANSI compatible terminal of all characters. Places cursor at position 1,1.

Disable Ethernet

NOTE: This command can only be run from the serial console.

- **Command:**

  `DISABLE ETHERNET`

- **Description:**

  Disables network access, including SSH and Telnet access and remote syslog support.

Enable Ethernet

- **Command:**

  `ENABLE ETHERNET`

- **Description:**

Enables network access. Requires a password to be set and enabled. SSH and Telnet access must be enabled or disabled separately. Also enables remote syslog support.

Disable telnet

- **Command:**

  `DISABLE TELNET`

- **Description:**

  Turns off telnet access to the HP APM board. Existing sessions will not be logged out.

Enable telnet

- **Command:**

  `ENABLE TELNET`

- **Description:**

  Turns on Telnet access to the HP APM.

Disable SSH

- **Command:**

  `DISABLE SSH`

- **Description:**

  Turns off SSH access to the HP APM.

Enable SSH

- **Command:**

  `ENABLE SSH`

- **Description:**

  Turns on SSH access to the HP APM.

Remove account

- **Command:**

  `REMOVE ACCOUNT "<username>"`

- **Description:**
  - Removes the specified account from the system.
  - If the user does not exist, then an error message appears. The Administrator account cannot be deleted.

Add account

NOTE: Only an Administrator can add or enable a new user account.

- **Command:**

  `ADD ACCOUNT "<username>"`

- **Description**:
  - Adds a new user to the system.
  - A single HP APM is capable of supporting up to 10 added accounts. The built-in Administrator account is the default and cannot be deleted.
  - All user accounts have the same permissions.
  - Each user account has its own login credentials.
    - After a command is entered with a valid username, you are prompted to enter a password for the new account. After the completion of the password entry, the new account is available for logging into the system.
    - If the password field is not specified, then the password appears after this command is entered and the username does not already exist.
  - Login accounts and passwords are stored separately from the board configuration. A `SHOW CONFIG` command does not reveal any `ADD ACCOUNT` commands.

Disable password

- **Command:**

  `DISABLE PASSWORD`

- **Description:**

  Disables the password protection feature. Disabling password protection also disables SSH and Telnet network access.

Enable password

- **Command:**

  `ENABLE PASSWORD`

- **Description:**

  Enables the password protection feature. SSH and Telnet access requires the password feature to be enabled.

Set password account

- **Command:**

  `SET PASSWORD`

  `SET PASSWORD "<password>"`

  SET PASSWORD ACCOUNT "<user>"

  SET PASSWORD ACCOUNT "<user>" "<password>"

- **Description:**
  - Configures the Administrator account password. Until a password is set, both Telnet and SSH are disabled. The password must be between 8 and 40 characters, and can include:
    - Uppercase letters
    - Lowercase letters
    - Underscores (_)
    - Dashes (-)
    - At signs (@)
    - Pound signs (#)
    - Carets (^)
    - Ampersands (&)
    - Exclamation points (!)
    - Plus symbols (+)
    - Equal symbols (=)
    - Tilde (~)
    - Numerical values between 0–9

    NOTE: Only the Administrator can add or remove an account. You can change your own password, but only the Administrator can change another user's password.

Ping

- **Command:**

  `PING`

- **Description:**

  Verifies network connectivity. Requires administrator access and has no restrictions.

  As an example, the following text might appear on screen:

```
> ping x.x.x.x
Pinging x.x.x.x (x.x.x.x) with 64 bytes of data:
Reply from x.x.x.x bytes=64 time=0ms ttl=128
Reply from x.x.x.x bytes=64 time=0ms ttl=128
Reply from x.x.x.x bytes=64 time=0ms ttl=128
Reply from x.x.x.x bytes=64 time=0ms ttl=128
--- x.x.x.x ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 4000 ms
rtt min/avg/max = 0/0/0 ms
```

Exit

- **Command:**

  `EXIT`

- **Description:**

Same as `LOGOUT`.

Help

- **Command:**

  `HELP`

- **Description:**

  Displays a list of available commands.

Logout

- **Command:**

  `LOGOUT`

- **Description:**

  Exits the CLI. Exiting terminates SSH or Telnet network connections. Exiting a connection through the serial port will return the user to the Login prompt.

Quit

- **Command:**

  `QUIT`

- **Description:**

  Same as `LOGOUT`.

Reset

- **Command:**

  `RESET`

- **Description:**

  Reboots HP APM. Unsaved configuration settings are lost.

Reset buddy

- **Command:**

  `RESET BUDDY`

- **Description:**

  Reboots the other (Buddy) connected to HP APM.

Reboot

- **Command:**

  `REBOOT`

- **Description:**

  Same as `RESET`.

Reboot CM

- **Command:**

  `REBOOT CM <PORT#> <DMPORT#>`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM Distribution Module port.

- **Description:**

  Reboots the HP Moonshot 1500 Chassis CM module.

Reset factory

> ⚠ **WARNING:** When you enter `RESET FACTORY`, HP APM erases your entire configuration. Before resetting factory defaults, consider saving your configuration. For more information on duplicating your configuration, see "Duplicating the configuration (on page 23)".

> **NOTE:** This command can only be run from the serial console.

- **Command:**

  `RESET FACTORY`

- **Description:**

  Restores HP APM to factory settings (including no password and Ethernet disabled) and then reboots HP APM.

Save

- **Command:**

  `SAVE`

- **Description:**

  Saves the current configuration to non-volatile memory.

Save config

- **Command:**

  `SAVE CONFIG`

- **Description:**

  Functionality identical to the `SAVE` command.

Set IP

- **Command:**

  `SET IP {DHCP | <IP_ADDRESS> <IP_MASK>}`

- **Description:**

  Assigns static IP address and subnet mask or can be used to configure DHCP. If setting IP address and subnet mask, both must be specified.

  Accepts the `NONE` token to disable IPv4 access to HP APM.

Set gateway

- **Command:**

  `SET GATEWAY {NONE | <IP_ADDRESS>}`

- **Description:**

  Assigns or removes gateway IP address.

Set name

- **Command:**

  `SET NAME "<name>"`

- **Description:**

  Assigns a name to HP APM that will appear in the log and syslog entries. Name can be up to 80 characters in length.

