

HP Insight Power Manager

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Software Technical Support and Update Service

This section provides technical support information for Insight Control Management suites.

HP offers a number of software support services, many of which are provided to our customers at no additional charge.

Insight Control suites and select ProLiant Essentials software products include one year of 24 x 7 HP Software Technical Support and Update Service. This service provides access to HP technical resources for assistance

in resolving software implementation or operations problems. The service also provides access to software updates and reference manuals either in electronic form or on physical media as they are made available from HP.

Customers who purchase an electronic license to use are eligible for electronic updates only. With this service, Insight Control and ProLiant Essentials customers will benefit from expedited problem resolution as well as proactive notification and delivery of software updates. For more information about this service, see <http://www.hp.com/services/insight>.

If you received a license entitlement certificate, registration for this service will automatically take place upon redemption of the license certificate/key online and a service contract will be created for you.

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- **Warranty-** HP will replace defective delivery media for a period of 90 days from the **date of purchase**. This warranty applies to all Insight Control Management, HP Systems Insight Manager, and ProLiant Essentials products.
- **Join the discussion-** (<http://forums.itrc.hp.com>) - The HP Support Forum is a community-based, user-supported tool for HP customers to participate in discussions among customers about HP products. For discussions related to Insight Control and ProLiant Essentials software, click **Management software and system tools** area.
- **Software and Drivers download pages** - Provides latest software and drivers for your ProLiant products.
- **Management Security-** (<http://isscompetitive.corp.hp.com/management.html>) - HP is proactive in its approach to the quality and security of all its management software. Be sure to check this website often for the latest downloadable security updates.
- **Obtain the latest SmartStart Release-** (<http://h18013.www1.hp.com/products/servers/management/smartstart/index.html>) - The SmartStart, Management, and Firmware CDs are now freely available for download following a simple registration from the SmartStart web site. If you wish to receive physical kits with each release, you can order single release kits from the SmartStart web site. To receive proactive notification when SmartStart releases are available, subscribe to Subscriber's Choice at <http://www.hp.com/go/subscriberschoice>.

HP Worldwide Customer Service contact numbers are available at <http://www.hp.com/country/us/en/wwcontact.html>.

Where to go for additional help

In addition to this guide, the following resources are available:

Software Update Manager - <http://www.hp.com/go/ipm>

Support for HP SIM - <http://www.hp.com/country/us/en/wwcontact.htm>

Supported Servers - <http://www.hp.com/go/ipm>

Supported processors - <http://www.hp.com/servers/power-regulator>

Revision history

Revision History

Revision Version 1.40 December 2007

MPN: 435547-006. The sixth edition added new hardware and iLO firmware support.

Revision Version 1.30 November 2007

MPN: 435547-005. The fifth edition added support for Integrity c-class blades and entry-level servers.

Revision Version 1.20 July 2007

MPN: 435547-004. The fourth edition added graphing of c-Class enclosures, setting a Power Cap, updated CPU Performance Graph and setting the HP Power Regulator state on c-Class blades.

Revision Version 1.10 May 2007

MPN: 435547-003. The third edition added graphing of c-Class enclosures, setting a Power Cap, updated CPU Performance Graph and setting the HP Power Regulator state on c-Class blades.

Revision Version 1.0 March 2007

MPN: 435547-002. The second edition added a correction to the Hardware Support Matrix.

Revision Version 1.0 October 2006

2 Overview

HP Insight Power Manager (IPM), a plug-in to *HP Systems Insight Manager* (HP SIM), is an integrated power monitoring and management application that provides centralized control of server power consumption and thermal output. It extends the unified infrastructure management framework of HP SIM by providing new energy levers into the server. Leveraging HP Power Regulator technology, IPM makes policy-based power and thermal management possible. It expands the capacity of datacenters by reducing the amount of power and cooling required for supported ProLiant and Integrity servers and the BladeSystems c-Class.

IPM differs from other management applications in three key areas:

- **Automated power management.** With IPM, you can enter power management configurations. IPM automatically sends commands to appropriate systems for action. For example, you can configure multiple servers to be in Power Regulator mode or have a Power Cap setting simultaneously.
- **Operating system independence.** A hardware based solution, IPM supports all operating systems that are supported on ProLiant servers and BladeSystem c-Class enclosures. A list of these operating systems is available at <http://www.hp.com/go/supportos>.
- **Demonstrated power management savings.** IPM reduces the need to estimate the tangible benefits realized by using Power Regulator technology. IPM displays the monetary savings achieved in a convenient, easy-to-read format.

IPM enables you to:

- Graphically monitor and manage power consumption for a single server, a group of servers, a single c-Class enclosure, a group of c-Class enclosures or a mix of the above systems using a central user interface.
- Group systems logically and physically using native HP SIM collections and views grouping capabilities (for example Rack 42 or All Exchange Servers).
- Change the HP Power Regulator setting for one or many systems.
- Change the Power Cap setting for one or many systems.
- Review CPU performance including the performance impact of power saving technology.
- Chart inlet air temperature for a single server, a group of servers, a single c-Class enclosure, a group of c-Class enclosures or a mix of the above systems.
- Download historical data in CSV format to create highly customized data views.
- View dashboard analysis data, including power savings due to HP Power Regulator technology, for a single server or group of servers.
- Quickly and easily configure Power Regulator settings across multiple servers.

To access the IPM page, select **Reports**→**Insight Power Manager**.



NOTE: The **HP Insight Power Manager** section is also available through the **System tab for servers** section.

Related procedures

- [Report](#)
- [Configuring IPM with Insight Power Manager Options](#)
- [System tab for servers](#)

New features

New and changed information in this edition

These sections list what is new for the HP Insight Power Manager releases.

December 2007 release

Added new hardware and iLO2 firmware support.

Newly Supported Hardware

- ▲ BL870c

Added firmware support

- ▲ iLO2 1.50

Added support for collecting iLO license keys if they are not collected earlier provided IPM license is applied on the parent system.

November 2007 Release

Support for Integrity c-class blades and entry-level servers.

Newly Supported Hardware

Proliant

- BL680c G5 Server
- BLxw460 Workstation Blade

Integrity

- rx2660
- rx3600
- rx6600
- BL860c

May 2007 release

This release of HP Insight Power Manager provides the following functionality in addition to previous HP Insight Power Manager releases:

- Graphing c-Class enclosures, Power Consumption and Inlet Air Temperature data
- Setting a Power Cap (in Watts, Btu-hr or Percentage) on a single server or a collection of servers
- Updated CPU Performance Graph to show the impact of a Power Cap.
- Setting the HP Power Regulator state on c-Class blades (selected ML and DL servers were supported in HP IPM 1.0).

Understanding HP Power Regulator for ProLiant

HP Power Regulator for ProLiant is a hardware-level feature that enables ProLiant servers to save power - and thereby financial resources - by controlling the processor performance states (p-states) of the server CPUs. Insight Power Manager monitors and uses HP Power Regulator technology. Understanding HP Power Regulator technology helps you understand HP Insight Power Manager.

Power Regulator uses the processor p-states to change two key attributes that affect power consumption.

1. **CPU frequency:** Moving to a lower p-state causes the affected CPU to operate at a lower frequency. For example, a 3.773 GHz processor might operate at 3.0 GHz in a lower p-state.
2. **CPU voltage:** Moving to a lower p-state causes the affected CPU to operate at a lower level of voltage. For example, a CPU operating at 1.4v at maximum p-state might operate at 1.2v in the minimum p-state.

There are four modes in which Power Regulator can operate:

- **HP Static Low Power Mode.** In this mode, Power Regulator sets the processors to the lowest supported power state and forces the CPUs to stay in that lowest state. This mode saves the maximum amount of resources, but it might affect the system performance if processor utilization stays at or above 75% utilization.
- **HP Static High Performance Mode.** In this mode, Power Regulator sets the processors to the highest supported processor state and forces the CPUs to stay in that highest state. This mode ensures maximum

performance, but it does not save any resources. This mode can be useful for creating a baseline of power consumption data without Power Regulator.

- **HP Dynamic Power Savings Mode.** In this mode, Power Regulator sets the processors to the appropriate power level based on the utilization of each CPU core during the last 1/8 second. The CPU is set to the power saving processor p-state if the CPU is operating at a utilization level that can be completed at the slower CPU frequency. The CPU is set to the maximum performance processor p-state if the CPU is operating at a utilization level that requires the fastest CPU frequency.

The point at which Power Regulator shifts from the minimum p-state to the maximum p-state varies based on the processor installed in the system. A 3.773 GHz CPU that has a 3.0 GHz minimum p-state frequency switches modes at around 75% utilization. A 3.2 GHz CPU that has a 3.0 GHz minimum p-state frequency switches modes at around 88% utilization. It is the ratio of the maximum p-state compared to the minimum p-state, plus a small guard band, that determines the utilization at which the processor switches from minimum p-state to maximum p-state.

- **OS Control Mode.** In this mode, Power Regulator configures the server to enable the operating system to control the processor p-states. Moving from this state to any of the three previous states requires a server reboot.

The HP Power Regulator modes (Static Low, Static High and Dynamic) are independent of the operating system and work for any operating system. The OS Control Mode requires Microsoft Windows Server™ 2003 SP1 or later or Red Hat Linux® 4 Update 2 or later.

HP ProLiant servers with Intel® Xeon™ 5000, 5100 or 7xxx sequence processors support all four Power Regulator modes. HP ProLiant servers with AMD Opteron™ model 22xx processors support the HP Static Low Power Mode and the OS Control Mode. For more information on HP Power Regulator, including supported processors, visit <http://www.hp.com/servers/power-regulator>.

Related topics

- ▲ [Overview](#)

Understanding HP Power Regulator for Integrity

Whereas power monitoring operates independently of the operating system, HP Power Regulator for Integrity always requires a compliant operating system version. Consult the operating system documentation for details on the level of power management support available on your system. Power regulation also requires p-state capable hardware.

