



IBM Systems

IBM Power Executive  
Installation and User's Guide

*Version 1.0*







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**Note**

Before using this information and the product it supports, read the information in the "Notices" Appendix.

**First Edition (December 2005)**

This edition applies to version 1.0 of IBM Power Executive and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this user's guide

This user's guide provides instructions for using IBM® Power Executive to manage the power and thermal needs of BladeCenter™ systems in the data center. Power Executive is part of a larger power-management implementation that includes hardware and firmware components. Power Executive 1.0 is an extension to IBM Director 5.1.

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## Who should read this user's guide

This user's guide is for system administrators and operators using Power Executive from IBM Director Console to manage the power and thermal needs of BladeCenter systems in the datacenter.

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## Conventions and terminology

These notices are designed to highlight key information:

**Note:** These notices provide important tips, guidance, or advice.

**Important:** These notices provide information or advice that might help you avoid inconvenient or difficult situations.

**Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice appears before the instruction or situation in which damage can occur.

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## Related information

This topic provides links to additional information related to Power Executive.

### Power Executive resources on the World Wide Web

The following Web pages provide resources for understanding, using, and troubleshooting Power Executive and other systems-management tools.

#### Power Executive Web site

[www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/extensions/powerexec.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions/powerexec.html)

Obtain an overview of Power Executive and links to download the product, release notes, and user's guide.

#### IBM personal computing support page

[www.ibm.com/pc/support/](http://www.ibm.com/pc/support/)

Locate support for IBM hardware and systems-management software.

#### IBM Systems Management Software: Download/Electronic Support page

[www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/)

Download IBM systems-management software, including Power Executive. Check this Web page regularly for new Power Executive releases and updates.

**IBM eServer® xSeries® Systems Management page**

[www.ibm.com/servers/eserver/xseries/systems\\_management](http://www.ibm.com/servers/eserver/xseries/systems_management)

Obtain an overview of IBM systems management.

**IBM ServerProven® page**

[www.ibm.com/pc/us/compat/index.html](http://www.ibm.com/pc/us/compat/index.html)

Obtain information about IBM xSeries, IBM eServer®, IBM BladeCenter, and IBM IntelliStation® hardware compatibility.

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## How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information. If you have any comments about this book or any other IBM publication, use the form for reader's comments that is provided at the back of this publication. If the form has been removed, address your comments to:

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U.S.A.

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## Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

### Features

Power Executive meets the accessibility standards for Section 508 of the US Rehabilitation Act.

These are the major accessibility features in Power Executive:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen.
- You can operate all features using the keyboard instead of the mouse.
- You can choose from a variety of high-contrast color schemes and large font sizes in the IBM Director Console.

Power Executive supports all accessibility features provided by IBM Director.

### Keyboard navigation

This product uses standard Microsoft® Windows® and Java™ navigation keys.

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## Chapter 1. Getting started

This topic contains general and conceptual information about Power Executive.

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### Introducing Power Executive

This topic provides an overview of Power Executive.

Power Executive is an IBM Director extension that provides the Power Executive task in an IBM Director environment. The Power Executive task displays the Power Executive window in IBM Director Console. The Power Executive window enables you to monitor and collect power consumption data from chassis objects, manage trend data, and export data from Power Executive.

Power Executive is comprised of three components: Power Executive Server, Power Executive Console, and the Power Executive database.


Additionally, the information in Power Executive is affected by some events. For more information, see “Understanding events that affect Power Executive” on page 26.

### Power Executive Task Overview

Use Power Executive to monitor and collect power consumption data from supported BladeCenter chassis objects and power objects, manage trend data, and export data from Power Executive.

Power Executive is comprised of three components: Power Executive Server, Power Executive Console, and Power Executive database.

For more information about the Power Executive task, see the *IBM Power Executive Installation and User's Guide*. This document is available from the Power Executive Web page. See the following table for availability.

Icon	
Supported IBM Director objects	Level-0 managed systems
Supported operating systems	<ul style="list-style-type: none"><li>• Linux<sup>®</sup></li><li>• Windows</li></ul> For detailed operating-system support information, see the Power Executive documentation.
Availability	Extension to the IBM Director product. You can download the extension from the IBM Support Web site at <a href="http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director">http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director</a> .
Required hardware or hardware limitations	For installation, none. For monitoring, this task only supports specific BladeCenter chassis. For details, see the Power Executive documentation.
Required software	BladeCenter Management extension to IBM Director 5.1 must be installed.

Required protocols	None
Required device drivers	None
Mass Configuration support	No
Scheduler support	No
Files associated with this task	None
Events associated with this task	None, but the information displayed by Power Executive is affected by some events. For more information, see the Power Executive documentation.

## Power Executive terminology

Power Executive uses terminology that is specific to power management in IBM Director Console.

The hardware in a Power Executive environment is referred to in the following ways:

- A *management server* is a server on which both IBM Director Server and Power Executive Server are installed.
- A *management console* is a system on which both IBM Director Console and Power Executive Console are installed.
- A *managed system* is a BladeCenter server that is a level-0 system (agentless) in an IBM Director environment.
- A *module* is a BladeCenter component that is inserted in a bay in a chassis.
- A *management module* is the BladeCenter component that handles system-management functions. It configures the chassis and switch modules, communicates with the blade servers and all I/O modules, multiplexes the keyboard/video/mouse (KVM), and monitors critical information about the chassis and blade servers.