Set power

- **Command:**

  `SET POWER {ON|OFF|ENABLE|DISABLE} {ALL | <PORT#> <DMPORT#> {<NODE#>|ALL}}`

  where:

  `ALL` is used when the command applies to all nodes. You can also use it when the command applies to all the server nodes in a particular SL server enclosure.

  `<PORT#>` refers to the HP APM, PDM1, or PDM2 port numbers.

  `<DMPORT#>` refers to the HP APM Distribution Module port number or HP Intelligent Modular PDU Extension Bar outlet number.

  `<NODE#>` refers to the SL server node.

- **Description:**
  - Turns power on and off to SL enclosures.
  - `SET POWER ALL` shows the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures.

Set serial

- **Command:**

  `SET SERIAL <baud rate>`

- **Description:**
  - Configure the serial console baud rate.
  - Serial access to the CLI will be by default 115200 bits/s, no parity, 8 data bits, and one stop bit ("115200 N 8 1"). You can configure these parameters through the CLI.
  - Valid baud rates are 300, 1200, 2400, 4800, 9600, 14400, 19200, and 115200.

Set syslog

- **Command:**

  `SET SYSLOG {<ip_address>|NONE}`

- **Description:**

  Sets or clears the sending of HP APM log messages to a remote syslog server. Local logging is unaffected.

Set time

- **Command:**

  `SET TIME <month> <day> <year> <hour> <minute>`

  where:

  `<month>` is the month.

  `<day>` is the day.

  `<year>` is the year.

  `<hour>` is the hour, in 24-hour format. For example, enter 3:00 p.m. as 15.

  `<minute>` is the minute.

  HP APM does not automatically adjust for Daylight Savings Time.

  The time remains on this setting until you issue the `RESET FACTORY` command.

- **Description:**
  - Sets the system time on the battery-backed clock.
  - All five parameters must be present. The hour parameter must be in 24-hour format.

Set timeout

- **Command:**

  `SET TIMEOUT {<timeout_value> | NONE}`

  where:

  `<timeout_value>` is the session timeout value measured in seconds. For example, to set a 30-second session timeout, enter:

```
SET TIMEOUT 30
```

If you specify `NONE`, then no session timeouts are set. For example, enter:

```
SET TIMEOUT NONE
```

- **Description:**

  Sets the SSH and Telnet inactivity timeout.

Set power baseline

- **Command:**

  ```
  SET POWER BASELINE
  ```

- **Description:**

  Baseline or calibrate all servers that are connected to the HP APM. After you have established a baseline for the configuration, it is saved into the EEPROM on the HP APM and the configuration monitored for changes from the baseline configuration. Examples of changes to the configuration would include the removal or installation of servers or chassis. If HP APM is reset, the baseline is re-read from the EEPROM and compared to the discovered configuration after reset.

  The baseline is computed for the entire configuration and is not applicable to zones. When a power cap is set, the baseline data establishes the minimum and maximum power values that can be used for the cap. If you set a cap with a defined zone specified, then only that baseline data that was established for the enclosures and are within that zone are used to establish the minimum and maximum for the cap to that zone.

Set power cap

- **Command:**

  ```
  SET POWER CAP <wattage>|NONE [zone_name]
  ```

- **Description:**

  - Establishes a power cap for all the eligible chassis that are connected to the HP APM.

    The wattage value, if provided, represents the total wattage to be allocated among all the chassis that are part of the baseline or partial baseline if a zone, if specified. This value is divided by the total maximum wattage established by the baseline to come up with a percentage cap value. This percentage is then multiplied against each chassis maximum wattage value to arrive at an appropriate cap value for that individual chassis.

  - If you specify NONE instead of a cap wattage value, then HP APM removes all (or those in the specified zone, if desired) of the power caps.

Set asset info

- **Command:**

  ```
  SET ASSETINFO [PDM1|PDM2] "<asset_tag_string>"
  ```

- **Description:**

  - Enables HP APM to set an asset tag. Supported only on the HP 60A PDU.
  - The `<asset_tag_string>` can be up to 32 characters in length. The string will be programmed into the PDU and can be retrieved with the `SHOW ASSETINFO` command.

Show accounts

- **Command:**

  `SHOW ACCOUNTS`

- **Description:**

  Shows the existing defined accounts, including the reserved Administrator account.

Show config

- **Command:**

  `SHOW CONFIG`

- **Description:**

  Displays a re-playable script to reproduce the current HP APM configuration.

Show faults

- **Command:**

  `SHOW FAULTS`

- **Description:**

  Shows the fault log entries.

Show info

- **Command:**

  `SHOW INFO`

- **Description:**

  Shows information pertaining to the HP APM and HP APM Distribution Module, including MAC address, model number, and serial number.

Show log

- **Command:**

  `SHOW LOG`

- **Description:**

  Shows the event log.

Show syslog

- **Command:**

  `SHOW SYSLOG`

- **Description:**

Shows the current syslog IP address configuration. This command does not show the actual contents of the syslog.

Show name

- **Command:**

  `SHOW NAME`

- **Description:**

  Displays the rack name.

Show power

- **Command:**

  `SHOW POWER`

  `SHOW POWER <PORT#>`

  `SHOW POWER <PORT#> <DMPORT#>`

  `SHOW POWER PDM`

  `SHOW POWER ALL`

  where:

  `<PORT#>` refers to the HP APM, PDM1, or PDM2 port numbers.

  `<DMPORT#>` refers to the HP APM Distribution Module port number or the HP Intelligent Modular PDU Extension Bar outlet number.

- **Description:**
  - Shows the rack power status.
  - `SHOW POWER ALL` shows the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures.

Show rack

- **Command:**

  `SHOW RACK`

  `SHOW RACK <PORT#>`

  `SHOW RACK <PORT#> <DMPORT#>`

  `SHOW RACK ALL`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM Distribution Module port.

- **Description:**
  - Shows the contents of the rack.
  - `SHOW RACK ALL` shows the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures.

Show servers

- **Command:**

  `SHOW SERVERS`

  `SHOW SERVERS <PORT#>`

  `SHOW SERVERS <PORT#> <DMPORT#>`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM port.

- **Description:**

  Shows the same information as the `SHOW RACK` and `SHOW TOPOLOGY` commands.

Show topology

- **Command:**

  `SHOW TOPOLOGY`

  `SHOW TOPOLOGY <PORT#>`

  `SHOW TOPOLOGY <PORT#> <DMPORT#>`

  `SHOW TOPOLOGY ALL`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM Distribution Module port.