There are four modes in which Power Regulator for Integrity can operate:

- **HP Static Low Power Mode.** In this mode, Power Regulator for Integrity sets the processors to the power-performance state (p-state) with the lowest power consumption and forces them to stay in that state. This mode saves the maximum amount of resources, but it might affect the system performance if processor utilization stays at or above 75% utilization.
- **HP Static High Performance Mode.** In this mode, Power Regulator for Integrity sets the processors to the p-state with the highest performance and forces them to stay in that state. This mode ensures maximum performance, but it does not save any resources. This mode can be useful for creating a baseline of power consumption data without Power Regulator for Integrity.
- **HP Dynamic Power Savings Mode.** Allows the system to dynamically change processor p-states when needed based on current operating conditions. The implementation of this mode is operating system specific, so consult your operating system documentation for details.
- **OS Control Mode.** In this mode, Power Regulator for Integrity configures the server to enable the operating system to control the processor p-states. Use this setting to put your Operating System (including OS-hosted applications) in charge of power management.



NOTE: Moving to or from this state does not require a reboot of Integrity servers.

The HP Power Regulator for Integrity modes are available on supported platforms equipped with Dual-Core Intel Itanium Processor 9100 series 1.6 GHz dual-core parts.

Related topics

▲ Overview

Understanding HP Power Regulator savings

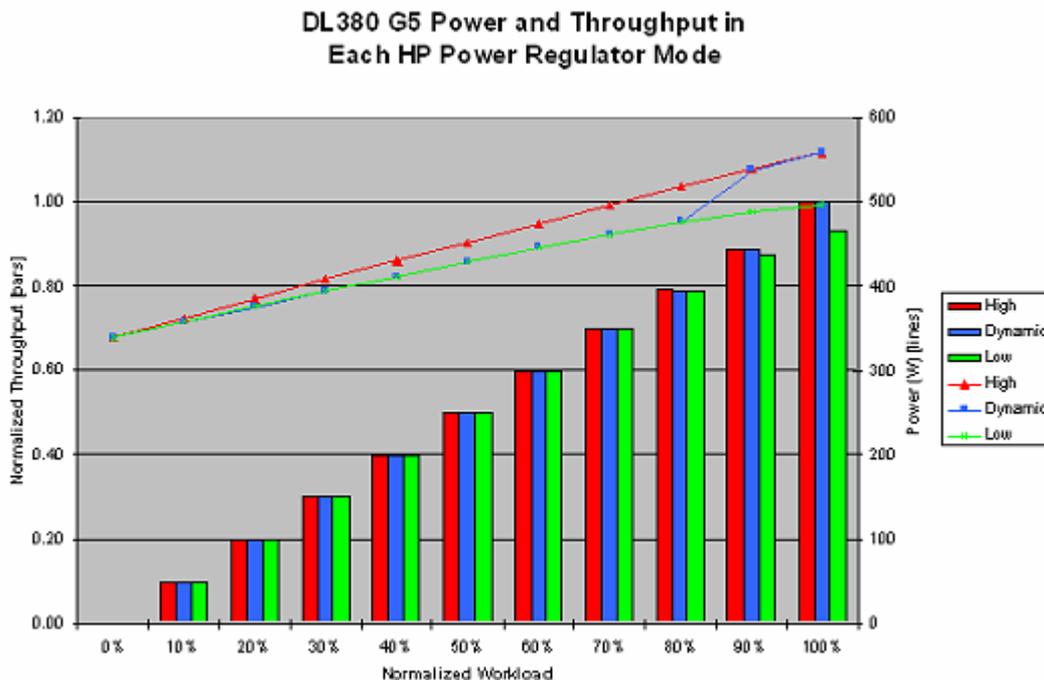
Server power consumption savings from HP Power Regulator

The resources saved by HP Power Regulator vary significantly from server to server, based on each server configuration and utilization.

The amount of server power consumption depends on utilization. A server with busy processors consumes more power than a server with idle processors. At the discretion of the operating system, modern Intel and AMD processors are put into a halt state when the operating system is idle. When halted, the CPU consumes minimal power resources. An idle server with halted processors cannot perform any tasks.

Power Regulator saves more resources on servers that are more highly utilized. As power consumption increases at higher workloads, Power Regulator saves more power.

The following figure shows power consumption and throughput at various workloads for each HP Power Regulator state. The server used in this test is an HP ProLiant DL380G5 with two Intel Xeon 5080 CPUs. The line chart, using the y-axis on the right side of the graph, shows watts consumed. The bar chart, using the y-axis on the left side of the graph, shows relative workload accomplished.



Analysis of power consumption lines

In the preceding figure, the red line shows power consumption in HP Static High Performance Mode. In HP Static High Performance Mode, the power consumption ranges from 339 W in an idle state to 558 W at 100% utilization. This is an example of power consumption without the benefit of Power Regulator technology.

The green line shows power consumption in HP Dynamic Power Savings Power Mode. In HP Static Low Power Mode, the power consumption ranges from 339 W at idle to 475 W at 80% utilization and to 497 W at 100% utilization.

The blue line shows power consumption in HP Static Low Power Mode. In HP Static Low Power Mode, the power consumption ranges from 339 W in an idle state, to 475 W at 80% utilization, and to 558 W at 100% utilization.

An idle server consumes exactly the same amount of power (339 W) regardless of the Power Regulator mode.

Additionally, the power consumed in HP Dynamic Power Saver Mode matches the power consumed in HP Static Low Power Mode from idle to 80% utilization because this system is running in the lower processor p-state from idle to 80% utilization when it is in the Dynamic Mode. In Dynamic Mode, after 80% utilization, this system shifts into the highest processor p-state and the power consumption for 90% and 100% workload, and matches the power consumption in HP Static High Performance Mode.

The line graphs show that the power saved by HP Dynamic Power Savings Mode increases as the workload approaches 80% utilization. If the system is configured for HP Static Low Power Mode, then it continues to save increasing amounts of power up to 100% utilization.

The wider the gap between the red line and the blue or green line, the more power is being saved.

Analysis of throughput bars

In the preceding figure, throughput is normalized in a manner such that a 1.00 throughput represents the maximum work that can be accomplished by a server regardless of the Power Regulator mode the server is in. All other throughputs are relative to this 1.00 value.

The red bar shows the normalized throughput (or work accomplished) in HP Static High Performance Mode. In HP Static High Performance Mode, the relative throughput ranges from no throughput in an idle state up to 1.00 at 100% utilization. This is an example of the relative throughput without the benefit of Power Regulator technology.

The green bar shows the normalized throughput in HP Static Low Power Mode. In HP Static Low Power Mode, the throughput ranges from no throughput in an idle state to 0.79 at 80% utilization, and to 0.93 at 100% utilization.

The blue bar shows the normalized throughput in HP Dynamic Power Savings Mode. In HP Dynamic Power Savings Mode, the throughput ranges from no throughput in an idle state to 0.79 at 80% utilization, and to 1.00 at 100% utilization.

The normalized throughput for all three Power Regulator modes is identical up to an 80% workload. This indicates that the workload can be completed at either the higher processor p-state (HP Static High Performance Mode) or the lower processor p-state (HP Static Low Power Mode/HP Dynamic Power Savings Mode). At a 90% to 100% normalized workload, the HP Static Low Power Mode has insufficient CPU cycles at the lower processor p-state to complete the normalized workload that can be accomplished at the higher p-state.

Conclusion

The previous figure illustrates:

1. HP Static Low Power Mode and HP Dynamic Power Savings Mode save resources when compared to no power management or HP Static High Performance Mode.
2. HP Static Low Power Mode saves the most resources at full utilization, but still can have some impact on system performance at the highest levels of utilization.
3. HP Dynamic Power Savings Mode saves the most resources at the workload level just before it switches to the higher processor p-state.
4. HP Dynamic Power Savings Mode delivers exactly the same level of performance as no power management or HP Static High Performance Mode.
5. Power Regulator technology saves resources on servers that are busy rather than those that are idle.

Reducing cooling power with HP Power Regulator

Power consumed by the server becomes heat that must be extracted by the data center. In addition to the power consumed directly by the server, the data center also uses power to extract the heat exhausted by the server. The previous figure illustrates estimates that for each watt consumed directly by the server requires another 1.0 to 1.5 W of energy from environmental control system of the data center to cool the server. Correspondingly, reducing power consumption on the server also reduces the air conditioning requirements for the server.

The HP Insight Power Manager includes an estimate of the cooling costs saved in the analysis section of the Power Consumption and CPU Performance graphs.

Savings from avoiding data center expansion and construction

According to an internal HP study, new data center construction costs an average of \$22,000 per square foot. Using the HP Insight Power Manager application can help you to correctly determine if your existing data center has capacity for additional servers. Using HP Insight Power Manager to avoid or even simply delaying new data center construction can save your company thousands of dollars.

Related topics

▲ [Overview](#)

3 Getting started



IMPORTANT: The following steps assume HP Systems Insight Manager (HP SIM) is successfully installed on the *Central Management Server* (CMS) and Discovery has run.

To start using the HP Insight Power Manager (IPM), use the following steps as a guideline for setting up and configuring your environment properly:

1. Ensure that your CMS has discovered supported systems with power management capabilities. For a list of supported systems, see “Supported hardware and software” or you can visit <http://www.hp.com/go/ipm> for the latest listing of supported servers. On the right side of the screen, select **Support & Documents**. Under **Resources for HP Insight Power Manager Software**, select **Manuals**. Under **General reference**, select **HP Insight Power Manager Support Matrix**.
2. Enable IPM by selecting **Options**→**Insight Power Manager Options**. Then, select **Enable Insight Power Manager Plug-In** check box, and click **Apply**. See “Configuring IPM with Insight Power Manager Options” for more information about enabling IPM.
3. Configure security access and apply security credentials. The IPM plug-in must be configured with access credentials (login name and password) for the Integrated Lights-Out 2 (iLO 2) and *Onboard Administrator* (OA) management systems in the servers/enclosures being managed. For more information, see “Configuring IPM with Insight Power Manager Options”.
4. Install *Integrated Lights-Out* (iLO) Advanced or Select license on managed systems. For more information, see www.hp.com/servers/ilo.
5. Ensure Integrated Lights-Out and *Onboard Administrator* management systems in the servers/enclosures being managed have login name/password settings that match the access credentials configured in step 3.
6. Install the IPM license with security credentials on a CMS to enable IPM data collection. See “Licensing IPM”. For more information, see <http://www.hp.com/go/ipm>.



NOTE: You must have security credentials on the CMS to enable IPM.