The software and its components in a Power Executive environment are referred to in the following ways:

- A *chassis object* is an IBM Director managed object that represents a BladeCenter chassis whose power information can be displayed in Power Executive.
- A *power object* is an IBM Director managed object that represents a module in a BladeCenter chassis. Power objects can include the following BladeCenter components:
  - power modules
  - processor blades
  - I/O modules
  - management modules
  - blower modules
  - media trays
  - midplanes

---

## Power Executive components

This topic provides information about the Power Executive components.

Power Executive is comprised of the following three components:

- Power Executive Server
- Power Executive Console
- Power Executive database

### Power Executive Server

Power Executive Server maintains the Power Executive environment and manages all Power Executive operations.

Power Executive Server communicates out-of-band with each managed system and Power Executive Console to display status and perform operations. Power Executive Server communicates with IBM Director Server to provide event filtering and event actions that support IBM Director event action plans. Power Executive Server must be installed on the management server. When you install Power Executive Server, Power Executive Console is installed automatically.

Power Executive Server communicates indirectly with management modules by querying IBM Director Server for information that IBM Director has already collected from the management modules. When IBM Director does not have the requested information, Power Executive Server can communicate directly with management modules through an internal communication path.

Power data is collected only while the Power Executive Server is running. When you install Power Executive, the Power Executive Server starts running. It runs whenever the IBM Director Service is running. Power Executive collects data on BladeCenter chassis every minute, or as configured on the Manage Trend Data window.

### Power Executive Console

Power Executive Console provides the graphical user interface (GUI) to Power Executive in IBM Director Console.

Install Power Executive Console on all management consoles from which a system administrator remotely accesses the management server and performs Power Executive tasks.

### Power Executive database

The Power Executive database stores information collected by Power Executive Server.

Power Executive creates or updates its database when Power Executive obtains information that IBM Director cannot provide. The Power Executive database can contain information about chassis objects, power objects, and historical data, such as temperature and power data over time.

The Power Executive database is created in the PowerExecutive subdirectory of the IBM Director installation directory.

When you uninstall IBM Director Server, it does not remove the Power Executive database unless you request that customizations should be deleted during the uninstallation of IBM Director Server.

The size of the Power Executive database directly correlates to the short-term polling interval, the long-term polling interval, and the number of days that short-term and long-term trend data is kept. All of these values are configurable. You can control them and the size of the Power Executive database by using the Manage Trend Data window. For information about doing so, see “Managing collection of trend data” on page 24.

Further, the Power Executive database can grow very large when you are retaining data about blade servers that have enabled the power meter.

As an example, you could have one chassis fully populated with 14 blade servers, each that have enabled the power meter. Assuming that the short-term polling cycle is the default value of 1 minute and the long-term polling cycle is the default value of 10 minutes, then a day’s worth of short-term data consumes approximately 1 1/4 MB of database storage. In this scenario, one day’s worth of long-term polling data consumes approximately 126 KB of database storage.

When the Power Executive database cannot expand, Power Executive deletes the oldest historical data from the database to free up room for the new data that it is collecting.

---

## Power Executive task

The Power Executive task runs the Power Executive graphical-user interface from an IBM Director Console. You can use the Power Executive task to view and monitor power consumption on various chassis objects and power objects in the IBM Director environment.

When you add Power Executive Console to your IBM Director environment, the Power Executive task is added to IBM Director Console. The Power Executive task does not have any subtasks. The Power Executive task can be started in various ways: from the Console menu, from the Tasks menu, from the toolbar, by dragging the Power Executive task from the Tasks pane onto a managed system or a managed group, or by dragging a managed system or managed group onto the Power Executive task in the Tasks pane. The Power Executive task can be started for all chassis objects that are known to IBM Director Server, or it can be started for only specific chassis objects.

From the Power Executive interface, you can perform the following tasks for chassis objects and power objects:

- Monitor power consumption data
- Collect power consumption data
- Manage trend data
- Export data

More information about these tasks is provided in Chapter 3, “Using Power Executive,” on page 15.

## Starting Power Executive for all chassis objects

When you start Power Executive for all chassis objects in the IBM Director group called All Systems, the Power Executive window opens and displays a tree of all chassis objects on IBM Director Server.

When there are numerous chassis objects on the management server, this method can take several minutes for Power Executive to start. However, the advantage of starting Power Executive in this manner is that all chassis objects can be managed from one window.

## Starting Power Executive for some chassis objects

When you start Power Executive for only a chassis object or a group of chassis, the Power Executive window opens and displays a tree of only the selected objects.

The left pane in Power Executive contains only the selected chassis objects, only those chassis that contain the blade servers that have also been selected, and only the chassis objects in a selected group. When you select a blade server, Power Executive determines the containing chassis object and displays the entire tree structure for that chassis object, not just the blade server that you selected.

The advantage of starting Power Executive in this manner is that Power Executive must obtain information about only a subset of chassis objects instead of obtaining information about all chassis objects on IBM Director Server. Power Executive starts quickly when you use this method. The disadvantage is that you can manage only those chassis objects that were selected when you started Power Executive. If you need to manage power objects in other chassis objects or at a later time, you must start another Power Executive task for those additional chassis objects.