- **Description:**
  - Shows the same information as the `SHOW RACK` and `SHOW SERVERS` commands.
  - `SHOW TOPOLOGY ALL` shows the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures.

Show asset info

- **Command:**

  `SHOW ASSETINFO`

  `SHOW ASSETINFO <PORT#>`

  `SHOW ASSETINFO <PORT#> <DMPORT#>`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM Distribution Module port.

- **Description:**
  - Shows the chassis in a rack in a report format.
  - Also requests and shows any asset tags from the chassis and any HP-sourced 60A PDUs that are in the rack.

Show MAC address

- **Command:**

  `SHOW MACADDR`

  `SHOW MACADDR <PORT#>`

  `SHOW MACADDR <PORT#> <DMPORT#>`

  where:

  `<PORT#>` refers to the HP APM port.

  `<DMPORT#>` refers to the HP APM Distribution Module port.

- **Description:**

  Shows the contents of the rack, including the MAC addresses of the individual SL server nodes, if available.

Show time

- **Command:**

  `SHOW TIME`

- **Description:**

  Displays the currently set system time.

Show power baseline

- **Command:**

  `SHOW POWER BASELINE`

- **Description:**

  Reports the currently established baseline data for all chassis that are connected to the HP APM.

Show version

- **Command:**

  `SHOW VERSION`

  `SHOW VERSION ALL`

- **Description:**
  - Displays HP APM firmware copyright, version, build date, and hardware version. Also displays HP APM Distribution Module hardware and firmware versions.
  - `SHOW VERSION ALL` shows the HP Power Management Controller Utility hardware and firmware versions as well as the license status of all servers in the enclosures.

Upgrade image

- **Command:**
  - If using TFTP protocol for upgrading HP APM, enter:

```
UPGRADE IMAGE TFTP <ip_address> "<filename>"
```

- If using FTP protocol for upgrading HP APM, enter:

```
UPGRADE IMAGE FTP <ip_address> "<username>" "<password>" "<filename>"
```

- **Description:**
  - Updates HP APM firmware using the specified protocol. Protocol can be either FTP or TFTP. `<ip_address>` refers to the IP address of a server that contains the file to be transferred, and filename is the file to be transferred. Following the transfer, HP APM will be upgraded and reset to run the new image.
  - The filename must be enclosed in quotes to preserve case.

Add zone

- **Command:**

```
ADD ZONE <zone_name> [[<PORT#> <DMPORT#>]] | [<PORT#> ALL] | [ALL]
```

- **Description:**

  Adds one or more chassis to a zone named by <zone_name>. If the zone does not already exist, then it will be automatically created and the specified chassis will be added.

  You can create up to four zones.

  The parameters enable the addition of all chassis on all HP APM ports, all the chassis plugged into an HP APM port through a HP APM Distribution Module) or a specific chassis on a specified HP APM port and HP APM Distribution Module port. The syntax is similar to other HP APM commands such as SHOW POWER or SHOW RACK in how HP APM and HP APM Distribution Module ports are specified.

  When adding a chassis to a zone, the chassis does not have to be present and plugged into the HP APM. The HP APM issues a message in such cases, and therefore, the chassis does not exist. Zone definitions do not require the hardware to be present . For HP APM operations that might use zones (for example, SET POWER BASELINE), only those chassis that exist and are defined in the zone are considered for the operation.

  Examples:

```
ADD ZONE my_zone 1 5
```

  Adds the chassis plugged into HP APM Distribution Module port 5 on HP APM port 1 to zone MY_ZONE. If MY_ZONE did not already exist, it will be created.

```
ADD ZONE my_zone 1 all
```

  Adds all the chassis plugged into an HP APM Distribution Module on HP APM port 1.

```
ADD ZONE my_zone all
```

  Adds all chassis on the HP APM to zone MY_ZONE.

```
ADD ZONE BLUE 1 ALL 2 ALL 3 1
```

  You can also use ALL by itself instead of a PORT DMPORT pair.

  For example:

```
ADD ZONE BLUE ALL
```

  Zones cannot overlap.

Save zones

- **Command:**

  `SAVE ZONES`

- **Description:**
  - Commits the defined zones and their member chassis to the on-board EEPROM.
  - You can define and save up to four zones. These zones are automatically loaded from the EEPROM when the board is reset.

Show zones

- **Command:**

  `SHOW ZONES`

- **Description:**

  Displays all the currently defined zones and their respective member chassis.

Remove zone

- **Command:**

  `REMOVE ZONE <zone_name> [[<PORT#> <DMPORT#>]] | [<PORT#> ALL] | [ALL]`

  where:

  `<zone_name>` is the zone name.

  `<PORT#>` is the port number.

  `<DMPORT#>` is the distribution module port number.

  `<PORT# ALL>` is the port number.

  If no more chassis exist in the zone after the target chassis is removed, then the zone is automatically deleted. The syntax for indication which chassis is to be removed is identical to the `ADD ZONE` command.

- **Description:**

  Removes one or more chassis from a zone definition.

Enable pollpower

- **Command**

  `ENABLE POLLPOWER`

- **Description**

  Enables background process that polls each server for power usage.

Disable pollpower

- **Command**

```
DISABLE POLLPOWER
```

- **Description**

  Disables background process that polls each server for power usage.

Enable SNMP

- **Command:**

  ```
  ENABLE SNMP
  ```

- **Description:**

  Turns on SNMP protocol and agent in HP APM.

Disable SNMP

- **Command:**

  ```
  DISABLE SNMP
  ```

- **Description:**

  Turns off the SNMP protocol stack and agent. HP APM no longer responds to SNMP. This state is the default.

Show SNMP

- **Command:**

  ```
  SHOW SNMP
  ```

- **Description:**

  Displays all parameters related to SNMP including whether SNMP is enabled, read-only and read-write community strings, SNMP trap destinations, and the contact, name, and location settings.

Set SNMP RO

- **Command:**

  ```
  SET SNMP RO "<community_string>"
  ```

- **Description:**

  Sets the SNMP read-only public string to the string specified as a parameter.

Set SNMP RW

- **Command:**

  ```
  SET SNMP RW "<community_string>"
  ```

- **Description:**

  Sets the read-write string.