NOTE: You must run Discovery to discover and identify the systems and to associate the iLO/Onboard Administrator to the appropriate systems.

7. Refresh the data. See “Report” for more information about refreshing the data.

Related procedures

- Getting started
- Configuring IPM with Insight Power Manager Options

Related topics

- ▲ System tab for servers

Supported hardware and software

HP Insight Power Manager (IPM) manages targets that contain iLO 2 and power meter support. The following systems are the initial target systems that IPM is supported for monitoring.

Supported hardware



NOTE: For an updated list of IPM supported systems, see <http://www.hp.com/go/ipm>. On the right side of the screen, select **Support & Documents**. Under **Resources for HP Insight Power Manager Software**, select **Manuals**. Under **General reference**, select **HP Insight Power Manager Support Matrix**.

- ProLiant ML350 G5
- ProLiant ML370 G5

- ProLiant DL360 G5
- ProLiant DL380 G5
- ProLiant DL365
- ProLiant DL385 G2
- ProLiant BL460c
- ProLiant BL480c
- ProLiant BL465c
- ProLiant BL680c G5
- ProLiant BL685c
- ProLiant BL xw460c Workstation Blade
- HP Integrity BL860c
- HP Integrity BL870c
- HP Integrity rx2660
- HP Integrity rx3600
- HP Integrity rx6600
- Blade System c7000
- Blade System c3000

Required HP firmware

IPM requires the following HP firmware:

- ProLiant Integrated Lights-Out 2 v1.20 (for measurement and reporting) or v1.30 (for Thermal Cap support and changing the HP Power Regulator Mode on c-Class blades).
- Onboard Administrator v1.20 (for c-Class enclosure measurement and reporting) or v1.30 (to update Power Regulator settings on BladeSystem c-Class server blades).
- ProLiant BIOS - System ROM dated 1 May 2007 or later (for Thermal Cap support on ML350 G5, DL360 G5, ML370 G5, DL380 G5, BL460c, BL480c).
- System BIOS
 - System ROM dated 1 May 2007 or later is required to support Power Capping on the ProLiant ML350 G5, DL360 G5, ML370 G5, DL380 G5, BL460c, and BL480c servers.
 - System ROM dated 31 July 2007 or later is required to support Power Cap on the ProLiant BL xw460C workstation.

Supported software

IPM supports the following software:

- Supported operating systems
- Supported web browsers
- Host Operating System Platforms for Central Management Server (HP SIM)
- Host Database for Central Management Server (HP SIM)

Supported operating systems

The following HP SIM *Central Management Server* (CMS) operating systems are supported by IPM:

- Integrity Client Operating Systems
 - Monitoring: all Integrity operating systems.
 - Regulation: HP-UX 11.31 with patches PHKL 36654, PHKL 37031, PHKL 37032, PHKL 36477, PHKL 36478, other operating systems to be announced.
- Microsoft Windows®
- Linux®
- HP-UX®
- This product is operating system independent and will work with any HP SIM supported operating system. For details see the operating system support matrix for the system in use.

Supported web browsers

The following web browsers are supported by the HP Systems Insight Manager CMS:

- For Windows:
 - Internet Explorer 6.0 with Service Pack 2 or later
 - Internet Explorer 7
 - Firefox 1.5 or later
- For HP-UX:
 - Firefox 1.5 or later
- For Linux:
 - Firefox 1.5 or later

Host Operating System Platforms for Central Management Server (HP SIM)

- Microsoft© Windows©
- Linux
- HP-UX
- (For specific versions see the support matrix for HP Systems Insight Manager 5.2)

Host Database for Central Management Server (HP SIM)

- ▲ This product supports all databases supported by HP SIM. For details see support matrix for HP Systems Insight Manager 5.2

Related procedures

- [Report](#)
- [Configuring IPM with Insight Power Manager Options](#)

Related topics

- ▲ [System tab for servers](#)

Licensing IPM

HP Insight Power Manager (IPM) adds the advanced power management feature for individual servers onto the *Integrated Lights-Out* (iLO) . Licenses for Insight Power Manager and iLO Advanced or iLO Select are required for proper operation within *HP Systems Insight Manager* (HP SIM).



NOTE: IPM licenses are not required to view power and thermal graphs for c-Class enclosures.

Purchasing additional IPM licenses

IPM licenses can be purchased from the following:

- HP configure to order
- HP Software Depot
- HP Small and Medium Business (SMB) Store
- HP resellers

To purchase licenses:

1. Navigate to <http://www.hp.com/go/ipm>
2. Click **Buy** to access the SMB store. The licenses are available from the SMB store.
3. Click **How to buy** for instructions about purchasing licenses for HP Insight Power Manager through one of the following types of SKUs:
 - **Insight Power Manager.** The Insight Power Manager SKU provides a license for IPM.
 - **iLO Power Management Pack.** The iLO Power Management Pack SKU contains an IPM and a ProLiant iLO Advanced or iLO Select license.



NOTE: Integrity iLO keys may be purchased separately.

- **Insight Control Environment.** Insight Control Environment SKU includes licenses for the HP ProLiant Essentials Rapid Deployment Pack (RDP), HP ProLiant Essentials Vulnerability and Patch Management Pack (Vulnerability and Patch Management Pack), HP ProLiant Essentials Performance Management Pack (PMP), Integrated Lights-Out (iLO) Advanced and HP Insight Power Manager (IPM).

Managing IPM license keys



NOTE: The following procedure assumes you have already installed HP SIM.

To use License Manager to manage keys:

1. Select **Deploy**→**License Manager**. The following information is displayed for each licensed product:
 - **Product.** The name of the product.
 - **Licensed Systems.** The number of systems licensed to use the product.
 - **Licenses (Select 'Manage Licenses' for detail).** The total number of licenses in the License Manager database for the product.
2. Select **Add New Product**. The **Manage Licenses** section appears.
3. Click **Add Licenses**. The **Add License** section appears.
4. In the **Specify a key string** field, enter the license key that you purchased or obtained from the Insight Control Management DVD and click **Open**. The system is licensed and the **Key details** sections displays the **Product, License Version, License Type, Licenses Purchased** and **Days Max**.
5. Click **Add Licenses Now**. A dialog box appears indicating the key has been added. Click **OK**. The new key appears under **Product License Information**.



NOTE: To add more licenses, click **Add Licenses Now** and repeat this procedure.

NOTE: See [License Manager](#) for more information.

Licensing IPM managed systems

If a server is not currently licensed, a prompt appears when you access **Reports→Insight Power Manager** or **Options→Insight Power Manager Options** indicating that licenses are not installed. You must install a license to use IPM.

To install an IPM license from an IPM report or option page:

1. Select the IPM servers to be licensed from the **Systems and Events** panel.
2. Click **Reports→Insight Power Manager** or **Options→Insight Power Manager Options**. The **Step 1** page appears with the **Status** indicating the server is not licensed.
3. Select the server to be licensed and click **Apply License**. The **Step 2: License unlicensed systems (optional)** page appears indicating the number of license remaining.
4. Click **Next**. The Insight Power Manager page appears.

Related procedures

- [Report](#)
- [Configuring IPM with Insight Power Manager Options](#)

Related topics

- ▲ [System tab for servers](#)

4 Configuring IPM with Insight Power Manager Options

Use **Insight Power Manager Options** to configure HP Insight Power Manager (IPM) settings and display options.

With the **Insight Power Manager Options** you can:

- Enable or disable *HP Insight Power Manager* capabilities on managed systems. If disabled, no network activity related to gathering power data is performed. This setting is global.
- Configure up to five user name and password pairs for access to the management processors of the managed systems. You can also configure an alternate SSL port number. This setting is global.



NOTE: The default setting is 443.

- Configure a designated time range to keep historical data. The data is deleted automatically after the specified timeframe has elapsed. This setting is global.
- Indicate whether to display temperature in Celsius or Fahrenheit. This setting is individualized for every user.
- Indicate whether to display power consumption in watts or Btu/hr. This setting is individualized for every user.

To configure IPM options:

1. Click **Options**→**Insight Power Manager Options**. The **Insight Power Manager Options** page appears.
2. To enable HP Insight Power Manager, select **Enable HP Insight Power Manager Plug-In**.
3. The **Graph and Analysis Settings** section provides the following options:
 - **Temperature Unit of Measurement.** Select a unit of measurement for the temperature from the dropdown list. This setting is individualized for every user.
 - **Power Unit of Measurement.** Select a unit of measurement for power from the dropdown list. This setting is for each user and different users can have different settings.
 - **Use GMT for all timestamps in the graphs.** Select this option if you want to use Greenwich Mean Time (GMT) when graphing data. This setting is per user and different users may specify different settings.
 - **Cost of Power per kWh.** Enter the average cost of power per kilowatt-hour. This field is used to calculate the cost of operation for the server and cooling. For ease of data entry, only one field is provided. The **Export** option in the Power Regulator Actions section of the graphs should be used if more cost analysis is required. This field is used to calculate the cost and annual cost of operation for the server and cooling. This setting is per user and different users may specify different settings.
 - **Currency Type.** Enter the currency type. This field is used for display purposes only and is used in the Analysis section of the graphs that display cost information. The default value is USD, but the value can be changed to \$, EUR, €, GBP, £, ITL, ¥, JPY, or any other printable character set that represents your currency. This setting is per user and different users may specify different settings.
 - **Cooling Multiplier.** Enter a cooling multiplier. This value represents the relative cost of cooling the server compared to the cost of powering the server. The default value of 1.5 indicates that it costs 1.5 as much to cool the server as it does to power the server. This value is multiplied by the server's kilowatt-hours used by the server to arrive at a cooling kilowatt-hours value that is used in the Analysis section of the graphs that display power consumption information. This setting is per user and different users may specify different settings.
 - **Power Line Voltage.** Select the power line voltage from the dropdown list. This field is used to calculate the amperage consumed in the Analysis section of the graphs that display power consumption information. This setting is per user and different users may specify different settings.

4. The **Default Integrated Lights Out (iLO) Settings** section enables you to configure a Secure Socket Layer (SSL) port number.

The following option is available:

- ▲ **Default SSL Port.** Enter the SSL port number to be used by IPM to communicate with iLO. The default is **443**.