---

## Power Executive window

After you start the Power Executive task, the Power Executive window opens and provides a graphical user interface for managing selected chassis objects and power objects on the management server.

The Power Executive window contains a menu bar, a tool bar, and a graphical representation of the chassis object selected and power consumption data on various power objects in these chassis objects. The Power Executive window displays only those power objects in the chassis objects for which it was started, which might not be all power objects on the management server.

The Power Executive window contains these major areas:

- Navigation pane
- Detail pane
- Trend pane

You can customize which of these panes are displayed in the Power Executive window. To do so, see “Customizing the Power Executive window” on page 8.

Regardless of the panes that are displayed in the Power Executive window, you can use the breadcrumb at the upper right of the window to determine the tree structure of the object that is currently selected. You can also navigate back up the tree structure to see information about higher-level objects. This is equivalent to

collapsing the tree structure in the navigation pane or selecting a higher-level tree element. To expand the tree structure, you must use the navigation pane.

You can force the window to refresh in different ways, as explained in “Refreshing the Power Executive window” on page 9.

## Navigation pane

Use the navigation pane to select the power object for which the Power Executive window displays information.

The left side of the window contains the navigation pane, which contains a tree structure that can be expanded and collapsed. The contents of the tree structure vary based on the method used to start Power Executive:

- If Power Executive is started by double-clicking the Power Executive task, then the navigation pane displays all chassis objects that are known to IBM Director. The root of the tree structure is the IBM Director group All Systems.
- If Power Executive is started by targeting a group of chassis, then the navigation pane displays all chassis objects in that group. The root of the tree structure is the group that you targeted.
- If Power Executive is started by targeting a single blade server or chassis, then the navigation pane displays only the selected chassis object or chassis object that contains the targeted blade server. The root of the tree structure is the chassis object itself.

When you expand an individual chassis object within the navigation pane, the tree structure shows folders that identify the power domains in the chassis. Under each power domain folder are various power objects within that power domain, such as the following objects:

- power modules
- blade servers
- I/O modules
- management modules
- blower modules
- media trays
- midplanes

**Note:** The Power Executive window uses the term module to refer to a BladeCenter component that is inserted in a bay. Generally an entire BladeCenter component is inserted into one bay so this distinction is unnecessary. However, some blade servers span multiple bays and those bays can be in different power domains. In this scenario, it is important to remember that Power Executive is displaying power information per each bay and not per each BladeCenter component.

When you select one of these power objects, Power Executive updates the object information pane and the trend pane to display information about the power object that you selected.

## Detail pane

Use the detail pane to view information about a selected power object.

The upper right side of the window contains the detail pane, which use a table to display information about the chassis object or power object that is currently selected in the tree structure.



The rows and columns in the table change with the chassis object or power object that is selected.

- If you select the root of the tree in the navigation pane and it represents an IBM Director group, the detail pane displays rows about the chassis objects in that group and columns with information about that chassis object.
- If you select a chassis in the navigation pane, the detail pane displays rows about the power domains in the chassis and columns with information about those power domains.
- If you select a power domain in the navigation pane, the detail pane displays rows about the power objects in that power domain and columns with information about those power objects.
- If you select a power object within a power domain in the navigation pane, the detail pane displays information about the fields and field values for that power object.

For information about the columns and fields in the tables of the details pane, see “Monitoring power consumption data” on page 15.

Power Executive updates the information in the detail pane when new information becomes available, which is generally once per polling interval. The default is every minute, but this polling interval can be customized. For more information, see “Managing collection of trend data” on page 24.

You can use Power Executive to export the information in the detail pane. For more information, see either “Exporting a trend table” on page 26 or “Exporting a trend graph” on page 26.

When the detail pane is displaying group, chassis, or power domain information, the last row of the table provides a summary of the other information in the table. Just the summary information in the detail pane can be exported by Power Executive. For more information, see “Exporting summary data” on page 25.

## Trend pane

Use the trend pane to view information about current and historical power consumption for a selected power object.

The lower right side of the window contains the trend pane, which provides a power meter and either a tabular or a graphical view of power data over time about the power object that is currently selected in the tree structure.

The watts shown in the power meter can represent alternating current (ac) or direct current (dc) watts as follows:

- When the power meter is displayed for a power object, the watts in the power meter represent dc watts.
- When the power meter is displayed for a group of chassis, an individual chassis, or a group, the watts in the power meter represent ac watts.

The title for the power meter changes to represent the type of watts being measured.

The time range for the displayed trend data is indicated by the trend data interval drop-down list box. You can select one of the predefined data ranges or create a custom trend data interval. For more information, see “Creating a custom time interval for the trend pane” on page 24.

The predefined data ranges are as follows:

- Last hour
- Last 12 hours
- Last 24 hours
- Last 48 hours
- Last week
- Last 2 weeks
- Last month
- Last 6 months
- Last year

The check boxes above the trend data table or trend data graph enable you to control the display of power in use, minimum and maximum power in use, and event information. The values for each of these graphs is displayed in the trend data graph in a different color. For the trend data table, this information is put into cells of the table.