Set SNMP contact

- **Command:**

  `SET SNMP CONTACT "<sysContact>"`

- **Description:**

  Sets the MIB II sysContact field.

Set SNMP location

- **Command:**

  `SET SNMP LOCATION "<sysLocation>"`

- **Description:**

  Sets the MIB II sysLocation field.

Set SNMP trapdest

- **Command:**

  `SET SNMP TRAPDEST <<ip_addresses>|NONE>`

- **Description:**
  - Sets the IP addresses where SNMP traps are sent.

    You can set up to four SNMP trap destinations. For example, enter:

    `SET SNMP TRAPDEST x.x.x.x y.y.y.y z.z.z.z a.a.a.a`

    If you specify `NONE`, then no trap destinations are set. For example, enter:

    `SET SNMP TRAPDEST NONE`
  - HP APM supports the following SNMP traps:

    NOTE: SNMP traps denoted by an * are not supported on the HP ProLiant s6500 Chassis.

    - cpqRackNameChanged
    - cpqRackEnclosureRemoved
    - cpqRackEnclosureInserted
    - cpqRackEnclosureFanRemoved *
    - cpqRackEnclosureFanInserted *
    - cpqRackEnclosureFanFailed
    - cpqRackEnclosureFanOK
    - cpqRackPowerSupplyFailed
    - cpqRackPowerSupplyOK
    - cpqRackPowerSupplyRemoved
    - cpqRackPowerSupplyInserted
    - cpqRackServerBladeRemoved

— cpqRackServerBladeInserted

Enable XML

- **Command:**

  `ENABLE XML`

- **Description:**

  Turns on XML interface and makes XML queries available on the network using port 80 (HTTP).

  You can enable XML, or enable XML secure, but you cannot enable both concurrently.

Enable XML secure

- **Command:**

  `ENABLE XML SECURE`

- **Description:**

  Turns on XML interface and makes XML queries available on the network using port 443 (HTTPS). This command uses an encrypted secure socket connection.

  You can enable XML, or enable XML secure, but you cannot enable both concurrently.

Disable XML

- **Command:**

  `DISABLE XML`

- **Description:**

  Turns off the XML interface. This command turns off whichever interface (non-secured or secured) is enabled.

Show keys

- **Command:**

  `SHOW KEYS`

- **Description:**

  Shows the SSL certificate.

Reset keys

- **Command:**

  `RESET KEYS`

- **Description:**

  Erases the currently-defined DSA keys and RSA keys, regenerates new keys using a random number, and then generates a new SSL certificate.

Add RADIUS server

- **Command:**

  `ADD RADIUS SERVER <ip_address> <shared_secret>`

- **Description:**

  Specifies an initial, or additional RADIUS server to HP APM's list of authentication servers. The authentication proceeds in the same order that these servers were added to the configuration.

Enable RADIUS

- **Command:**

  `ENABLE RADIUS`

- **Description:**

  Enables HP APM as a RADIUS client.

Disable RADIUS

- **Command:**

  `DISABLE RADIUS`

- **Description:**

  Turns off RADIUS authentication on HP APM. Authentication through RADIUS no longer takes place, but password checking is still done against the local password if that is still enabled. Does not clear out the configured RADIUS servers.

Remove RADIUS server

- **Command:**

  `REMOVE RADIUS SERVER <index>`

- **Description:**

  Removes a previously added RADIUS server that matches the index indicated with the `SHOW RADIUS` command.

Show RADIUS

- **Command:**

  `SHOW RADIUS`

- **Description:**

  Shows the currently configured RADIUS servers.

Set RADIUS pollnum

- **Command:**

```
SET RADIUS POLLNUM
```

- **Description:**

  Number of times HP APM polls each of the radius server indicated in the `ADD RADIUS SERVER` command. This setting can only be set globally and cannot be applied to each individual RADIUS server.

Set RADIUS pollsec

- **Command:**

  ```
  SET RADIUS POLLSEC
  ```

- **Description:**

  Number of seconds HP APM waits for a reply from the RADIUS server. This setting can only be set globally and cannot be applied to each individual radius server.

Enable NTP

- **Command:**

  ```
  ENABLE NTP
  ```

- **Description:**

  Enables NTP operation. At least one NTP server must be configured before operation.

Set NTP server

- **Command:**

  ```
  SET NTP SERVER NONE|<ip_address> [ <ip_address> ]
  ```

- **Description:**

  Sets the NTP server to retrieve the time from using the configured polling cycle.

Set NTP poll

- **Command:**

  ```
  SET NTP POLL <poll_time_in_minutes>
  ```

- **Description:**

  Sets the time in minutes to poll for time from the configured NTP server.

Show NTP server

- **Command:**

  ```
  SHOW NTP SERVER NONE|<ip_address> [ <ip_address> ]
  ```

- **Description:**

  Indicates the NTP server to retrieve the time from using the configured polling cycle.

Show NTP poll

- **Command:**

  `SHOW NTP POLL <poll_time_in_minutes>`

- **Description:**

  Indicates the time in minutes to poll for time from the configured NTP server.

Disable NTP

- **Command:**

  `DISABLE NTP`

- **Description:**

  Disables NTP operation. No NTP request is sent out following the `DISABLE NTP` command.

Connect port

- **Command:**

  `CONNECT PORT {1-13} [FORCE]`

- **Description:**

  Connects the current CLI session to the specified serial port. When `FORCE` is specified, the current CLI console forcibly grabs control of the specified serial port. This is useful when another CLI session is already connected.

Set port

- **Command:**

  `SET PORT [ALL | {1-13}] (9600|19200|38400|56700|115200) [(7|8)(N|E|O)(1|2)]`

- **Description:**

  Configure a single port or all serial ports.

XML commands

Login

- **Command:**

```
<LOGIN USER_LOGIN="username" PASSWORD="password">
</LOGIN>
```

  where

  `USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

  `PASSWORD` is the password associated with the user.

- **Description:**

  This XML command provides the information used to authenticate the user.