5. The **Default Insight Power Manager Access Credentials** section enables you to configure user name and password pairs that will be used for Integrated Lights-Out 2 (iLO 2) and Onboard Administrator access.

The following options are available:

- **User Name.** Enter the user names used to connect to the iLO 2/Onboard Administrator for the managed systems. You can enter up to five user name and password pairs in the **Default 1-5** fields.
- **Password.** Enter the password for the iLO/Onboard Administrator of the managed system named previously.
- **Confirm password.** Re-enter the password for the iLO 2/Onboard Administrator of the managed system exactly as you entered it in the **Password** field.



NOTE: IPM tries each name and password pair on managed systems until it successfully accesses power data.

6. The **Default Power Regulator Data Expiration Settings** section enables you to configure how long to keep historical data.

In the first **Remove data older than** dropdown list, select the number that corresponds with a time span to be selected in the second dropdown list. For example, you could specify **Remove data older than 6 Month(s)**. All data that is six months or older is removed.

7. Click **Apply** to save your settings.

Related topics

- ▲ [Overview](#)

5 Report

Overview

The HP Insight Power Manager (IPM) report enables you to view the power and thermal utilization for a managed system or a collection of systems.

To access the HP Insight Power Manager reports:

1. Click **Reports**→**Insight Power Manager** . If you have already selected one or more target systems, the **Insight Power Manager** page appears, and you can omit steps 2 through 4.
- 2.
- 3.
4. Click **Run Now**. The **Insight Power Manager** page appears.

The HP Insight Power Manager report provides the following graph navigation features:

- Changing the time scale
- Refreshing the graph data
- Changing targets
- Displaying the previous page of data
- Displaying the next page of data

Changing the time scale

To change the time scale:

1. In the **Graphs** section, select a timeframe from the **Draw Graph** dropdown list. The default selection is **24 Hours**.
2. Click **Draw Graph**. The graph appears. The right side of the axis displays the current time and the left side displays historical information.

Refreshing the graph data

To reduce network impact, the IPM application gathers data from each server once per day. The **Refresh Data** button can be used to collect the latest data.

To refresh the data:

1. Select the licensed server. Click **Reports**→**Insight Power Manager**.
2. Click **Refresh Data** to retrieve the latest information from the server. The process of refreshing the data can take a couple of minutes.



NOTE: If *Integrated Lights-Out* (iLO) was recently licensed, minimal data is available because the data was not collected before the iLO Advanced license was applied. There is a minimum data collection timeframe of five minutes and a maximum of 24 hours.

Changing targets

You can change the selected targets currently displayed in the graph.

To change targets:

1. Click **Change Targets**. The **Step 1: Verify Target Systems** page appears.
- 2.
- 3.
4. Click **Run Now**. The **Insight Power Manager** page reappears with data from the new servers.

Displaying the previous page of data

IPM can display the previous page of data for the selected time scale. If the time scale is **24 Hours**, then a **Previous 24 Hours** link is displayed. If the time scale is 3 weeks, then a **Previous 3 Weeks** link appears.

To display the previous time scale of data:



NOTE: This example uses 24 hours as a time scale.

Under the graph, click the **Previous 24 Hours** link. The graph is updated to display the previous 24 hour timeframe for the selected systems.

Displaying the next page of data

IPM can display the next page of data for the selected time scale if you are currently reviewing previous historical data. If the time scale is **24 Hours**, then a **Next 24 Hours** link is displayed. If the time scale is 3 weeks, then a **Next 3 Weeks** link is displayed. If you are viewing the current data, this link is not available.

To display the next time scale of data:



NOTE: This example uses 24 hours as a time scale.

Under the graph, click the **Next 24 Hours** link. The graph is updated to display the next 24 hour timeframe for the selected systems.

Related topics

- [Overview](#)
- [Understanding HP Power Regulator for ProLiant](#)
- [Understanding HP Power Regulator for Integrity](#)
- [Understanding HP Power Regulator savings](#)

Graph options for a single server or c-Class enclosure

The HP Insight Power Manager page provides the following graph options when a single server or a single c-Class enclosure is selected:

- [Power consumption](#)
- [CPU performance](#)
- [Inlet air temperature](#)

Power consumption

The **Power Consumption** graph displays the amount of power that has been consumed over the selected time scale by the selected system. The graph displays the **Average Power Consumption** and the **Peak Power Consumption**. The graph also displays a **Power Cap** line if a cap has been defined for the selected system.

The **Average Power Consumption** data points show the arithmetic mean for the power consumed over the time period represented by a single point on the graph. For the 24 hour graph, each point on the graph represents 5 minutes of power consumption data. The line formed by the **Average Power Consumption** data shows the steady-state power consumption of the server.

The **Peak Power Consumption** data points show the highest power consumption over the time period represented by a single point on the graph. The line formed by the **Peak Power Consumption** data shows the short-term spikes in power consumption.

The **Power Cap** data points show the value, in Watts or Btu-hr, of the limit on the average amount of power consumed by the system. **Power Cap** is only visible for those systems that support capping and have a **Power Cap** configured. The **Power Cap** is a limit on the **Average Power Consumption**. It is possible for **Peak Power Consumption** to exceed the **Power Cap**.



NOTE: The Power Consumption graph for a c-Class enclosure is the total amount of power the enclosure is using. This value includes the power consumption for all blades, interconnect devices, fans and power supplies in the enclosure.

To view the Power Consumption information:

1. Select a system from a collection.
 2. Click **Reports**→**Insight Power Manager** . The **Insight Power Manager** page appears.
 3. Select **Power Consumption** from the graph type dropdown list. The **Power Consumption** information appears.
-



NOTE: The Power Consumption graph displays legend labels for each graph line.

The Analysis section of the Power Consumption graph displays key data and calculations in a tabular format. The data in the analysis section is for the time scale selected for the graph or an annual estimate. The time scale for the Analysis is noted in the header of the data table.

The following analysis information is displayed:

- **Average Power Consumption.** Displays the average power consumption for the selected system during the current time scale.
- **Peak Power Consumption.** Displays the peak power consumption for the selected system during the current time scale.
- **Power Supply Rating.** Displays the maximum amount of power that the power supply (or power supplies in a redundant configuration) can provide.
- **Low Power Cap Value.** Displays the Minimum Power Cap value for the selected system during the current time scale.
- **Peak Power Cap Value.** Displays the Maximum Power Cap value for the selected system during the current time scale.
- **Average Amps (at 220 V).** Displays the average amps for the selected system. This field is useful when comparing the amps consumed by a server or collection of servers to a particular circuit capacity. The volts value (220 V in this example) in this calculation comes from the **Options**→**IPM Options, Power Line Voltage** setting.
- **Kilowatt-hours.** Displays the energy consumed during the time scale of the graph in kilowatt-hours for the selected system.
- **Annual Kilowatt-hours Estimate.** Displays a projection of what the annual energy consumption would be if the selected system continued to consume energy at this average rate for a full year.
- **Estimated Cost (at USD 0.0874 per kWh).** Displays the estimated cost of powering the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options**. Cost of Power per kWh setting.
- **Annual Estimated Cost.** Displays a projection of what the annual cost to power the selected system would be if the selected system continues to consume energy at this average rate for a full year.
- **Cooling Kilowatt-hours.** Displays an estimate of the power required to cool the selected system during the time scale of the graph in kilowatt-hours. The Cooling Kilowatt-hours value is calculated by taking the Kilowatt-hours required to power the server and multiplying by the Cooling Multiplier from the **Options**→**Insight Power Manager Options, Cooling Multiplier** setting.
- **Estimated Cooling Cost (at USD 0.0874 per kWh).** Displays an estimate of the cost of the power required to cool the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options** settings.
- **Annual Estimated Cooling Cost.** Displays a projection of what the annual cooling cost would be if the selected system continued to consume energy at this average rate for a full year.

- **Estimate of Kilowatt-hours Saved.** Displays an estimate of the energy saved, for server power and cooling power, by HP Power Regulator technology for the selected system for the time scale of the graph. See “Understanding HP Power Regulator savings” for more information.
- **Estimate of Cost Savings (at USD 0.0874 per kWh).** Displays an estimate of the energy cost saved, for server power and cooling power, by HP Power Regulator technology for the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Annual Kilowatt-hours Saved Estimate.** Displays an estimate of the energy saved, for server power and cooling power, by HP Power Regulator technology for the selected system for a full year. See “Understanding HP Power Regulator savings” for more information.
- **Annual Cost Savings Estimate (at USD 0.0874 per kWh).** Displays a projection of what the annual cost saving would be (server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.



NOTE: Cost savings are not displayed for HP Integrity servers.

CPU performance

The CPU Performance graph displays historical CPU usage information for the selected system. The graph displays the CPU Utilization and the Average CPU Frequency.

The CPU Performance graph is only displayed when a single server is selected. This graph is not displayed when multiple servers are selected or for c-Class enclosures.

The CPU Utilization data points show the average utilization for all processor cores in the selected server over the time period selected. For the 24 hour graph, each point on the graph represents 5 minutes of CPU Utilization data. As the graph sample grows larger than 24 hours, the sample is condensed for readability. The line formed by the CPU Performance data displays the server activity.

CPU performance data for HP Integrity servers is obtained from the HP Utilization Provider running on the managed system. If data from this optional software is not available, the CPU Performance graph will be disabled.

The Average CPU Frequency data points show the average speed of the processor cores in the selected server over the time period selected. The frequency or speed of the server’s CPUs changes as the server changes processor *p-states* and as the CPUs execution state is changed to achieve the Power Cap. At a lower *p-state*, the CPU is slowed down and consumes less power. At a higher *p-state*, the CPU runs at a faster speed and consumes more power. See “Understanding HP Power Regulator for ProLiant” for more information on *p-states*. The Average CPU Frequency is also decreased as required to achieve the configured Power Cap.

CPU frequency changes are not displayed for Integrity servers. Instead, the rated CPU frequency is displayed.

To view the CPU Performance information:

1. Select a system from a collection.
2. Click **Reports→Insight Power Manager** . The **Insight Power Manager** page appears.
3. In the dropdown list next to **Refresh Data**, select **CPU Performance**. The CPU Performance information appears.



NOTE: The CPU Performance graph displays legend labels for each graph line.