*Table 1. Colors and meanings that are used in trend graph*

Graph Check boxes	Displayed in trend graph as	Description
Power in Use	Green line	Shows the power-in-use as reported by the BladeCenter management module.
Min and Max Power in Use	Minimum power is shown as a blue line while maximum power is shown as a red line	Shows the minimum power that the object has consumed and the maximum power that the object has consumed.
Events	Green triangles and yellow diamonds	Shows the Power Executive events that have occurred. Each event has a severity. For more information, see “Events reported on the trend pane” on page 28

If the Power in Use and Min and Max Power check boxes are selected for display and all three power values are the same, the combined line is red.

On the trend data graph, you can also select a time range graphically by using the mouse to zoom in or out on the current view.

## Customizing the Power Executive window

You can customize the contents of the Power Executive window.

You can control the display of these panes on the Power Executive window:

- Navigation pane
- Detail pane
- Trend pane

To show or hide one of these panes, use the View menu to check or uncheck the name of each pane.

When the trend pane is displayed, you can control its display as follows:

- Show or hide the power meter
- Show the trend data as a graph
- Show the trend data as a table

To control these aspects of the trend pane, use the View menu to check or uncheck each aspect you wish to control.

## Refreshing the Power Executive window

You can use the Refresh function to request an update of the information that is shown in the Power Executive window.

Power Executive obtains its information from persistent storage in IBM Director Server and then caches the information on the console for subsequent display in Power Executive. See “Monitoring power consumption data” on page 15 for the types of information that is displayed by Power Executive.

By default, the window view is refreshed automatically once per short-term polling interval. The default is every minute, but this polling interval can be customized. To configure the short-term polling interval, see “Managing collection of trend data” on page 24.

Additionally, certain events from Server Configuration Manager also cause refreshes. For more information, see “Events that cause refresh operations” on page 27.

The Configuration Manager Editor allows you to create and edit profiles that include configuration settings for the components of BladeCenter<sup>®</sup> Chassis, such as switches and management modules.

However, with the Refresh function, you can force a refresh request rather than waiting for the polling interval or an event to occur.

To refresh the Power Executive window, click the Refresh icon in the toolbar. If the management server contains several power objects that are being displayed in Power Executive, the refresh operation can take several minutes. Alternatively, you can use the **View → Refresh** menu option.

During the refresh operation, the status line of the Power Executive window displays the word Refreshing to indicate that the operation is active. After the refresh operation is complete, the status line displays the word Ready.

---

## Invoking Power Executive functions

Operations are invoked in Power Executive primarily through the toolbar or the menu bar at the top of the Power Executive window.

You can use the menu bar to suspend and resume data collection, manage trend data, export power information, derate power for individual power objects, customize the contents of the Power Executive window, access the Power Executive help system, and close the Power Executive window. Menu bar operations are explained in Chapter 3, “Using Power Executive,” on page 15.

The Power Executive toolbar contains the functions that are described in Table 2:

*Table 2. Toolbar icons and their actions*








Icon	Action
	Hides the Power Meter in the trend pane. This icon is available only when the Power Meter is displayed in the trend pane.

Table 2. Toolbar icons and their actions (continued)

Icon	Action
	Displays the Power Meter in the trend pane. This icon is available only when the Power Meter is not displayed in the trend pane.
	Displays trend data in graphical format. This toolbar icon is available only when the trend data is displayed in tabular format.
	Displays trend data in tabular format. This toolbar icon is available only when the trend data is displayed in graphical format.
	Refreshes the entire tree structure in the navigation pane and updates the power information in the detail and trend panes.
	Suspend data collections. This toolbar icon is available only for chassis objects whose data is actively being collected by Power Executive.
	Resume data collections. This toolbar icon is available only for chassis objects whose data collection has been suspended by Power Executive.

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## Chapter 2. Installing Power Executive

This chapter provides information about requirements, planning, and preparation, as well as instructions for installing and uninstalling Power Executive.

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### Requirements

This topic provides information about Power Executive product requirements.

In addition to the requirements that are applicable to IBM Director 5.1, Power Executive has further restrictions regarding the hardware and software with which it can be used. For information about IBM Director 5.1 requirements, see the *IBM Director Installation and Configuration Guide*.

#### Hardware requirements

This section describes the minimum hardware requirements that must be met when you install or use Power Executive

##### Management servers and management consoles

Power Executive can be installed on any management server or management console that supports IBM Director 5.1.

##### Managed systems

Power Executive can monitor the power objects in certain BladeCenter servers that are IBM Director level-0 managed systems:

Specifically, Power Executive can monitor these BladeCenter chassis:

- BladeCenter machine type 8677
- BladeCenter T, machine types 8720 and 8730

Within a supported BladeCenter chassis, Power Executive can provide actual power consumption information for the BladeCenter HS20, machine type 8843, because that blade server can enable the power meter function.

Within a supported BladeCenter chassis, Power Executive can provide estimates of power consumption for these blade servers that do not have power-metering support:

- BladeCenter HS20, machine type 8678
- BladeCenter HS20, machine type 8832
- BladeCenter JS20, machine type 8842
- BladeCenter LS20, machine type 8850

#### Supported operating systems

Power Executive is supported for use with IBM Director 5.1 management servers and management consoles that are running supported 32-bit operating systems.