Modify user

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<USER_INFO>
<MOD_USER USER_LOGIN="Administrator">
<PASSWORD VALUE="newpassword"/>
</MOD_USER>
</USER_INFO>
</LOGIN>
</SLAPMCL>
```

  where

  `USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

  `PASSWORD VALUE` is the password associated with the user.

- **Description:**

  This command, executed in XML, enables you to modify an existing local user account.

  The `USER_LOGIN` parameter must exist in the current user database. For this command to parse correctly, the command must appear within a `USER_INFO` command block, and `USER_INFO MODE` must be set to write.

  This command only supports changing the administrator password.

Get firmware version

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_FW_VERSION/>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests firmware information.

Get rack topology

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_RACK_TOPOLOGY/>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests a return of the current topology of a rack infrastructure.

Get rack information

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_RACK_INFO/>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests information about a rack infrastructure.

Modify compute node power

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<MOD_COMPUTE_NODE_POWER>
<SLAPM PORT=”1”/>
<DIST_MODULE PORT=”1”/>
<NODE PORT=”1”/>
<STATUS VALUE=”ON”/>
</MOD_COMPUTE_NODE_POWER>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests SL Power Management Controller to turn a node on or off.

Modify all compute node power

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<MOD_ALL_COMPUTE_NODES_POWER_VALUE="ON"/>
</LOGIN>
</SLAPMCL>
```

to turn on all nodes, or

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<MOD_ALL_COMPUTE_NODES_POWER_VALUE="OFF"/>
</LOGIN>
</SLAPMCL>
```

to turn off all nodes, where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests SL Power Management Controller to turn all nodes attached to HP APMon or off.

Get compute node

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_COMPUTE_NODE_POWER>
<SLAPM PORT=”1”/>
<DIST_MODULE PORT=”1”/>
<NODE PORT=”1”/>
```

```
</GET_COMPUTE_NODE_POWER>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests the power status of a node.

Get all compute node power

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<GET_ALL_COMPUTE_NODES_POWER/>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, requests the power status of all nodes attached to HP APM.

Reset HP APM

- **Command:**

