Implementing power management products with HP Systems Insight Manager

how to

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Abstract

This paper briefly describes HP Systems Insight Manager, HP Power Manager 4.0, and HP Rack and
Power Manager 1.1 management applications for monitoring the wellness status of power products. It
describes how HP Systems Insight Manager can communicate with the other applications to provide
complete control and status of HP uninterruptible power supplies and console management
controllers. It then defines configuration procedures required to enable the management applications
to work together.

Symbols in text

The following symbols may be found in the text of this document.

<table>
<thead>
<tr>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WARNING:</strong> Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.</td>
</tr>
<tr>
<td><strong>CAUTION:</strong> Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.</td>
</tr>
<tr>
<td><strong>IMPORTANT:</strong> Text set off in this manner presents clarifying information or specific instructions.</td>
</tr>
<tr>
<td><strong>NOTE:</strong> Text set off in this manner presents commentary, sidelights, or interesting points of information.</td>
</tr>
</tbody>
</table>

Introduction

Enterprise server systems are heavily relied upon to keep businesses and their customers up and running. Since just minutes of downtime can translate into many dollars of lost revenue, system administrators bear a significant responsibility to keep server systems up and running.

The importance of system management increases with the size of the system. Planning an enterprise solution must take into account the growth of a system and accommodating that growth. HP provides system and power management products with the features and flexibility to provide a very scalable management solution.

HP Systems Insight Manager is a management application that collects system status information and allows proactive administration of an entire system. HP Systems Insight Manager can provide either single-tier management by obtaining component status directly or a more powerful hierarchal management solution by working with power management utilities such as HP Power Manager and HP Rack and Power Management.

**NOTE:** This document discusses only HP components and solutions; however, the information and ideas presented herein may be applicable to third party hardware.

**NOTE:** This document is intended to supplement and not replace existing user documentation for products mentioned. For more information, refer to user documentation supplied with hardware and software products.
# Glossary

Table 1. Glossary of network and rack management terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Console Management Controller (CMC)</td>
<td>A component for monitoring rack security and wellness. It uses sensors to detect such parameters as temperature, humidity, smoke, vibration, and intrusion, as well as fan control.</td>
</tr>
<tr>
<td>HP Power Manager (HP PM)</td>
<td>Power management software that runs on a machine designated as a management server.</td>
</tr>
<tr>
<td>HP Rack and Power Manager (HP RPM)</td>
<td>Power management software that runs on a machine designated as a management server.</td>
</tr>
<tr>
<td>HP Systems Insight Manager (HP SIM)</td>
<td>Management software that runs on a machine designated as a management server for a network.</td>
</tr>
<tr>
<td>management agent</td>
<td>A software or firmware program that allows a manageable device to record and communicate status to a management server.</td>
</tr>
<tr>
<td>management console</td>
<td>User interface hardware (keyboard/video/mouse) connected to the management server.</td>
</tr>
<tr>
<td>management information base (MIB)</td>
<td>A file containing trap, control, and monitor information used by management agents and management consoles. As received by Systems Insight Manager, the MIB is simply referred to as a trap.</td>
</tr>
<tr>
<td>management server</td>
<td>A designated server running management software for controlling and monitoring other manageable components in a rack or network.</td>
</tr>
<tr>
<td>remote agent</td>
<td>Software that runs on a networked machine (other than a management server) being powered by a managed UPS. The remote agent allows graceful shut-down of the machine’s operating system in the event of power failure.</td>
</tr>
<tr>
<td>serial relay agent</td>
<td>Software that runs on a networked machine (other than a management server) that is attached serially with a UPS. The serial relay agent allows the management server running HP RPM to communicate with another machine’s UPS.</td>
</tr>
<tr>
<td>system agent</td>
<td>Software running on a server (other than a management server) that allows that server to be discovered and managed by management software.</td>
</tr>
<tr>
<td>trap</td>
<td>Alert generated by a managed device or application when a specific condition is detected and transferred using SNMP.</td>
</tr>
<tr>
<td>uninterruptible power supply (UPS)</td>
<td>Power component used for both distributing power and providing battery backup during power failures.</td>
</tr>
</tbody>
</table>
HP system management applications

HP offers management software that provides system administrators with full control over enterprise systems. HP management applications are designed for compatibility and can work together to provide comprehensive control of an enterprise system.