Power Executive supports a subset of the operating systems supported by IBM Director. Specifically, these operating systems are supported for Power Executive Server and Power Executive:

- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel® x86

- SUSE LINUX Enterprise Server 9 for x86
- Windows Server 2003, Enterprise, Standard, and Web Editions

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## Preparing to install Power Executive

Use this section to ensure that your environment is set up properly for the installation and use of Power Executive.

### Checking all prerequisites

Ensure that all prerequisites have been met before you install and use Power Executive.

The following prerequisites are specific to Power Executive v1.0:

- IBM Director 5.1 is installed
- BladeCenter Management extension of IBM Director is installed

### Downloading Power Executive

Use this section to ensure that your environment is set up properly for the installation and use of Power Executive.

Complete the following steps to download Power Executive from the IBM Web site:

1. Go to the overview page for Power Executive. This page is located at [www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/extensions/powerexec.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions/powerexec.html)
2. On the right side of the overview page, click the link for the download page.
3. From the download page, click the file link for the executable file that you want to download.

Table 3 lists the executable files that you can download.

*Table 3. Power Executive files that can be downloaded*

Operating system	Power Executive Component	File to download
Windows	Server or console	40k1484.exe
Linux	Server	PowerExecutive-server-1.0-1.noarch.rpm
Linux	Console	PowerExecutive-console-1.0-1.noarch.rpm

You should also download the *IBM Power Executive 1.0 Release Notes* and the *IBM Power Executive Installation and User's Guide* from this Web page.

4. Copy the downloaded file to a local drive on each management server and management console on which you want to install Power Executive. Be sure that you copy the correct file based on the operating system that the management server or management console is using.

---

## Installing Power Executive on systems running Windows

This section provides instructions for installing Power Executive on systems that are running Windows..

If you are installing Power Executive on systems that are running Linux, see "Installing Power Executive on systems running Linux" on page 13.

Complete the following steps to install Power Executive on a system that is running Windows:

1. If IBM Director Server or IBM Director Console is running, close them.
2. From the system on which you want to install Power Executive, run the executable file that you downloaded.

**Note:** The operating-system account that is used to install Power Executive must have at least local Administrator authority.

The Power Executive Setup program starts. After several seconds, the welcome window opens.

3. Click **Next**. The License Agreement window opens.
4. Read the license agreement, click **I accept the terms in the license agreement**, and click **Next**. The Ready to Install the Program window opens.
5. Click **Install**.
  - If you are installing Power Executive Server and IBM Director Server is running, then a notification window opens that describes that the IBM Director service must be stopped during the installation of Power Executive. After the Power Executive installation is completed, the IBM Director service is restarted. Click **Next** to continue the installation. The Installing IBM Power Executive window opens. The progress of the installation is displayed.
  - If you are installing Power Executive Console or Power Executive Server when IBM Director Server is not running, the Installing IBM Power Executive window opens. The progress of the installation is displayed.

When the installation is completed, the InstallShield Wizard Completed window opens.

6. Click **Finish**.

---

## Installing Power Executive on systems running Linux

This section provides instructions for installing Power Executive on systems that are running Linux.

If you are installing Power Executive on systems that are running Windows, see “Installing Power Executive on systems running Windows” on page 12.

Complete the following steps to install Power Executive on a system that is running Linux:

**Note:** If you are installing Power Executive Server and IBM Director Server is running, then this installation stops the IBM Director service before the Power Executive installation begins. After the Power Executive installation is completed, the IBM Director service is restarted.

1. From the system on which you want to install Power Executive, stop the IBM Director Service by entering the following command at the command prompt:  
twgstop
2. Run the executable file that you downloaded:
  - On systems where you are installing Power Executive Server, enter the following command at the command prompt:  
rpm -iv PowerExecutive-server-1.0-1.noarch.rpm
  - On systems where you are installing Power Executive Console, enter the following command at the command prompt:  
rpm -iv PowerExecutive-console-1.0-1.noarch.rpm

**Note:** The operating-system account that is used to install Power Executive must have at least local Administrator authority.

3. After Power Executive is installed, start the IBM Director Service:  
twgstart

---

## Uninstalling Power Executive on systems running Windows

This section provides instructions for uninstalling Power Executive on systems that are running Windows..

If you are uninstalling Power Executive on systems that are running Windows, see "Uninstalling Power Executive on systems running Windows."

Complete the following steps to uninstall Power Executive on systems that are running Windows:

1. Click **Start > Settings > Control Panel**. The Control Panel window opens.
2. Double-click **Add/Remove Programs**. The Add/Remove Programs window opens.
3. Click the currently installed program IBM Power Executive ; then click **Change/Remove**.
4. Follow any further instructions on the screen.

---

## Uninstalling Power Executive on systems running Linux

This section provides instructions for uninstalling Power Executive on systems that are running Linux.

If you are uninstalling Power Executive from systems that are running Windows, see "Uninstalling Power Executive on systems running Windows."