```
<SLAPMCL VERSION="2.00">
<LOGIN USER_LOGIN="Administrator" PASSWORD="password">
<RESET_APM/>
</LOGIN>
</SLAPMCL>
```

where

`USER_LOGIN` is the login name of the user account. This parameter is case sensitive and must never be blank.

`PASSWORD` is the password associated with the user.

- **Description:**

  This command, executed in XML, resets HP APM.

Supported MIB objects

Supported cpqRack MIB objects

Object name	Object identifier	Notes
Compaq	1.3.6.1.4.1.232	—
cpqRackInfo	1.3.6.1.4.1.232.22	—
cpqRackMibRev	1.3.6.1.4.1.232.22.1	—
cpqRackMibRevMajor	1.3.6.1.4.1.232.22.1.1	—
cpqRackMibRevMinor	1.3.6.1.4.1.232.22.1.2	—
cpqRackMibCondition	1.3.6.1.4.1.232.22.1.3	—
cpqRackComponent	1.3.6.1.4.1.232.22.2	—
cpqRackAsset	1.3.6.1.4.1.232.22.2.2	—
cpqRackAssetTable	1.3.6.1.4.1.232.22.2.2.1	—
cpqRackAssetEntry	1.3.6.1.4.1.232.22.2.2.1.1	—
cpqRackAssetIndex	1.3.6.1.4.1.232.22.2.2.1.1.1	—
cpqRackName	1.3.6.1.4.1.232.22.2.2.1.1.2	—
cpqRackUid	1.3.6.1.4.1.232.22.2.2.1.1.3	Always returns -1.
cpqRackSerialNum	1.3.6.1.4.1.232.22.2.2.1.1.4	—
cpqRackTrapSequenceNum	1.3.6.1.4.1.232.22.2.2.1.1.5	Always returns -1.
cpqRackHeight	1.3.6.1.4.1.232.22.2.2.1.1.6	Always returns -1.
cpqRackWidth	1.3.6.1.4.1.232.22.2.2.1.1.7	Always returns -1.
cpqRackDepth	1.3.6.1.4.1.232.22.2.2.1.1.8	—
cpqRackEnclosure	1.3.6.1.4.1.232.22.2.3	—
cpqRackCommonEnclosure	1.3.6.1.4.1.232.22.2.3.1	—
cpqRackCommonEnclosureTable	1.3.6.1.4.1.232.22.2.3.1.1	—
cpqRackCommonEnclosureEntry	1.3.6.1.4.1.232.22.2.3.1.1.1	—
cpqRackCommonEnclosureRack	1.3.6.1.4.1.232.22.2.3.1.1.1.1	—
cpqRackCommonEnclosureHeight	1.3.6.1.4.1.232.22.2.3.1.1.1.12	Always returns -1.
cpqRackCommonEnclosureWidth	1.3.6.1.4.1.232.22.2.3.1.1.1.13	Always returns -1.
cpqRackCommonEnclosureDepth	1.3.6.1.4.1.232.22.2.3.1.1.1.14	Always returns -1.
cpqRackCommonEnclosureTrapSequenceNum	1.3.6.1.4.1.232.22.2.3.1.1.1.15	Always returns -1.
cpqRackCommonEnclosureCondition	1.3.6.1.4.1.232.22.2.3.1.1.1.16	Always returns -1.
cpqRackCommonEnclosureHasServerBlades	1.3.6.1.4.1.232.22.2.3.1.1.1.17	—
cpqRackCommonEnclosureHasPowerSupplies	1.3.6.1.4.1.232.22.2.3.1.1.1.18	—
cpqRackCommonEnclosureHasNetConnectors	1.3.6.1.4.1.232.22.2.3.1.1.1.19	Always returns -1.
cpqRackCommonEnclosureIndex	1.3.6.1.4.1.232.22.2.3.1.1.1.2	—
cpqRackCommonEnclosureHasTempSensors	1.3.6.1.4.1.232.22.2.3.1.1.1.20	Always returns -1.
cpqRackCommonEnclosureHasFans	1.3.6.1.4.1.232.22.2.3.1.1.1.21	—
cpqRackCommonEnclosureHasFuses	1.3.6.1.4.1.232.22.2.3.1.1.1.22	Always returns -1.
cpqRackCommonEnclosureMgmtUID	1.3.6.1.4.1.232.22.2.3.1.1.1.23	—

Object name	Object identifier	Notes
cpqRackCommonEnclosureSerialNumPrev	1.3.6.1.4.1.232.22.2.3.1.1.1.24	—
cpqRackCommonEnclosureSerialNumNext	1.3.6.1.4.1.232.22.2.3.1.1.1.25	—
cpqRackCommonEnclosureAddress	1.3.6.1.4.1.232.22.2.3.1.1.1.26	Always returns -1.
cpqRackCommonEnclosureProductId	1.3.6.1.4.1.232.22.2.3.1.1.1.27	Always returns an empty string "".
cpqRackCommonEnclosureProductIdPrev	1.3.6.1.4.1.232.22.2.3.1.1.1.28	Always returns an empty string "".
cpqRackCommonEnclosureProductIdNext	1.3.6.1.4.1.232.22.2.3.1.1.1.29	Always returns an empty string "".
cpqRackCommonEnclosureModel	1.3.6.1.4.1.232.22.2.3.1.1.1.3	—
cpqRackCommonEnclosureUUID	1.3.6.1.4.1.232.22.2.3.1.1.1.30	Always returns an empty string "".
cpqRackCommonEnclosureUUIDPrev	1.3.6.1.4.1.232.22.2.3.1.1.1.31	Always returns an empty string "".
cpqRackCommonEnclosureUUIDNext	1.3.6.1.4.1.232.22.2.3.1.1.1.32	Always returns an empty string "".
cpqRackCommonEnclosureFanWattage	1.3.6.1.4.1.232.22.2.3.1.1.1.34	—
cpqRackCommonEnclosureAssetTag	1.3.6.1.4.1.232.22.2.3.1.1.1.4	Always returns an empty string "".
cpqRackCommonEnclosurePartNumber	1.3.6.1.4.1.232.22.2.3.1.1.1.5	Always returns an empty string "".
cpqRackCommonEnclosureSparePartNumber	1.3.6.1.4.1.232.22.2.3.1.1.1.6	—
cpqRackCommonEnclosureSerialNum	1.3.6.1.4.1.232.22.2.3.1.1.1.7	—
cpqRackCommonEnclosureFWRev	1.3.6.1.4.1.232.22.2.3.1.1.1.8	—
cpqRackCommonEnclosureName	1.3.6.1.4.1.232.22.2.3.1.1.1.9	—
cpqRackCommonEnclosureFanTable	1.3.6.1.4.1.232.22.2.3.1.3	—
cpqRackCommonEnclosureFanEntry	1.3.6.1.4.1.232.22.2.3.1.3.1	—
cpqRackCommonEnclosureFanRack	1.3.6.1.4.1.232.22.2.3.1.3.1.1	—
cpqRackCommonEnclosureFanCondition	1.3.6.1.4.1.232.22.2.3.1.3.1.11	—
cpqRackCommonEnclosureFanChassis	1.3.6.1.4.1.232.22.2.3.1.3.1.2	—
cpqRackCommonEnclosureFanIndex	1.3.6.1.4.1.232.22.2.3.1.3.1.3	—
cpqRackCommonEnclosureFanLocation	1.3.6.1.4.1.232.22.2.3.1.3.1.5	—
cpqRackCommonEnclosureManagerTable	1.3.6.1.4.1.232.22.2.3.1.6	—
cpqRackCommonEnclosureManagerEntry	1.3.6.1.4.1.232.22.2.3.1.6.1	—
cpqRackCommonEnclosureManagerRack	1.3.6.1.4.1.232.22.2.3.1.6.1.1	—
cpqRackCommonEnclosureManagerPresent	1.3.6.1.4.1.232.22.2.3.1.6.1.10	—
cpqRackCommonEnclosureManagerFWRev	1.3.6.1.4.1.232.22.2.3.1.6.1.15	—
cpqRackServerEnclosureTable	1.3.6.1.4.1.232.22.2.3.2.1	—
cpqRackServerEnclosureEntry	1.3.6.1.4.1.232.22.2.3.2.1.1	—
cpqRackServerEnclosureRack	1.3.6.1.4.1.232.22.2.3.2.1.1.1	—
cpqRackServerEnclosureIndex	1.3.6.1.4.1.232.22.2.3.2.1.1.2	—
cpqRackServerEnclosureName	1.3.6.1.4.1.232.22.2.3.2.1.1.3	Always returns an empty string "".
cpqRackServerEnclosureMaxNumBlades	1.3.6.1.4.1.232.22.2.3.2.1.1.4	—
cpqRackServer	1.3.6.1.4.1.232.22.2.4	—

Object name	Object identifier	Notes
cpqRackServerBlade	1.3.6.1.4.1.232.22.2.4.1	—
cpqRackSystemTime	1.3.6.1.4.1.232.22.2.4.1.0	—