The following analysis information is displayed for the time frame specified:

- **Percentage Time in Power Saving Mode.** Displays the percentage time the selected system was in a power saving mode for the current time scale. While in a power saving mode, the system was using less electricity and generating less heat by operating at a reduced CPU frequency and lower CPU core voltage.
- **Percentage Time in Maximum Performance Mode.** Displays the percentage time the selected system was in the maximum performance mode for the current time scale. While in the maximum performance mode, the system was operating at maximum CPU frequency and core voltage to deliver the highest levels of system performance.
- **Average Utilization.** Displays the average CPU utilization of all processor cores for the selected system for the current time scale.
- **Peak Utilization.** Displays the highest average CPU utilization of all processor cores for the selected system for the current time scale.
- **Maximum CPU Speed.** Displays the maximum speed of the CPUs for the selected system for the current time scale. This is the speed at which the CPUs will execute if power saving/power capping technology is not configured.
- **Average CPU Speed.** Displays the average CPU speed of all processor cores for the selected system for the current time scale. Shifting into power savings modes which reduce the CPU frequency reduces the average CPU speed of the system. A system in **HP Static High Performance Mode** with no **Power Cap** configured, has an Average CPU Speed equal to the full GHz of the system's CPUs. A system in **HP Static Low Power Mode** has an Average CPU Speed equal to the slowest GHz supported for the system's CPUs. A system in **HP Dynamic Power Saver Mode** has an Average CPU Speed between the full GHz and the slowest GHz – the busier the system the closer to full GHz. A system with a **Power Cap** configured has an Average GHz that varies based on the level of the **Power Cap**. Average CPU Speed is not calculated for systems in **OS Control Mode**.
- **Estimated Cost (at USD 0.0874 per kWh).** Displays the estimated cost of powering the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Annual Estimated Cost.** Displays a projection of what the annual cost to power the selected system would be if the selected system continued to consume energy at this average rate for a full year.
- **Cooling Kilowatt-hours.** Displays an estimate of the power required to cool the selected system during the time scale of the graph in kilowatt-hours. The Cooling Kilowatt-hours value is calculated by multiplying the Kilowatt-hours required to power the server by the Cooling Multiplier from the **Options→Insight Power Manager Options, Cooling Multiplier** setting.
- **Annual Cooling Kilowatt-hours Estimate.** Displays a projection of what the annual cost savings would be (server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year.
- **Estimated Cooling Cost (at USD 0.0874 per kWh).** Displays an estimate of the cost of the power required to cool the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Annual Estimated Cooling Cost.** Displays a projection of what the annual cooling cost would be if the selected system continued to consume energy at this average rate for a full year.
- **Estimate of Kilowatt-hours Saved.** Displays an estimate of the energy saved (server power and cooling power) by HP Power Regulator technology for the selected system for the time scale of the graph. See "Understanding HP Power Regulator savings" for more information.
- **Estimate of Cost Savings (at USD 0.0874 per kWh).** Displays an estimate of the energy cost saved, for server power and cooling power, by HP Power Regulator technology for the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power

per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.

- **Annual Kilowatt-hours Saved Estimate.** Displays an estimate of the power saved (both server power and cooling power) by HP Power Regulator technology for the selected system for a full year. See “Understanding HP Power Regulator savings” for more information.
- **Annual Cost Savings Estimate (at USD 0.0874 per kWh).** Displays a projection of what the annual cost saving would be (server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.



NOTE: Cost savings are not displayed for HP Integrity servers.

Inlet air temperature

The Inlet Air Temperature graph displays historical inlet air temperature information for the selected system. The graph displays the Average Temperature and the Average Temperature Trend.

The Average Temperature data points show the average temperature of the air entering the selected server over the time period represented requested. For the 24 hour graph, each point on the graph represents 5 minutes of temperature data. As the graph sample grows larger than 24 hours, the sample is condensed for readability.

The Average Temperature Trend shows if the average air inlet temperature for the selected server is rising or falling.

To view the Inlet Air Temperature information:

1. Select a system from a collection.
2. Click **Reports→Insight Power Manager** . The **Insight Power Manager** page appears.
3. Select **Inlet Air Temperature** from the graph type dropdown list. The **Inlet Air Temperature** information appears.



NOTE: The Inlet Air Temperature graph displays legend labels for each graph line.

The following analysis information is displayed for the time frame specified:

- **Average Inlet Air Temperature.** Displays the average inlet air temperature for the selected system during the current time scale.
- **Maximum Inlet Air Temperature.** Displays the maximum inlet air temperature for the selected system during the current time scale.
- **Minimum Inlet Air Temperature.** Displays the minimum inlet air temperature for the selected system during the current time scale.
- **Temperature Trend.** Displays the temperature trend for the selected system.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.

Related topics

- Overview
- Understanding HP Power Regulator for ProLiant
- Understanding HP Power Regulator for Integrity
- Understanding HP Power Regulator savings

Graph options for multiple servers or c-Class enclosures

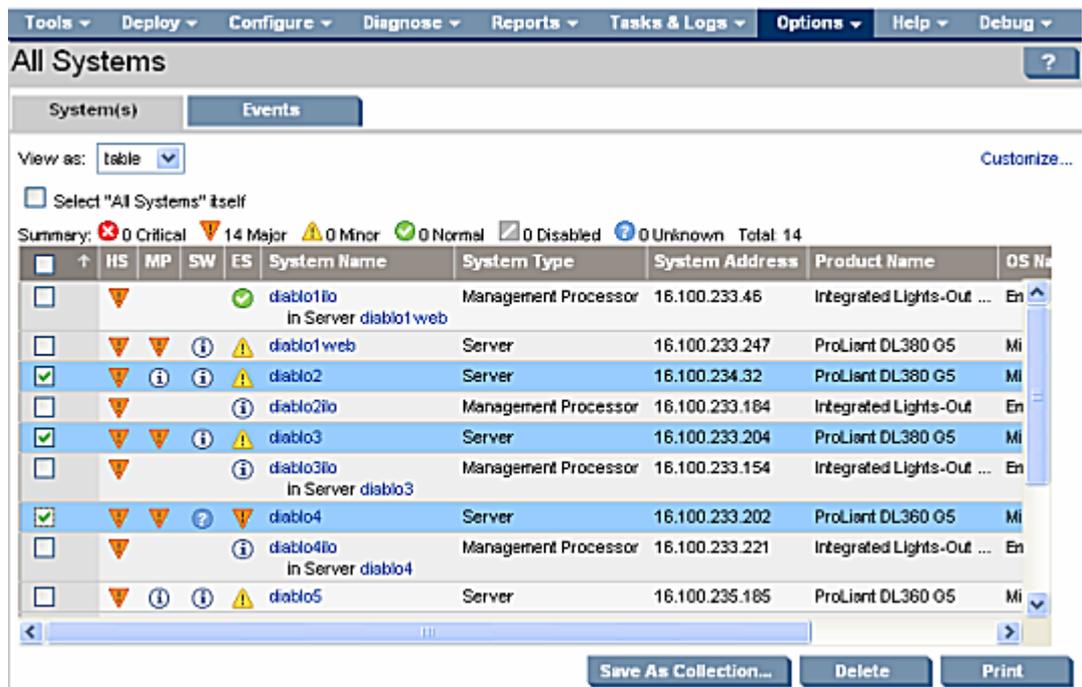
If multiple systems are selected, the group power consumption, group power consumption breakdown (including one line for each system), group inlet air temperature, and group inlet air temperature breakdown graphs are available. The CPU Performance graph does not apply if multiple systems are selected.

The HP Insight Power Manager page provides the following graph options when multiple servers are selected:

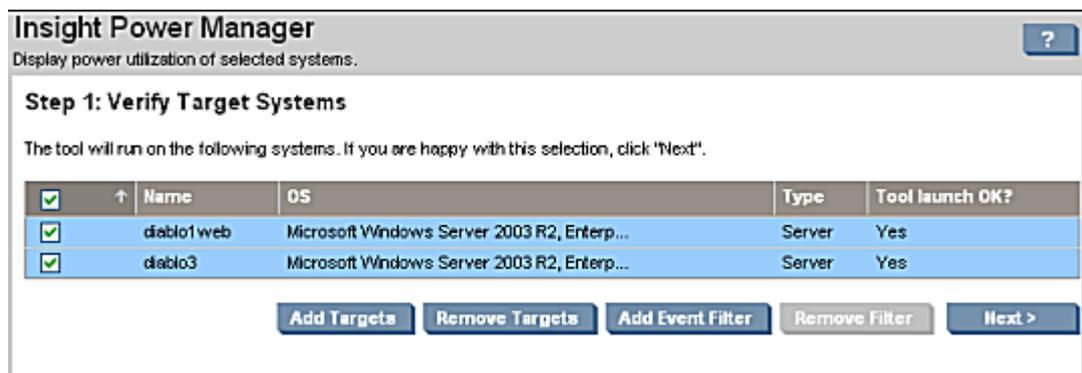
- Group power consumption
- Group power consumption breakdown
- Group inlet air temperature
- Group inlet air temperature breakdown

To select multiple systems, use one of the following methods:

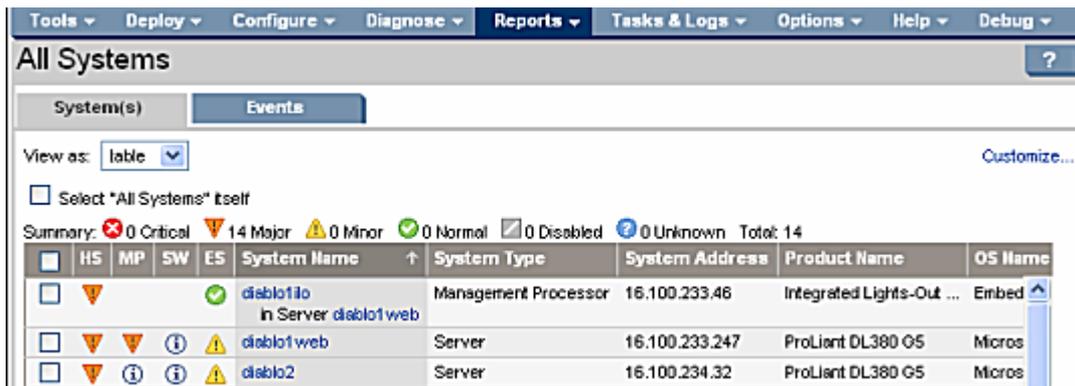
- Select one to many systems in the HP SIM Table View, and select **Reports**→**Insight Power Manager** from the menu.