Complete the following steps to uninstall Power Executive from a Linux system:

1. From the system on which you want to uninstall Power Executive, stop the IBM Director Service by entering the following command at the command prompt:  
twgstop
2. Run the uninstallation program by entering one of the following commands:
  - On systems where you are uninstalling Power Executive Server, enter the following command at the command prompt:  
rpm -ev PowerExecutive-server
  - On systems where you are uninstalling Power Executive Console, enter the following command at the command prompt:  
rpm -ev PowerExecutive-console
3. After Power Executive is uninstalled, start the IBM Director Service by entering the following command:  
twgstart



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## Chapter 3. Using Power Executive

This chapter provides information about using Power Executive to monitor and collect power consumption data, manage trend data, and export data from Power Executive.

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### Monitoring power consumption data

Use Power Executive to display details and summaries about chassis objects and power objects.

You can display the following details and summaries:

- For a group of chassis, you can display details and summary information.
- For an individual chassis, you can display details and summary information.
- For an individual power domain, you can display details and summary information
- For an individual power object, you can display details

### Displaying details about a group of chassis

This section describes the details that Power Executive provides about a group of chassis objects.

Complete the following steps to display details about a group of chassis objects:

1. From IBM Director Console, drag the Power Executive task onto a group of chassis objects.
2. In the navigation pane of the Power Executive window, look at the information in the detail pane.

Each row in the table corresponds to one chassis object in the group. All power numbers in the table represent alternating current (ac) power.

The last row of the table summarizes information about the chassis objects in the group. For more information, see “Displaying summary information about a group of chassis” on page 16.

Table 4 describes the information that is displayed for each chassis in the group.

*Table 4. Detail information about a group of chassis*

Column title	Description
Name	The name of the chassis object.
Power Collection	The status of data collection. Values are Enabled, Disabled, and Offline.  The offline status is used when data collection is enabled, but the BladeCenter management module is not responsive. The offline status reflects only whether the BladeCenter management module is responsive to Power Executive. It is not an indicator of system health.

Table 4. Detail information about a group of chassis (continued)

Column title	Description
Power in Use (Watts)	The sum of the power in use by all power domains in the chassis. This value is measured in watts.  If no value is displayed, then data to determine this value is unavailable.
Static Max Power as Configured (Watts)	The sum of the static maximum power of all power domains in the chassis. This value is measured in watts. The static maximum power is the nameplate power as reported by vital product data (VPD).
Ambient Temperature (Celsius)	The current ambient (inlet) temperature of the chassis. This value is measured in Celsius degrees.
Acoustic Mode	Whether acoustic mode is in use for the chassis. Values are Enabled or Disabled. For information about acoustic mode, see the documentation that comes with the BladeCenter management module that is in the affected chassis.
Thermal Load (BTU/hr)	An estimate, based on the power in use, of the thermal load placed on the surrounding environment by this chassis.  The following formula is used to determine the estimate that is displayed:  1 watt = 3,412 BTU/hour

## Displaying summary information about a group of chassis

This section describes the summary information that Power Executive provides about a group of chassis objects.

Complete the following steps to display summary information about a group of chassis objects:

1. From IBM Director Console, drag the Power Executive task onto a group of chassis objects.
2. In the navigation pane of the Power Executive window, look at the summary information in the last row of the detail pane.

Table 5 describes the summary information that is displayed about a group of chassis objects. All power numbers in the summary row represent alternating current (ac) power.

Table 5. Summary information about a group of chassis

Column title	Description
Name	The name of the group that is summarized.
Power Collection	Not used.
Power in Use (Watts)	The sum of the power in use of all chassis in the group. This value is measured in watts.  If no value is displayed, then data to determine this value is unavailable.
Static Max Power as Configured (Watts)	The sum of the static maximum power of all chassis in the group. This value is measured in watts. The static maximum power is the nameplate power as reported by vital product data (VPD).

Table 5. Summary information about a group of chassis (continued)

Column title	Description
Ambient Temperature (Celsius)	Not used.
Acoustic Mode	Not used.
Thermal Load (BTU/hr)	The sum of the thermal load of all chassis in the group. This value is measured in British thermal units (Btus) per hour.  If no value is displayed, then data to determine this value is unavailable.

## Displaying details about an individual chassis

This section describes the details that Power Executive provides about an individual chassis object.

Complete the following steps to display details about an individual chassis object:

1. From IBM Director Console, drag the Power Executive task onto a chassis object.
2. In the navigation pane of the Power Executive window, look at the information in the detail pane.

Each row in the table corresponds to one power domain in the chassis. All power numbers in the table represent alternating current (ac) power.

The last row of the table summarizes information about the power domains in the chassis. For more information, see “Displaying summary information about an individual chassis” on page 18.

Table 6 describes the information that is displayed for each power domain in a chassis.

Table 6. Detail information about an individual chassis

Column title	Description
Name	The name of the power domain.
Power in Use (Watts)	The sum of the power in use by all power objects in the power domain. This value is measured in watts.  If no value is displayed, then data to determine this value is unavailable.
Static Max Power as Configured (Watts)	The sum of the static maximum power of all power domains in the chassis. This value is measured in watts. The static maximum power is the nameplate power as reported by vital product data (VPD).
Redundancy Status	The redundancy in the power domain. Values are one of the following: <ul style="list-style-type: none"> <li>• Redundant Power Available</li> <li>• Non-Redundant Power Available</li> <li>• No Power Available</li> </ul> For information about power management policy settings, including redundancy in the power domain, see the documentation that comes with the BladeCenter management module that is in the affected chassis.