cpqRackServerBladeTable	1.3.6.1.4.1.232.22.2.4.1.1	—
cpqRackServerBladeEntry	1.3.6.1.4.1.232.22.2.4.1.1.1	—
cpqRackServerBladeRack	1.3.6.1.4.1.232.22.2.4.1.1.1.1	—
cpqRackServerBladeWidth	1.3.6.1.4.1.232.22.2.4.1.1.1.10	—
cpqRackServerBladeDepth	1.3.6.1.4.1.232.22.2.4.1.1.1.11	Always returns -1.
cpqRackServerBladePresent	1.3.6.1.4.1.232.22.2.4.1.1.1.12	—
cpqRackServerBladeHasFuses	1.3.6.1.4.1.232.22.2.4.1.1.1.13	—
cpqRackServerBladeEnclosureSerialNum	1.3.6.1.4.1.232.22.2.4.1.1.1.14	—
cpqRackServerBladeSlotsUsed	1.3.6.1.4.1.232.22.2.4.1.1.1.15	—
cpqRackServerBladeSerialNum	1.3.6.1.4.1.232.22.2.4.1.1.1.16	Always returns an empty string "".
cpqRackServerBladeProductId	1.3.6.1.4.1.232.22.2.4.1.1.1.17	Always returns an empty string "".
cpqRackServerBladeChassis	1.3.6.1.4.1.232.22.2.4.1.1.1.2	—
cpqRackServerBladeIndex	1.3.6.1.4.1.232.22.2.4.1.1.1.3	—
cpqRackServerBladeName	1.3.6.1.4.1.232.22.2.4.1.1.1.4	Always returns an empty string "".
cpqRackServerBladeEnclosureName	1.3.6.1.4.1.232.22.2.4.1.1.1.5	Always returns an empty string "".
cpqRackServerBladePartNumber	1.3.6.1.4.1.232.22.2.4.1.1.1.6	Always returns an empty string "".
cpqRackServerBladeSparePartNumber	1.3.6.1.4.1.232.22.2.4.1.1.1.7	Always returns an empty string "".
cpqRackServerBladePosition	1.3.6.1.4.1.232.22.2.4.1.1.1.8	—
cpqRackServerBladeHeight	1.3.6.1.4.1.232.22.2.4.1.1.1.9	—
cpqRackPollPower	1.3.6.1.4.1.232.22.2.4.2.0	—
cpqRackPower	1.3.6.1.4.1.232.22.2.5	—
cpqRackPowerSupply	1.3.6.1.4.1.232.22.2.5.1	—
cpqRackPowerSupplyTable	1.3.6.1.4.1.232.22.2.5.1.1	—
cpqRackPowerSupplyEntry	1.3.6.1.4.1.232.22.2.5.1.1.1	—
cpqRackPowerSupplyRack	1.3.6.1.4.1.232.22.2.5.1.1.1.1	—
cpqRackPowerSupplyPresent	1.3.6.1.4.1.232.22.2.5.1.1.1.16	—
cpqRackPowerSupplyCondition	1.3.6.1.4.1.232.22.2.5.1.1.1.17	—
cpqRackPowerSupplyEnclosureSerialNum	1.3.6.1.4.1.232.22.2.5.1.1.1.18	—
cpqRackPowerSupplyChassis	1.3.6.1.4.1.232.22.2.5.1.1.1.2	—
cpqRackPowerSupplyIndex	1.3.6.1.4.1.232.22.2.5.1.1.1.3	—
cpqRackPowerSupplyEnclosureName	1.3.6.1.4.1.232.22.2.5.1.1.1.4	—
cpqRackNameChanged	1.3.6.1.4.1.232.22001	—
cpqRackEnclosureRemoved	1.3.6.1.4.1.232.22003	—
cpqRackEnclosureInserted	1.3.6.1.4.1.232.22004	—
cpqRackEnclosureFanFailed	1.3.6.1.4.1.232.22008	—
cpqRackEnclosureFanOk	1.3.6.1.4.1.232.22010	—
cpqRackEnclosureFanRemoved	1.3.6.1.4.1.232.22011	Supported with

Object name	Object identifier	Notes
		exception of HP ProLiant s6500 Chassis
cpqRackEnclosureFanInserted	1.3.6.1.4.1.232.22012	Supported with exception of HP ProLiant s6500 Chassis
cpqRackPowerSupplyFailed	1.3.6.1.4.1.232.22013	—
cpqRackPowerSupplyOk	1.3.6.1.4.1.232.22015	—
cpqRackPowerSupplyRemoved	1.3.6.1.4.1.232.22016	—
cpqRackPowerSupplyInserted	1.3.6.1.4.1.232.22017	—
cpqRackServerBladeRemoved	1.3.6.1.4.1.232.22028	—
cpqRackServerBladeInserted	1.3.6.1.4.1.232.22029	—
cpqRackServerBladePoweredOn	1.3.6.1.4.1.232.22069	—
cpqRackServerBladePoweredOff	1.3.6.1.4.1.232.22070	—

Supported cpqHostOs MIB objects

Object name	Object identifier	Notes
compaq	1.3.6.1.4.1.232	
cpqHostOs	1.3.6.1.4.1.232.11	
cpqHoMibRev	1.3.6.1.4.1.232.11.1	
cpqRackMibRevMajor	1.3.6.1.4.1.232.22.1.1	
cpqRackMibRevMinor	1.3.6.1.4.1.232.22.1.2	
cpqRackMibCondition	1.3.6.1.4.1.232.22.1.3	
cpqHoSystemStatus	1.3.6.1.4.1.232.11.2.10	
cpqHoMibStatusArray	1.3.6.1.4.1.232.11.2.10.1	
cpqHoConfigChangedDate	1.3.6.1.4.1.232.11.2.10.2	
cpqHoGUID	1.3.6.1.4.1.232.11.2.10.3	Always returns an empty string "".
cpqHoCodeServer	1.3.6.1.4.1.232.11.2.10.4	Always returns -1.
cpqHoWebMgmtPort	1.3.6.1.4.1.232.11.2.10.5	Always returns -1.
cpqHoGUIDCanonical	1.3.6.1.4.1.232.11.2.10.6	Always returns an empty string "".

Supported rfc1213 MIB objects

Object name	Object identifier
mib-2	1.3.6.1.2.1
system	1.3.6.1.2.1.1
sysDescr	1.3.6.1.2.1.1.1
sysObjectID	1.3.6.1.2.1.1.2
sysUpTime	1.3.6.1.2.1.1.3

Object name	Object identifier
sysContact	1.3.6.1.2.1.1.4
sysName	1.3.6.1.2.1.1.5
sysLocation	1.3.6.1.2.1.1.6
sysServices	1.3.6.1.2.1.1.7
transmission	1.3.6.1.2.1.10
snmp	1.3.6.1.2.1.11
snmpInPkts	1.3.6.1.2.1.11.1
snmpInBadValues	1.3.6.1.2.1.11.10
snmpInReadOnlys	1.3.6.1.2.1.11.11
snmpInGenErrs	1.3.6.1.2.1.11.12
snmpInTotalReqVars	1.3.6.1.2.1.11.13
snmpInTotalSetVars	1.3.6.1.2.1.11.14
snmpInGetRequests	1.3.6.1.2.1.11.15
snmpInGetNexts	1.3.6.1.2.1.11.16
snmpInSetRequests	1.3.6.1.2.1.11.17
snmpInGetResponses	1.3.6.1.2.1.11.18
snmpInTraps	1.3.6.1.2.1.11.19
snmpOutPkts	1.3.6.1.2.1.11.2
snmpOutTooBigs	1.3.6.1.2.1.11.20
snmpOutNoSuchNames	1.3.6.1.2.1.11.21
snmpOutBadValues	1.3.6.1.2.1.11.22
snmpOutGenErrs 1.3.6.1.2.1.11.24	1.3.6.1.2.1.11.24
snmpOutGetRequests	1.3.6.1.2.1.11.25
snmpOutGetNexts	1.3.6.1.2.1.11.26
snmpOutSetRequests	1.3.6.1.2.1.11.27
snmpOutGetResponses	1.3.6.1.2.1.11.28
snmpOutTraps	1.3.6.1.2.1.11.29
snmpInBadVersions	1.3.6.1.2.1.11.3
snmpEnableAuthenTraps	1.3.6.1.2.1.11.30
snmpInBadCommunityNames	1.3.6.1.2.1.11.4
snmpInBadCommunityUses	1.3.6.1.2.1.11.5
snmpInASNParseErrs	1.3.6.1.2.1.11.6
snmpInTooBigs	1.3.6.1.2.1.11.8
snmpInNoSuchNames	1.3.6.1.2.1.11.9
interfaces	1.3.6.1.2.1.2

Object name	Object identifier
ifNumber	1.3.6.1.2.1.2.1
ifNumber	1.3.6.1.2.1.2.1
ifTable	1.3.6.1.2.1.2.2
ifEntry	1.3.6.1.2.1.2.2.1
ifIndex	1.3.6.1.2.1.2.2.1.1
ifInOctets	1.3.6.1.2.1.2.2.1.10
ifInUcastPkts	1.3.6.1.2.1.2.2.1.11
ifInNUcastPkts	1.3.6.1.2.1.2.2.1.12
ifInDiscards	1.3.6.1.2.1.2.2.1.13
ifInErrors	1.3.6.1.2.1.2.2.1.14
ifInUnknownProtos	1.3.6.1.2.1.2.2.1.15
ifOutOctets	1.3.6.1.2.1.2.2.1.16