- With no servers selected, select **Reports**→**Insight Power Manager** from the menu and choose your systems from the **Select Target Systems** dialog box.



- Select a previously defined collection of systems and select **Reports**→**Insight Power Manager** from the menu.



- To add or delete targets from the currently selected list of systems, click **Change Targets** from the Insight Power Manager screen.



Group power consumption

The **Group Power Consumption** graph displays a summation of the power that has been consumed over the selected time scale by the selected systems. The graph displays both the **Power Consumption** and the **Peak Power Consumption**.

The **Power Consumption** data points show a breakdown of the average power consumed by the group of systems over the time period represented by a single point on the graph. For the 24 hour graph, each point on the graph represents 5 minutes of power consumption data. The line formed by the **Average Power Consumption** data shows the steady-state power consumption of the group of systems.

The **Peak Power Consumption** data points show the breakdown of the highest power consumption by the group of systems over the time period represented by a single point on the graph. The line formed by the **Peak Power Consumption** data shows the short-term spikes in power consumption by the group of systems. It is important to note that this method of calculating **Peak Power Consumption** for the group of systems is conservative, because it assumes that all systems within the group consumed their peak power simultaneously. The actual peak of the power consumption for the group of systems could be significantly less, if the individual systems within the selected group did not consume their individual peak power at the same instant within the sample period.



NOTE: If the group of systems to be graphed includes a c-Class enclosure and the blades in that enclosure, then IPM will remove these blades from the selected targets to ensure that the power consumed by the blades is not included twice in the summation of **Group Power Consumption**.

To view the **Group Power Consumption** information:

1. Select multiple systems from a collection.
 2. Click **Reports**→**Insight Power Manager**. The **Insight Power Manager** page appears.
-



NOTE: The **Group Power Consumption** information appears by default.

NOTE: The **Group Power Consumption** graph displays legend labels for each graph line.

The Analysis section of the Power Consumption graph displays key data and calculations in a tabular format. The data in the analysis section is either for the time scale selected for the graph or an annual estimate. The time scale for the Analysis is noted in the header of the data table.

The following analysis information appears for the time frame specified:

- **Group Average Power Consumption.** Displays the summation of average power consumption breakdown for the group of selected systems during the current time scale.
- **Group Peak Power Consumption.** Displays the highest point of the summation of peak power consumption for the selected systems during the current time scale.
- **Group Average Amps (at 220 V).** Displays the summation of average amps consumed for the selected systems for the time scale. Use this field to compare the power consumption of the selected systems to a particular circuit size. The volts value (220 V in this example) in this calculation comes from the **Options**→**Insight Power Manager Options, Power Line Voltage** setting.
- **Group Kilowatt-hours.** Displays a projection of what the annual energy consumption would be if the selected system continued to consume energy at this average rate for a full year.
- **Group Annual Kilowatt-hours Estimate.** Displays a projection of the what the annual energy consumption would be if the selected systems continued to consume energy at this average rate for a full year.
- **Group Estimated Cost (at USD 0.0874 per kWh).** Displays the estimated cost of powering the group of selected systems for the time scale on the graph. The Currency Type designator (USD in this example) and the Cost of Power per kWh (0.0874 in this example) used in this calculation is provided from the **Options**→**Insight Power Manager Options** settings.
- **Group Annual Estimated Cost.** Displays a projection of what the annual cost to power the selected system would be if the selected systems continued to consume energy at this average rate for a full year.
- **Group Annual Estimated Cooling Cost.** Displays a projection of what the annual cooling cost would be if the selected system continued to consume energy at this average rate for a full year.
- **Group Cooling Kilowatt-hours.** Displays an estimate of the power required to cool the group of selected systems during the time scale of the graph in kilowatt-hours. The Cooling Kilowatt-hours value is calculated by taking the Kilowatt-hours required to power the server and multiplying by the Cooling Multiplier from the **Options**→**Insight Power Manager Options, Cooling Multiplier** setting.
- **Group Estimated Cooling Cost (at USD 0.0874 per kWh).** Displays the estimated cost of the power required to cool the group of selected systems for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options** settings.
- **Group Annual Kilowatt-hours.** Displays an estimate of the power required to cool the group of selected systems for a full year in kilowatt-hours.
- **Group Annual Estimated Cooling Cost.** Displays a projection of what the annual cooling cost would be if the selected systems continued to consume energy at this average rate for a full year.
- **Estimate of Kilowatt-hours Saved.** Displays an estimate of the energy saved (both server power and cooling power) by HP Power Regulator technology for the group of selected systems for the time scale of the graph. See “Understanding HP Power Regulator savings” for more information.

- **Estimate of Cost Savings (at USD 0.0874 per kWh).** Displays an estimate of the energy cost saved, for server power and cooling power, by HP Power Regulator technology for the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Annual Kilowatt-hours Saved Estimate.** Displays a projection of what the annual cost saving would be (both server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year. See “Understanding HP Power Regulator savings” for more information.
- **Annual Cost Savings Estimate (at USD 0.0874 per kWh).** Displays a projection of what the annual cost saving would be (server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Server with Highest Average Consumption.** Displays the name of the server in the group of selected systems with the highest average consumption.
- **Server with Highest Peak Consumption.** Displays the name of the server in the group of selected systems with the highest peak consumption.
- **Theoretical Collection Peak.** Displays the summation of the Peak Consumption values for all of the selected systems. The Theoretical Collection Peak represents the maximum power consumption that would have occurred if all of the selected systems had reached their peak consumption simultaneously. The actual collection peak could be significantly less, if the individual servers did not reach their peak simultaneously
- **Theoretical Collection Peak Amps (at 220 V).** Displays the Theoretical Collection Peak in amps for the selected systems. This field can be used to compare the theoretical maximum power consumption of the selected systems to a particular circuit size. The volts value (220 V, in this example) in this calculation comes from the **Options→Insight Power Manager Options, Power Line Voltage** setting. The actual collection peak could be significantly less, if the individual servers did not hit their peaks simultaneously

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.



NOTE: Cost savings are not displayed for HP Integrity servers.

Group power consumption breakdown

The Group Power Consumption Breakdown graph displays as individual line items the amount of power that has been consumed over the selected time scale by the selected systems. The graph displays both the **Average Power Consumption** and the **Peak Power Consumption**.

The Average Power Consumption data points show a breakdown of the average power consumed by the group of systems over the time period represented by a single point on the graph. For the 24 hour graph, each point on the graph represents 5 minutes of power consumption data. The line formed by the **Average Power Consumption** data shows the steady-state power consumption of the group of systems.

The Peak Power Consumption data points show the breakdown of the highest power consumption by the group of systems over the time period represented by a single point on the graph. The line formed by the **Peak Power Consumption** data shows the short-term spikes in power consumption by the group of systems.



NOTE: The graph can get quite crowded with many servers selected. This graph is best used for comparing a small number of systems.

To view the Group Power Consumption Breakdown information:

1. Select multiple systems from a collection.
2. Click **Reports**→**Insight Power Manager**. The **Insight Power Manager** page appears.
3. Select **Group Power Consumption Breakdown** from the graph type dropdown list. The **Group Power Consumption Breakdown** information appears.



NOTE: The Group Power Consumption Breakdown graph displays legend labels for each graph line.

The following analysis information is displayed for the time frame specified for each system:

- **Group Average Power Consumption Breakdown.** Displays the average power consumption for each of the selected systems during the current time scale.
- **Group Average Power Consumption.** Displays the summation of average power consumption for the group of selected systems during the current time scale.
- **Group Peak Power Consumption.** Displays the highest point of the summation of peak power consumption for the selected systems during the current time scale.
- **Group Average Amps (at 220 V).** Displays the summation of average amps consumed for the selected systems for the current time scale. Use this field to compare the power consumption of the selected systems to a particular circuit size. The volts value (220 V, in this example) in this calculation comes from the **Options**→**Insight Power Manager Options, Power Line Voltage** setting.
- **Group Kilowatt-hours.** Displays the energy consumed by the group of selected systems during the time scale in kilowatt-hours.
- **Group Annual Kilowatt-hours Estimate.** Displays a projection of the what the annual energy consumption would be if the selected system continued to consume energy at this average rate for a full year.
- **Group Estimated Cost (at USD 0.0874 per kWh).** Displays the estimated cost of powering the group of selected systems for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options** settings.
- **Group Annual Estimated Cost.** Displays a projection of what the annual cost to power the selected systems would be if the selected system continued to consume energy at this average rate for a full year.
- **Group Cooling Kilowatt-hours.** Displays an estimate of the power required to cool the group of selected systems during the time scale of the graph in kilowatt-hours. The Cooling Kilowatt-hours value is calculated by taking the Kilowatt-hours required to power the server and multiplying by the Cooling Multiplier from the **Options**→**Insight Power Manager Options, Cooling Multiplier** setting.
- **Group Estimated Cooling Cost (at USD 0.0874 per kWh).** Displays the estimated cost of the power required to cool the group of selected systems for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options** settings.
- **Group Annual Cooling Kilowatt-hours.** Displays an estimate of the power required to cool the group of selected systems for a full year in kilowatt-hours.
- **Group Annual Estimated Cooling Cost.** Displays a projection of what the annual cooling cost would be if the selected systems continued to consume energy at this average rate for a full year.
- **Estimate of Kilowatt-hours Saved.** Displays an estimate of the energy saved (both server power and cooling power) by HP Power Regulator technology for the group of selected systems for the time scale of the graph. See “Understanding HP Power Regulator savings” for more information.
- **Estimate of Cost Savings (at USD 0.0874 per kWh).** Displays an estimate of the energy cost saved, for server power and cooling power, by HP Power Regulator technology for the selected system for the time scale of the graph. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options**→**Insight Power Manager Options** settings.
- **Annual Kilowatt-hours Saved Estimate.** Displays a projection of the what the annual energy consumption would be if the selected system continued to consume energy at this average rate for a full year. See “Understanding HP Power Regulator savings” for more information.