Table 6. Detail information about an individual chassis (continued)

Column title	Description
Oversubscription Policy	<p>The oversubscription policy that is in use by the chassis. Values are one of the following:</p> <ul style="list-style-type: none"> <li>• Redundant without Performance Impact</li> <li>• Redundant with Performance Impact</li> <li>• Non-Redundant</li> </ul> <p>For information about oversubscription policies, see the documentation that comes with the BladeCenter management module that is in the affected chassis.</p>

## Displaying summary information about an individual chassis

This section describes the summary information that Power Executive provides about an individual chassis.

Complete the following steps to display summary information about an individual chassis:

1. From IBM Director Console, drag the Power Executive task onto a chassis object.
2. In the navigation pane of the Power Executive window, look at the summary information in the last row of the detail pane.

Table 7 describes the summary information that is displayed about an individual chassis. All power numbers in the summary row represent alternating current (ac) power.

Table 7. Summary information about an individual chassis

Column title	Description
Name	The name of the chassis that is summarized.
Power in Use (Watts)	<p>The sum of the power in use by all power domains in the chassis. This value is measured in watts.</p> <p>If no value is displayed, then data to determine this value is unavailable.</p>
Static Max Power as Configured (Watts)	The sum of the static maximum power of all power domains in the chassis. This value is measured in watts. The static maximum power is the nameplate power as reported by vital product data (VPD).
Redundancy Status	Not used.
Oversubscription Policy	Not used.

## Displaying details about individual power domains

This section describes the details that Power Executive provides about an individual power domain within a chassis.

Complete the following steps to display details about an individual power domain:

1. From IBM Director Console, drag the Power Executive task onto the chassis that contains the power domain.

2. In the navigation pane of the Power Executive window, expand the tree structure until you see the power domain.
3. Click the name of the power domain.
4. Look at the information about the power domain in the detail pane.

Each row in the table corresponds to one bay, which is generally one power object, within the power domain. The power numbers for modules in the table represent direct current (dc) power.

The last row of the table summarizes information about the power objects in the power domain. The power numbers in the summary row represent alternating current (ac) power. For more information, see “Displaying summary information about individual power domains” on page 20.

Table 8 describes the information that is displayed for each power object in a power domain.

*Table 8. Detail information about power objects in a power domain*

Column title	Description
Name	The name of the power object.
Type	The type of power object. Values are one of the following: <ul style="list-style-type: none"> <li>• Power Module</li> </ul> <p><b>Note:</b> The power consumption listed for the power module represents the amount of power lost in the power module.</p> <ul style="list-style-type: none"> <li>• Blade Server</li> <li>• I/O Module</li> <li>• Management Module</li> <li>• Blower Module</li> <li>• Media Tray</li> <li>• Midplane</li> </ul>
Bay	The number of the bays that this power object occupies.
Power Meter Supported	(blade servers only) Whether a power meter is enabled on this processor. Values are Yes and No.
Power in Use (Watts)	The power-in-use of the power object. <ul style="list-style-type: none"> <li>• For a blade server that has enabled the power meter, this column displays the actual watts being consumed as reported by the power meter.</li> </ul> <p>If no value is displayed, then data to determine this value is unavailable.</p> <ul style="list-style-type: none"> <li>• For all other blade servers and all power objects, this column displays the same value as that displayed by the Static Max Power as Configured column, reduced by the derating percentage. For more information, see “Setting the derating power factor” on page 22.</li> </ul> <p>In both cases, this value is measured in watts.</p>
Static Max Power as Configured (Watts)	The nameplate power as reported by vital product data (VPD).

Table 8. Detail information about power objects in a power domain (continued)

Column title	Description
Max Power in Use (Watts)	<p>The maximum watts consumed during the current measurement interval.</p> <ul style="list-style-type: none"> <li>For a blade that has enabled the power meter, this column displays the value as reported by the power meter.</li> </ul> <p>If no value is displayed, then data to determine this value is unavailable.</p> <ul style="list-style-type: none"> <li>For all other blades and all power objects, this column displays the same value as that displayed by the Static Max Power as Configured column.</li> </ul> <p>In both cases, this value is measured in watts.</p>
Max Power in Use Time	<p>(Blade servers that have enabled the power meter only) The time at which the maximum power value was recorded.</p> <p>If no value is displayed, then data to determine this value is unavailable.</p>

## Displaying summary information about individual power domains

This section describes the summary information that Power Executive provides about an individual power domain.

Complete the following steps to display summary information about an individual power domain:

1. From IBM Director Console, drag the Power Executive task onto the chassis object that contains the power domain.
2. In the navigation pane of the Power Executive window, expand the tree structure until you see the power domain.
3. Click the name of the power domain.
4. Look at the summary information about the power domain in the last row of the detail pane.

Table 9 describes the summary information that is displayed about an individual power domain. The power numbers in the summary row represent alternating current (ac) power.