HP Systems Insight Manager

HP Systems Insight Manager (HP SIM) software is a full-featured server/network management tool that provides status of a system’s security and wellness. HP Systems Insight Manager uses hypertext transmission protocol (HTTP), Simple Network Management Protocol (SNMP) or Distributed Management Interface (DMI) data protocols to discover and manage servers, switches, and other manageable devices. HP Systems Insight Manager works directly with system agents or with other management applications to pinpoint fault and performance issues. A system administrator can use HP Systems Insight Manager on a local console or access the program remotely through a browser.

HP Power Manager

HP Power Manager (HP PM) is a web-based application that enables administrators to manage an HP UPS from a browser-based management console. Administrators can monitor, manage, and control a single UPS locally and remotely. A familiar browser interface provides secure access to management servers anywhere on the network. Administrators may configure power failure settings and define UPS load segments for maximum uptime of critical servers. The UPS can also be configured to extend runtimes for critical devices during utility power failures. For most UPSs, the receptacles on the rear panel are divided into one or more groups, called load segments, which can be controlled independently. Shutting down a load segment connected to less critical equipment extends the runtime for more critical equipment, providing additional protection.

HP Rack and Power Manager

HP Rack and Power Manager (HP RPM) is an Enterprise-class application providing comprehensive device control in data center environments where multiple users need to access and manage many devices both locally and remotely. A familiar browser interface provides secure remote access (up to 128-bit SSL encryption) to the management server anywhere on a network. HP Rack and Power Manager allows users to schedule system shutdowns, control power failure settings, and define UPS load segments to allow for maximum uptime of critical servers. This software offers several additional features including the ability to configure redundant UPSs and system event handling, which allows users to establish power and environmental failure policies with programmed automatic responses.

SNMP overview

Simple Network Management Protocol (SNMP) is a data collection protocol that shares TCP/IP properties and has become increasingly popular for communicating with manageable network devices. HP SIM, HP PM, and HP RPM use SNMP for alert notification.

The SNMP method of data collection uses a data repository file called a Management Information Base (MIB). A device with the ability to store event and status information uses a MIB. When an event occurs and is detected by a device, the device creates and sends an alert (commonly called a trap) to the management console running system management software.
Using power management applications with Systems Insight Manager

Power management applications such as HP PM and HP RPM can be configured as plug-ins for HP SIM. Using multiple management applications provides a hierarchal system management solution for large enterprise systems where scalability is important.

As shown in Figure 1, the power management console constantly monitors UPSs (with HP PM or HP RPM) and CMCs (with HP RPM only) that are networked or connected serially to managed servers. While HP SIM can receive traps from some of these devices directly, system administrators may want to take advantage of the HP PM or HP RPM capability to react according to the reported condition (for example, to initiate a software/hardware shut down after detecting that a system has switched over to battery power). The trap sent by HP PM or HP RPM to HP SIM will then reflect the latest status of the rack/power situation under control of the power management console.

**Figure 1.** Communication/trap flow with HP SIM and power management consoles

![Diagram showing communication/trap flow with HP SIM and power management consoles]

**NOTE:** In Figure 1, the HP SIM and power management consoles are shown separately for clarity. Actual configuration may have consoles located within the rack.

Using HP Systems Insight Manager with a power management application requires the administrator to configure both applications to recognize data transferred between them. This requires the following procedures:
- Configuring HP Systems Insight Manager to work with the power management application
- Configuring the power management application to send traps to HP Systems Insight Manager
Configuring HP Systems Insight Manager to work with power management applications

HP SIM can be configured to launch HP PM and HP RPM and to accept traps from them.

Configuring HP SIM to receive HP PM or HP RPM SNMP traps

For HP SIM to receive traps from HP PM or HP RPM, MIB version 1.7 must be loaded and registered. In addition, HP SIM must discover the management console that is running the power management application. As part of the device discovery process, HP SIM automatically detects a management console and places a hyperlink to it on the HP SIM Links page as shown in Figure 2.

NOTE: HP PM and/or HP RPM services must be installed and running before HP SIM can discover them. In addition, any machine that has been upgraded to HP PM 4.0 from HP PM version 3.1 or 3.2 and was configured with SSL ports using the HP PM-generated certificate must have its certificate replaced by HP PM 4.0. This is accomplished by going to the \certs folder (located within the folder containing HP PM 4.0) and removing the certificate file. Restarting HP PM 4.0 will generate a new certificate. HP SIM can discover an HP PM machine using an old certificate, but the link displayed in the HP SIM page will not be correct.