- **Annual Cost Savings Estimate (at USD 0.0874 per kWh).** Displays a projection of what the annual cost saving would be (server power and cooling power) from HP Power Regulator technology, if the selected system continued to save energy at this average rate for a full year. The Currency Type designator (USD, in this example) and the Cost of Power per kWh (0.0874, in this example) used in this calculation come from the **Options→Insight Power Manager Options** settings.
- **Server with Highest Average Consumption.** Displays the name of the server in the group of selected systems with the highest average consumption.
- **Server with Highest Peak Consumption.** Displays the name of the server in the group of selected systems with the highest peak consumption.
- **Theoretical Collection Peak.** Displays the summation of the Peak Consumption values for all of the selected systems. The Theoretical Collection Peak represents the maximum power consumption that would have occurred if all of the selected systems had hit their peak consumption simultaneously. The actual collection peak could be significantly less, if the individual servers did not hit their peaks simultaneously
- **Theoretical Collection Peak Amps (at 220 V).** Displays the Theoretical Collection Peak in amps for the selected systems. This field can be used to compare the theoretical maximum power consumption of the selected systems to a particular circuit size. The volts value (220 V, in this example) in this calculation comes from the **Options→Insight Power Manager Options, Power Line Voltage** setting. The actual collection peak could be significantly less, if the individual servers did not hit their peaks simultaneously
- **Group Low Power Cap Value Breakdown.** Displays the Minimum power cap value for each of the selected systems during the current time scale.
- **Group Peak Power Cap Value Breakdown.** Displays the Maximum Power Cap value for each of the selected systems during the current time scale.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.



NOTE: Cost savings are not displayed for HP Integrity servers.

Group inlet air temperature

The Group Inlet Air Temperature option displays the average inlet air temperature for the selected systems.

To view the Group Inlet Air Temperature information:

1. Select multiple systems from a collection.
2. Click **Reports→Insight Power Manager**. The **Insight Power Manager** page appears.
3. Select **Group Inlet Air Temperature** from the graph type dropdown list. The **Group Inlet Air Temperature** information appears.



NOTE: The Group Inlet Air Temperature option displays legend labels for each graph line.

The following analysis information is displayed for the time frame specified for each system:

- **Group Average Inlet Air Temperature.** Displays the average inlet air temperature for the selected group of systems.
- **Standard Deviation.** Displays the standard deviation of the air inlet temperatures for the selected group of systems. The Standard Deviation is the square root of the variance from the average value. A small Standard Deviation indicates that all inlet temperatures are clustered closely around the average. The data used to calculate the standard deviation consists of all temperature samples within the selected time range for all selected servers. The Standard Deviation is not calculated from individual server averages.
- **Number of Servers Inside One Standard Deviation.** Displays the number of systems whose inlet air temperature is within one standard deviation of the average air inlet temperature. These are the systems that are clustered closely around the average air inlet temperature.

- **Number of Servers Outside One Standard Deviation.** Displays the number of systems whose inlet air temperature is not within one standard deviation of the average air inlet temperature. These are the outlying systems that are not clustered closely around the average air inlet temperature.
- **Temperature Trend.** Displays whether the average air inlet temperature for the selected group of systems is increasing or decreasing.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.

Group inlet air temperature breakdown

The Group Inlet Air Temperature Breakdown displays the inlet air temperature historical data for the selected systems.

To view the Group Inlet Air Temperature Breakdown information:

1. Select multiple systems from a collection.
2. Click **Reports**→**Insight Power Manager**. The **Insight Power Manager** page appears.
3. Select **Group Inlet Air Temperature Breakdown** from the graph type dropdown list. The **Group Inlet Air Temperature Breakdown** information appears.



NOTE: The Group Inlet Air Temperature Breakdown option displays legend labels for each series.

The following analysis information is displayed for the time frame specified for each system:

- **Group Inlet Air Temperature Breakdown.** Displays the average inlet air temperature for each of the selected systems during the current time scale.
- **Group Average Inlet Air Temperature.** Displays the average inlet air temperature for the selected group of systems.
- **Standard Deviation.** Displays the standard deviation of the air inlet temperatures for the selected group of systems. The Standard Deviation is the square root of the variance from the average value. A small Standard Deviation indicates that all inlet temperatures are clustered closely around the average.
- **Number of Servers Inside One Standard Deviation.** Displays the number of systems whose inlet air temperature is within one standard deviation of the average air inlet temperature. These are the systems that are clustered closely around the average air inlet temperature.
- **Number of Servers Outside One Standard Deviation.** Displays the number of systems whose inlet air temperature is not within one standard deviation of the average air inlet temperature. These are the outlying systems that are not clustered closely around the average air inlet temperature.
- **Temperature Trend.** Displays whether the average air inlet temperature for the selected group of systems is increasing or decreasing.

The following data collection information is displayed:

- **Data Collection Status.** Displays whether the data collection task was successful.
- **Latest Data Collection Date.** Displays the date and time that the data was last collected.

Related topics

- [Overview](#)
- [Understanding HP Power Regulator for ProLiant](#)
- [Understanding HP Power Regulator for Integrity](#)
- [Understanding HP Power Regulator savings](#)

HP Power Regulator Actions

The HP Power Regulator Actions section enables you to set and change the *Power Cap* and/or change the Power Regulator mode of the systems selected. The Power Regulator modes include Dynamic, Static Low

Power and Static High Performance. The Power Cap can be entered in watts, Btu-hr or a percentage value between the minimum and maximum measured power consumption of the systems.

The following Power Regulator Actions appear in a table:

- **System Name.** The name or IP address of the managed systems.
- **HP Power Regulator Status** This column displays the current IPM status.
IPM status includes:
 - **HP Dynamic Power Savings Mode.** Allows the system to dynamically change the processor power level when needed, based on current operating conditions.
 - **HP Static Low Power Mode.** Sets the processor to the lowest supported processor state and forces it to stay in that state.
 - **HP Static High Performance Mode.** Sets the processor to the highest supported processor state and forces it to stay in that state.
 - **OS Control Mode.** Sets the processor to the highest supported processor state. This is the required setting for operating system power management.
 - **Unknown.** Occurs when there is not enough recent data collection or when HP SIM has been recently restarted.
 - **Power Cap.** This column displays the power cap for the server. This can have a value of **Not Supported**, **Not Set**, the current power cap value, or an editable field with a checkbox to enable or disable the power cap if the feature is supported.
- **Measured Minimum Power.** This column reflects the measured idle power for the system.
- **Measured Maximum Power.** This column reflects the measured maximum power for the system.

The following HP Power Regulator Actions are available:



NOTE: The buttons on the right side of the systems status table affect only systems that are selected. To use the buttons, you must select one or more systems in the table and click the applicable button.

- ▲ **Change** This option changes the HP Power Regulator mode and the Power Cap setting.



NOTE: The **Change** option is now also available on blades.

Related topics

- [Overview](#)
- [Understanding HP Power Regulator for ProLiant](#)
- [Understanding HP Power Regulator for Integrity](#)
- [Understanding HP Power Regulator savings](#)

6 Configure HP Power Regulator Actions

How to configure HP Power Regulator

The HP Power Regulator Configure section enables you to set the Power Cap and/or change the Power Regulator mode of the systems selected.

To configure the HP Power Regulator mode or the Power Cap:

1. From the **HP Insight Power Manager** page, open the **HP Power Regulator Actions** section, select the systems to change and click **Change**. The **Configure HP Insight Power Manager** section appears.
2. Select one of the following modes from the Insight Power Manager Status dropdown list:
 - **HP Dynamic Power Savings Mode.** Allows the system to dynamically change the processor power level when needed based on current operating conditions.
 - **HP Static Low Power Mode.** Sets the processor to the lowest supported processor state and forces it to stay in that state.
 - **HP Static High Performance Mode.** Sets the processor to the highest supported processor state and forces it to stay in that state.
 - **OS Control Mode.** Configures the system to support OS-based power management. Additional steps might have to be performed to the operating system to finish enabling OS-based power management. The system will operate at the highest supported processor state until the OS-based power management is enabled.
3. Enter a **Power Cap** value in the text box.
 - The **Power Cap** value can be entered in Watts, Btu-hr, or a percentage of the difference between the Measured Minimum and Measured Maximum Power.
 - **Measured Minimum Power.** This column reflects the measured idle power for the system in its current configuration.
 - **Measured Maximum Power.** This column reflects the measured maximum power observed for the system in its current configuration.
 - The value entered should be between the Measured Minimum and Measured Maximum Power.
 - The closer the entered value is to the Measured Minimum Power the more likely that your system(s) performance will be impacted.



NOTE: Remove the check mark in the Power Cap column if you want to disable the currently configured power cap.

4. Click **Next** to continue the process of changing the **HP Power Regulator** state and the **Power Cap** setting. You can click **Cancel** to discard your selection.
5. A summary of the changes to be made are shown. If you are configuring a **Power Cap**, the impact of that change is analyzed and reported as one of three results.
 - **OK:** This value should not significantly impact system performance.
 - **Caution:** This value may impact system performance.
 - **Warning:** This value will negatively impact system performance. Consider revising.
6. Click the **Confirm Change** to continue and make the change. The progress and results of the change will be displayed in the **Status** field. You may also click the **Cancel** or **Previous** buttons if you do not want to make the change.



NOTE: See “Understanding HP Power Regulator for ProLiant” for more information on processor power states and when each state is useful.

After making changes to **HP Insight Power Manager**, a summary will be seen similar to the image below:

Configure HP Insight Power Manager:

System Name	Current Power Regulator Setting	New Power Regulator Setting	Current Cap	New Cap	Impact	Status
diablo14	HP Dynamic Power Savings Mode	HP Dynamic Power Savings Mode	285 Watts	315 Watts	OK	
diablo15	HP Static Low Power Mode	HP Dynamic Power Savings Mode	255 Watts	224 Watts	OK	
diablo2	HP Static High Performance Mode	HP Dynamic Power Savings Mode	Not Supported	Not Supported		

The table shows the potential changes to the user to allow them to tweak and experiment prior to making actual changes to nodes on the network. The table lists both the current mode and **Power Cap** value set by the user.