ifOutUcastPkts	1.3.6.1.2.1.2.2.1.17
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PDU identity table

Two new tables are supported in the PDU section of the CPQ POWER MIB. These two tables are supported for both the 30- and 60-amp PDUs, but not for the HP Intelligent Modular PDU Managed Extension Bar.

The PDU identity table has general PDU information. The table contains two rows that match the two PDM ports on the HP APM. If a port is not populated with the PDU, then that row in the SNMP table contains blanks or zeros, depending on whether it is a string or a numeric value.

Item	Description
pduName	PDU asset tag. You can set this value through the CLI. However, you cannot set this value through SNMP, even though the MIB defines this value as read/writer.
pduModel	Factory programmed
pduManufacturer	HP
pduPartNumber	Factory programmed
pduSerialNumber	Factory programmed
pduControllable	1.3.6.1.2.1.1.4

PDU input table

The PDU input table is the second table supported in the PDU section of the CPQPOWER MIB.

This table contains two columns, but eight rows. The two columns are inputVoltage and inputCurrent. The PDU does not support inputVoltage, but it supports inputCurrent.

The PDU input is three-phase power, but each PDU will list four inputs. The first three inputs are the three respective phases and the last “input” is the neutral wire.

The PDU input table has eight rows because the first four (rows 1 to 4) correspond to a PDU plugged into HP APM port PDM1 and the last four (rows 5 to 8) correspond to a PDU plugged into HP APM port PDM2. If a power distribution module port does not have a PDU plugged into it (or another device) those rows will return 0 for their input current values.

Regulatory information

Safety and regulatory compliance

For safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the HP website (http://www.hp.com/support/Safety-Compliance-EnterpriseProducts).

Belarus Kazakhstan Russia marking

Manufacturer

Hewlett-Packard Company, Address: 3000 Hanover Street, Palo Alto, California 94304, U.S.

Local representative information (Russian)

- HP Russia

  ЗАО "Хьюлетт-Паккард А.О.", 125171, Россия, г. Москва, Ленинградское шоссе, 16А, стр.3, тел/факс: +7 (495) 797 35 00, +7 (495) 287 89 05

- HP Belarus

  ИООО «Хьюлетт-Паккард Бел», 220030, Беларусь, г. Минск, ул. Интернациональная, 36-1, офис 722-723, тел.: +375 (17) 392 28 18, факс: +375 (17) 392 28 21

- HP Kazakhstan

  ТОО «Хьюлетт-Паккард (К), 050040, Казахстан, г. Алматы, Бостандыкский район, ул. Тимирязева, 28В, 1 этаж, тел./факс: +7 (727) 355 35 50, +7 (727) 355 35 51

Local representative information (Kazakh)

ЖШС «Хьюлетт-Паккард (К)», Қазақстан, Алматы қ., Бостандық ауданы, Тимирязев к-сі, 28В, тел./факс: +7 (727) 355 35 50, +7 (727) 355 35 51

Manufacturing date

The manufacturing date is defined by the serial number (HP serial number format for this product):
`CCSYWWZZZZ`

Valid date formats include the following:

- `YWW`, where `Y` indicates the year counting from within each new decade, with 2000 as the starting point. For example, 238: 2 for 2002 and 38 for the week of September 9. In addition, 2010 is indicated by 0, 2011 by 1, 2012 by 2, 2013 by 3, and so forth.
- `YYWW`, where `YY` indicates the year, using a base year of 2000. For example, 0238: 02 for 2002 and 38 for the week of September 9.

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057

Warranty information

HP ProLiant and X86 Servers and Options (http://www.hp.com/support/ProLiantServers-Warranties)

HP Enterprise Servers (http://www.hp.com/support/EnterpriseServers-Warranties)

HP Storage Products (http://www.hp.com/support/Storage-Warranties)

HP Networking Products (http://www.hp.com/support/Networking-Warranties)

Support and other resources

Before you contact HP

Be sure to have the following information available before you call HP:

- Active Health System log (HP ProLiant Gen8 or later products)

  Download and have available an Active Health System log for 3 days before the failure was detected. For more information, see the *HP iLO 4 User Guide* or *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/ilo/docs).

- Onboard Administrator SHOW ALL report (for HP BladeSystem products only)

  For more information on obtaining the Onboard Administrator SHOW ALL report, see the HP website (http://www.hp.com/go/OAlog).

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Product identification number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For United States and worldwide contact information, see the Contact HP website (http://www.hp.com/go/assistance).

In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.
- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (http://www8.hp.com/us/en/support-drivers.html). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html).

Acronyms and abbreviations

CM

chassis management

DHCP

Dynamic Host Configuration Protocol

FQDN

Fully Qualified Domain Name

LLDP

Link Layer Discovery Protocol

MIB

management information base

NTP

network time protocol

PDU

power distribution unit

RADIUS

Remote Authentication Dial-In User Service

SSH

Secure Shell

TFTP

Trivial File Transfer Protocol

UID

unit identification

XML

extensible markup language

Documentation feedback

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