If the software is installed using the HTTP on port 80 or port 443 for SSL, a link to the software will appear on the system home page in HP SIM for the computer with HP PM running, as shown previously in Figure 2. However, if the default web ports are not used for configuring HP PM, a new entry can be made to the file “additionalwsdisc.props” located in the “Config/Identification” directory (in the HP SIM install directory) to correctly discover and identify HP PM running on any computer.
The following example lists the text of file “additionalwsdisc.props” modified to specify port #1234 for use by HP SIM to discover HP PM:

#-------------------------------------------------------
#Additional Web Server Discover Properties
#-------------------------------------------------------
#NOTE: See “AdditionalWsDisc_README.txt” for a description of entries in this file and how to add or remove additional web server ports for discovery and identification.
#-------------------------------------------------------
The following are actual web server ports enabled by default.
#To remove them from the discovery process, comment out the line with a '#' or remove it. You will need to restart the HP SIM service for the changes to take effect. In addition, you will need to run the Device Identification task to find any new ports that were defined.
#-------------------------------------------------------
#411=Director Agent,,true,false,,http
#3201=Compaq TaskSmart,,true,false,,https
#8008=Default Home Page,,true,false,,http
#1311=Server Administrator,,true,false,,https
#1234=HP Power Manager,,true,false,,https

For more information on editing the file “additionalwsdisc.props,” refer to the “additionalwsdisc_README.txt” file located in the same directory.

HP SIM version 4.2 has CPQRPM.MIB version 1.7 registered by default. Earlier versions of HP SIM will likely have a MIB version of 1.6 or earlier. To verify and, if necessary, unregister and register MIB version 1.7, proceed as follows:

1. In the HP\Systems Insight Manager\mibs\ folder, select the file “CPQRPM.MIB” and open with a text editor such as WordPad. The file’s header section should include the following text:

   -- The Compaq Enterprise number is 232.
   -- The ASN.1 prefix to, and including the Compaq Enterprise is:
   -- 1.3.6.1.4.1.232
   --
   -- MIB Version 1.7

   If the version is 1.7, no further action is required. If the version is 1.6, proceed with step 2.

2. To un-register the MIB, use the command line interface to run `mxmib -d cpqrpm.mib` from the HP\Systems Insight Manager\ folder.

3. Verify that the MIB is successfully unregistered. At the command line, enter `HP\Systems Insight Manager>mxmib`. The old MIB file should not be listed.

4. Load the HP Power Management Pack CD or the HP Rack and Power Management Pack CD and copy the file “CPQRPM.MIB” (version 1.7) to the HP\Systems Insight Manager\mibs\ folder on the system.

   **NOTE:** The MIB version 1.7 file may be available as a Softpaq update through hp.com.

5. From the HP\systems Insight Manager\mibs\ folder, run `mcompile cpqrpm.mib` from the command line to compile the new MIB. A new file named CPQRPM.CFG is created.

6. Register the new MIB by entering `mxmib -a cpqrpm.cfg` from the HP\Systems Insight Manager\mibs\ command line.

7. Verify that the new MIB is registered by entering `HP\Systems Insight Manager\mibs>mxmib` at the command line.
Configuring HP SIM to launch HP PM or HP RPM

Power management applications such as HP PM and HP RPM can be launched from within HP SIM. Launch links for each instance of a power management application can be added to the HP SIM tools menu.

To edit and use a tool definition file to create a launch link, complete the following procedure:

1. Using the command line interface and/or text editor, create or copy one of the following text definition files:

   **Example file for HP PM:**

   ```xml
   <?xml version="1.0" encoding="UTF-8" ?>
   <tool-list>
   <web-launch-tool name="HPPM1" max-targets="1" revision="4.0">
   <category>Local Tools</category>
   <description>HP Power Manager Rack 1</description>
   <execute-as-user>root</execute-as-user>
   <toolbox-enabled value="true" />
   <web-block accepts-targets="false">
   <main-url>http://172.25.234.206</main-url>
   </web-block>
   <attribute name="menu-path">Tools|Integrated Consoles</attribute>
   <attribute name="i18n-attrs">TOOL,hppm</attribute>
   <attribute name="target-frame">RPMFrame</attribute>
   </web-launch-tool>
   <web-launch-tool name="HPPM2" max-targets="1" revision="4.0">
   <category>Local Tools</category>
   <description>HP Power Manager Rack 2</description>
   <execute-as-user>root</execute-as-user>
   <toolbox-enabled value="true" />
   <web-block accepts-targets="false">
   <main-url>http://172.25.234.207</main-url>
   </web-block>
   <attribute name="menu-path">Tools|Integrated Consoles</attribute>
   <attribute name="i18n-attrs">TOOL,hppm</attribute>
   <attribute name="target-frame">RPMFrame</attribute>
   </web-launch-tool>
   </tool-list>
   
   **Example file for HP RPM:**

   ```xml
   <?xml version="1.0" encoding="UTF-8" ?>
   <tool-list>
   <web-launch-tool name="HPRPM" max-targets="1">
   <category>Local Tools</category>
   <description>HP Rack and Power Manager</description>
   <execute-as-user>root</execute-as-user>
   <toolbox-enabled value="true" />
   <web-block accepts-targets="false">
   <main-url>https://172.25.234.220:3257</main-url>
   </web-block>
   <attribute name="menu-path">Tools|Integrated Consoles</attribute>
   <attribute name="i18n-attrs">TOOL,HPPowerManager</attribute>
   <attribute name="target-frame">RPMFrame</attribute>
   </web-launch-tool>
   </tool-list>
   ```
In the previous examples, bolded text indicates data to be defined for the tool definition file for each application instance, for example:

- The name parameter (*HPPM1* and *HPRPM* in the previous examples) will appear in the Tools menu in HP SIM and should be different for each instance of a power management application being launched.

- The description parameter (*HP Power Manager Rack 1* and *HP Rack and Power Manager* in the previous examples) describes the power management application and appears only in the list of tool definition files.

- The URL parameter (*http://172.25.234.207* and *https://172.25.234:3257* in the examples above) specifies the IP address of the management console for each instance of a power management application.

2. Provide a name for the tool definition file created in step 1 and give it an .xml file name extension (example: “HPPowerManager.xml”).

3. Copy the tool definition file named in step 2 into the HP SIM program folder (default folder is HP\Systems Insight Manager\).

4. Using the command line interface in the HP\Systems Insight Manager\ folder, run the command `setnimbusenv`.

5. Using the command line interface in the HP\Systems Insight Manager\ folder, run the command `mxtool -a -f <filename.xml>` (using the file name you specified in step 2).

6. Log out of the current browser session and/or close HP SIM.

7. Launch HP SIM and go to *Tools > Integrated Consoles*. The new launch link(s) should be listed there (as illustrated in Figure 3).

**Figure 3. Verifying launch links created for HP SIM**

**NOTE:** If you are running a Japanese operating system, copy the provided properties file “HPPowerManager_ja.properties” to the HPSIM program folder (default folder is HP\Systems Insight Manager\).

4. Using the command line interface in the HP\Systems Insight Manager\ folder, run the command `setnimbusenv`.

5. Using the command line interface in the HP\Systems Insight Manager\ folder, run the command `mxtool -a -f <filename.xml>` (using the file name you specified in step 2).

6. Log out of the current browser session and/or close HP SIM.

7. Launch HP SIM and go to *Tools > Integrated Consoles*. The new launch link(s) should be listed there (as illustrated in Figure 3).

**Figure 3. Verifying launch links created for HP SIM**

**NOTE:** After a tool is added, it can be edited by modifying the XML tool definition file and committing the changes using the `mxtool --m` command. For a complete description of `mxtool` arguments, refer to `hpwebadmin\webapps\mxhelp\mxportal\en\man\mxtool.1m.html` in the HPSIM program folder.
Configuring HP Power Manager 4.0 to send traps to HP Systems Insight Manager

HP PM must be configured to send SNMP traps to HP SIM. To set up the SNMP trap recipient parameters, perform the following steps:

**NOTE:** Before performing the following steps, you must know the IP address of the management server running HP SIM.

1. Launch HP Power Manager 4.0. In the left navigation area, select **Event Settings** as shown in Figure 4.

---

**Figure 4.** HP PM 4.0 main screen
2. In the Event Notifications window, select **SNMP**, as shown in Figure 5.

Figure 5. HP PM 4.0 event notification window

3. In the SNMP Setup window (Figure 6), replace the default “public” entry in the Trap Community String field with the appropriate string.

Figure 6. HP PM 4.0 SNMP Setup window

4. In the Enabled column of the SNMP Setup window, select a checkbox for each event type to be reported.
5. In the SNMP Address(es) field of each enabled event, enter the IP address of the management console running HP Systems Insight Manager.

6. In the Delay (seconds) column of the SNMP Setup window, enter the number of seconds for HP PM to wait before sending the trap to HP SIM.

**NOTE:** If the event clears before the delay time has expired, the event notification will not be sent.

7. Click **Save Changes**.

8. Click **Send Test Message** to send a test trap to the management console running HP SIM.