Configure as a single group.				
HP Power Regulator Status	Measured Minimum Power	Measured Maximum Power	Power Cap	
HP Dynamic Power Savings Mode	245 Watts	555 Watts	<input checked="" type="checkbox"/>	540 Watts

Configure each system individually.				
System Name	HP Power Regulator Status	Measured Minimum Power	Measured Maximum Power	Power Cap
diablo14	HP Dynamic Power Savings Mode	245 Watts	324 Watts	<input checked="" type="checkbox"/> 285 Watts
diablo15	HP Static Low Power Mode	0 Watts	231 Watts	<input checked="" type="checkbox"/> 255 Watts
diablo2	HP Static High Performance Mode	Not Supported	Not Supported	Not Supported

When viewing the group portion of the table as seen in the image above, the **Power Cap** value (if supported) is allocated to the supported systems.



NOTE: The cap is determined for each system by converting numerical values (nonpercentage) to a percentage and then calculating the actual numerical cap based on that information. For example, the user selects three systems and those systems reported a total maximum measured power of 1000 watts and an average power utilization of 700 watts. This number is converted to a percentage of measured maximum power which is 80% and that value is used to set the cap on the individual nodes.

- **Export** This option saves the power history table in CSV format.
To export a file in CSV format:
 1. From the **HP Insight Power Manager page open the Power Regulator Actions** section, select one or more systems for which you want to export information and click **Export**. A dialog box displays asking you to confirm your intention to save a CSV file.
 2. Click **Save**, and enter a path where the file is to be saved.

The following information is included in the CSV file:



NOTE: The systems and time ranges included are defined by the graph currently displayed in the user interface.

The CSV file contains the following columns:

Column Name	Description
Name	DNS name
Model	Product name of the system
Time	Time this power sample was collected
Ambient Temperature (C)	Inlet air temperature in Celsius
Average Power (Watts)	Average power in Watts
Peak Power (Watts)	Peak power in Watts
Power Regulator Mode	Efficiency mode: OS Control, Static Low, Static High, Dynamic, Unknown
Average CPU Utilization	0-100% - Should always be below average CPU capacity limit
Average CPU Capacity Limit	0-100%

Column Name	Description
Percent CPU MaxPower	The amount of time (%) the CPU spent in the maximum power state.
Power Cap	Effective power cap at the time the sample was taken
Cap Unachievable?	True or false. Was the cap achievable?
Cap Punitive?	True or false. Was the cap punitive to performance?
CPU Cap throttle	Performance penalty that a power cap causes, expressed as a percentage.



NOTE: A CSV file is a comma separated text file. It is intended to be opened in a spreadsheet program such as Microsoft Excel. After the data is opened in a spreadsheet, additional analysis is possible beyond what IPM provides.

NOTE: The data in the CSV export file is raw data from the iLO 2 management processor, unmodified by any analysis in IPM. It is not guaranteed to be sorted in any way.

- The **Save As** option enables you to save the selected systems as a collection. Use this feature if you have a set of systems with power management data that you access frequently. After a collection is created, you can select the collection directly from the **System and Event Collections** tree view from the left side of the HP SIM home page and then launch the IPM for the systems in the collection.
To save your selection as a collection:
 1. From the **HP Insight Power Manager** page open the **HP Power Regulator Actions** section, select the system to be included in the collection and click **Save As**. The **Save Collection As** section appears.
 2. In the **Name** field, enter a name for the new collection.
 3. In the **Place in** field, select where you want to save the collection from the dropdown list.
 4. Click **OK** to save the collection. A message appears indicating whether the collection was saved successfully. You can click **Cancel** to cancel the operation.

Related topics

- [Overview](#)
- [Understanding HP Power Regulator for ProLiant](#)
- [Understanding HP Power Regulator for Integrity](#)
- [Understanding HP Power Regulator savings](#)

7 System tab for servers

Related topics

- ▲ [Configuring IPM with Insight Power Manager Options](#)

8 Troubleshooting

Troubleshooting

My IPM supported server is being listed as System is not supported by Insight Power Manager.

Solution: Take the following steps to resolve the problem:

1. Verify that your server is indeed supported by the version of IPM you have installed, and that you are running the required iLO firmware versions on the managed systems. To access the latest IPM support matrix, see the instructions in the “Getting started” section of this document. To view IPM version information, select **Help**→**About HP Insight Power Manager**.
2. Select **Options**→**Insight Power Manager Options** and make sure that the IPM plug-in is enabled.
3. Check to see that the management processor is discovered and associated with the server.



NOTE: **Server Management Processor** association is a must to be able to view the Power details in Insight Power Manager.

4. Run the **Identification Task** on both the server and its management processor by selecting **Options**→**Identify Systems**.

Running the **Identification Task** will help Insight Power Manager to recognize the server as a IPM supported system.

IPM has failed to fetch the Power details and a message is displayed indicating Unable to communicate with iLO because it does not have an iLO Advanced or iLO Select license .

Solution: Take the following steps to resolve the problem:

1. Launch the iLO web interface and assign the Advanced/Select license if the iLO is not already licensed.
2. Check to be sure the iLO is associated with its server.
3. Launch the **Deploy**→**License Manager** by selecting the iLO as target and click on **Collect license info...**
4. Select **Deploy**→**License Manager** to verify the iLO is listed as the licensed system under the **HP iLO Advance Pack** or the **HP iLO Select Pack** category.



NOTE: iLO must appear as a licensed system in the License Manager to view the Power details from Insight Power Manager.

5. Launch the IPM page on that server and click **Refresh Data** to view the latest power details.

IPM fails to show the Power graph and I receive the message Insight Power Manager could not communicate with the Management Processor .

Solution: Take the following steps to resolve the problem:

1. Make sure the server's **Management Processor** is discovered in **Systems Insight Manager**.



NOTE: Server to iLO association is a must to view the Power graph in Insight Power Manager.

2. Select **Options**→**Identify Systems** to run the **Identification Task** on the management processor and its server to get the association.
3. Click **Refresh Data** to view the latest power information.

Glossary

Central Management Server (CMS)	A system in the management domain that executes the HP SIM software. All central operations within HP SIM are initiated from this system.
Desktop Management Interface (DMI)	An industry-standard protocol, primarily used in client management, established by the Desktop Management Task Force (DMTF). DMI provides an efficient means of reporting client system problems. DMI-compliant computers can send status information to a central management system over a network.
enclosure	A physical container for a set of server blades. It consists of a backplane that routes power and communication signals, and additional hardware for cabling and thermal issues. It also hosts the CPU or server power supplies.
health status	Health status is an aggregate status all of the status sources (which can be SNMP, WBEM, DMI, and HTTP) with the most critical status being displayed. <i>See also</i> system health status.
HP Insight Power Manager (IPM)	An integrated power monitoring and management application that provides centralized control of server power consumption and thermal output at the datacenter level. It extends the capacity of datacenters by enabling the user to control the amount of power and cooling required for ProLiant servers. Built on ProLiant Power Regulator Technology, it extends new server energy instrumentation levers into HP SIM for greater Unified Infrastructure Management.
HP Systems Insight Manager (HP SIM)	System management software that is capable of managing a wide variety of systems, including HP systems, clusters, desktops, workstations, and portables. HP SIM; combines the strengths of Insight Manager 7, HP Tootools, and HP Servicecontrol Manager to deliver a single tool for managing HP ProLiant, Integrity, and HP 9000 systems running Windows, Linux, and HP-UX. The core HP SIM software delivers the essential capabilities required to manage all HP server platforms. HP SIM can also be extended to deliver unparalleled breadth of system management with plug-ins for HP storage, power, client, and printer products. Plug-ins for rapid deployment, performance management, and workload management enable systems administrators to pick the value added software required to deliver complete lifecycle management of their hardware assets.
HP Systems Insight Manager database (database)	The database that stores vital information about HP SIM, including users, systems, and toolboxes.
Integrated Lights-Out (iLO)	Basic system management functions, diagnostics, and essential Lights-Out functionality are included as core components of Integrated Lights-Out (iLO) supported servers. The standard features of iLO are referred to as iLO Standard. Advanced remote administration functionality, referred to as iLO Advanced, can be licensed with the optional Integrated Lights-Out Advanced Pack for HP Integrity Servers.
license keys	The contractual permissions granted by HP to the customer in the form of a coded embodiment of a license that represents a specific instance of a license. A single license can be represented by a single key or by a collection of keys.
Onboard Administrator	The Onboard Administrator is the central point for controlling an entire c-Class rack. It offers configuration, power, and administrative control over the rack, and its associated blades (Compute Servers), blade management processors (iLOs), network switches (depending on the models of switches used) and storage components (such as SAN or SATA). The Onboard Administrator is a single management processor, with shared resources to an optional backup twin processor for failover.
Power Cap	Power Cap allows the user to set the wattage limit on the amount of power a server will consume.
Simple Network Management Protocol (SNMP) system	One of the management protocols supported by HP SIM. Traditional management protocol used extensively by networking systems and most servers. MIB-2 is the standard information available consistently across all vendors. Systems on the network that communicate through TCP/IP. To manage a system, some type of management protocol (for example, SNMP, DMI, or WBEM) must be present on the system.

system health status

Examples of systems include servers, workstations, desktops, portables, routers, switches, hubs, and gateways.

This is the aggregate status all of the status sources (for example, SNMP, WBEM, DMI, and HTTP) that are supported on a target system, with the most critical status being displayed. The following are the different system health statuses that can be displayed:

- **Critical** HP SIM can no longer communicate with the system. The system was previously discovered but cannot be pinged. The system might be down, powered off, or no longer accessible on the network because of network problems.
- **Major** A major problem exists with this system and needs to be addressed immediately. For systems running an HP Insight Management Agent, a some component has failed. The system might no longer be properly functioning, and data loss might occur.
- **Minor** A minor problem exists with this system. For systems running Insight Management Agent, a component has failed but the system is still functioning.
- **Warning** The system has a potential problem or is in a state that might become a problem.
- **Normal** The system is functioning correctly.
- **Disabled** The system is disabled from monitoring but is not necessarily turned off.
- **Unknown** HP SIM cannot obtain management information about the system.
- **Informational** The system might be in a transitional or nonerror state.

Web-Based Enterprise Management (WBEM)

An Industry initiative to provide management of systems, networks, users, and applications across multiple vendor environments. WBEM simplifies system management, providing better access to both software and hardware data that is readable by WBEM compliant applications.

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