Configuring HP Rack and Power Manager to send traps to HP Systems Insight Manager

HP RPM must be configured to send SNMP traps to HP SIM. The configuration requires two procedures:

- Setting the SNMP trap parameters
- Configuring the notification method for each event

**Setting SNMP trap recipient parameters**

To set up the SNMP trap recipient parameters, perform the following steps:

> **NOTE:** Before performing the following step, you must to know the IP address of the management server running HP SIM.

1. Launch Rack and Power Manager. In the top frame of the main screen, click the **Settings** icon.
2. Select **Server** and then **Notification Recipients**. The Notification Recipients screen should appear.
3. Click the **SNMP Traps** tab. The SNMP Traps window should appear as shown in Figure 7.

![Figure 7. HP RPM SNMP Traps window](image)

4. Click **Add New SNMP Recipient List**. The SNMP Recipients window is displayed (Figure 8).

![Figure 8. HP RPM SNMP Recipients window](image)

5. In the Recipient List field, enter the name of the list to modify.
6. In the first blank Name field, enter **IM7**.
7. In the corresponding IP Address field, enter the IP address of the management console running Systems Insight Manager. Click **Apply** to accept the information (or **Undo Changes** to reject the entry).
8. Click **Issue Test SNMP Trap** to send a test trap.
9. Launch Systems Insight Manager to verify that the trap was received.

**Setting event notification parameters**

For Rack and Power Manager to send an event alert to Systems Insight Manager, the alert notification for the event must be sent as an SNMP trap. Events can be individually configured through the Event Response Overview Screen for each CMC and UPS device being managed by Rack and Power Manager.

To set event notification parameters for a device, perform the following steps:

₁. **NOTE:** The following steps set event parameters for a CMC device. The steps for setting event parameters for UPS devices are virtually the same.

1. Launch Rack and Power Manager. In the top frame of the main screen, click the **Devices** icon.

2. Under CMC Devices, select **Event Response**. The Event Response Overview screen appears as shown in Figure 9, with a listing of all events available from the CMC device and the method of alert notification. For an event to result in a trap being sent to Systems Insight Manager, there must be a check mark in the SNMP column for that event.

![Figure 9. HP RPM Event Response Overview screen](image)

<table>
<thead>
<tr>
<th>Supported Events</th>
<th>Alert Notifications</th>
<th>Computer Command</th>
<th>Device Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Email</td>
<td>Broadcast</td>
<td>SNMP</td>
</tr>
<tr>
<td>Aux 1 Alarm</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Aux 1 Cleared</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Aux 2 Alarm</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Aux 2 Cleared</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Connection lost to device</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Device connected</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Event settings change</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Failed to connect to device</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Humidity Above Maximum</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Humidity Below Minimum</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Humidity Normal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input 1 Closed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input 1 Opened</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input 2 Closed</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input 2 Opened</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input 3 Closed</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input 3 Opened</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input 4 Closed</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input 4 Opened</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lockset 1 Error</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lockset 1 Failed To Lock</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

3. To edit the response of a particular event, click on the hyperlink of the desired event in the **Description** column. The Event Response screen is displayed and allows you to select the method of alert notification for that event.
4. Select **SNMP traps** as the alert notification method for the event. Note that all three methods (email, broadcast, SNMP traps) can be enabled.

5. Return to the Event Response Overview screen and repeat steps 3 through 5 for all events to be sent to HP SIM. To edit the response parameters for a different device of the same type (another CMC, for example), click the arrow for the **Copy Event Configuration from** drop-down box and select the next device. To edit the response parameters for a different type of device (for a UPS instead of a CMC), return to the main Devices screen. Under UPS Devices, select **Event Response**.

**Conclusion**

HP Systems Insight Manager, HP Power Manager, and HP Rack and Power Manager can be used in concert to provide a powerful management solution for enterprise systems. The ability of these applications to provide status and reactionary monitoring of rack wellness maximizes enterprise management by allowing minimal intervention of IT staff.
For more information

For more information on ProLiant servers, visit www.hp.com/servers/proliant.
Learn more about optional rack features at www.hp.com/products/rackoptions.
Learn more about ProLiant server power protection and management at www.hp.com/products/ups.
For information about the Insight Management Suite of products, visit www.hp.com/servers/manage.

Call to action

To help us better meet your needs for ISS technology information, please send comments about this paper to: TechCom@HP.com.