Table 9. Summary information about an individual power domain

Column title	Description
Name	The name of the power domain that is summarized.
Type	Not used.
Bay	Not used.
Power Meter Supported	Not used.
Power in Use (Watts)	<p>The sum of the power-in-use of all power objects in the power domain. This value is measured in watts.</p> <p>If no value is displayed, then data to determine this value is unavailable.</p>
Static Max Power as Configured (Watts)	The sum of the static maximum power of all power objects in the power domain. This value is measured in watts. The static maximum power is the nameplate power as reported by vital product data (VPD).

Table 9. Summary information about an individual power domain (continued)

Column title	Description
Max Power in Use (Watts)	Not used.
Max Power in Use Time	Not used.

## Displaying details about individual power objects

This section describes the details that Power Executive provides about individual power objects.

Complete the following steps to display details about an individual power object:

1. From IBM Director Console, drag the Power Executive task onto the chassis object that contains the power object.
2. In the navigation pane of the Power Executive window, expand the tree structure until you see the power object.
3. Click the name of the power object.
4. Look at the information about the power object in the detail pane.

Each row in the table corresponds to one power object in the chassis.

Table 10 describes the information that is displayed for an individual power object. The power numbers in the table represent direct current (dc) power.

Table 10. Detail information about an individual power object

Field Name	Description
Name	The name of the power object. No value is displayed when the bay is not populated.
Type	The type of power object. Values are one of the following: <ul style="list-style-type: none"> <li>• Power Module</li> </ul> <p><b>Note:</b> The power consumption listed for the power module represents the amount of power lost in the power module.</p> <ul style="list-style-type: none"> <li>• Blade Server</li> <li>• I/O Module</li> <li>• Management Module</li> <li>• Blower Module</li> <li>• Media Tray</li> <li>• Midplane</li> </ul>
Bay	The number of the bay that this power object occupies.
Power Meter Supported	Whether a power meter is enabled on this processor. For a blade server, values are Yes and No. For any other power object, the value is always No. No value is displayed when the bay is not populated.

Table 10. Detail information about an individual power object (continued)

Field Name	Description
Power in Use (Watts)	<p>The power-in-use of the power object.</p> <ul style="list-style-type: none"> <li>For a blade server that has enabled the power meter, this column displays the actual watts being consumed as reported by the power meter.</li> <li>If no value is displayed, then data to determine this value is unavailable.</li> <li>For all other blade servers and all power objects, this column displays the same value as that displayed by the Label Power column, reduced by the derating percentage.</li> </ul> <p>In both cases, this value is measured in watts.</p>
Static Max Power as Configured (Watts)	The nameplate power as reported by Vital Product Data (VPD).
Derate Static Max Power to (Percent)	The percentage of the static maximum power to use when estimating the power-in-use for blade servers that have not enabled the power meter and for all other power objects. The default value is 100% which means that the static maximum power is not reduced when used as an estimate for the power-in-use.
Max Power in Use (Watts)	<p>The maximum watts consumed during the current measurement interval.</p> <ul style="list-style-type: none"> <li>For a blade server that has enabled the power meter, this column displays the value as reported by the power meter.</li> <li>If no value is displayed, then data to determine this value is unavailable.</li> <li>For all other blade servers and all power objects, this column displays the same value as that displayed by the Label Power column.</li> </ul> <p>In both cases, this value is measured in watts.</p>
Max Power in Use Time	<p>(Blade servers that have enabled the power meter only) The time at which the maximum power value was recorded.</p> <p>If no value is displayed, then data to determine this value is unavailable.</p>
Current CPU Throttle Values (Percent)	(Blade server only) A comma-separated list of the current throttle values of each CPU in the blade server. A value of 100% indicates that a CPU is running at maximum performance (full throttle). For information about throttle levels, see the documentation that comes with the BladeCenter management module that is in the affected chassis.
Preset Blade Throttle Value (Watts)	(Blade server only) The preset throttle level of the chassis that contains this power object. For information about throttle levels, see the documentation that comes with the BladeCenter management module that is in the affected chassis.

## Setting the derating power factor

You can set the derating power factor for an individual power object. By default, the derating power factor is 100 percent, which means that the reported power is not derated at all.

The derating factor is the percentage of the static maximum power that is used when estimating the power-in-use for blade servers that have not enabled the



power meter and for all other power objects. The derating factor does not apply to power objects when information about the actual power consumed is available from the BladeCenter management module.

Complete these steps to set the derating factor:

1. From IBM Director Console, start Power Executive.
2. In the navigation pane of the Power Executive window, select the power object that you want to derate. You cannot derate power for a chassis or a power domain, you must select a lower-level power object.
3. From the Power Executive window, click **Edit → Derate Power**. The Power Executive Derate Power Factor window opens.
4. From the Power Executive Derate Power Factor window, enter a number that represents the percent of the static maximum power that you want to use when estimating the power consumption of the power object.
5. Click **OK**.

---

## Collecting power consumption data

This section provides information about using Power Executive to collect power consumption data.

By default, power information is collected for all chassis objects that are displayed in Power Executive.

### Suspending data collection

You can suspend data collection on any chassis displayed in Power Executive.

You might decide to suspend data collection to decrease the amount of disk space required in the Power Executive database. Another reason might be to reduce the network load from polling for new information about power objects within a chassis.

Data collection cannot be suspended for individual power objects within a chassis.

Complete these steps to suspend data collection for a chassis:

1. From IBM Director Console, start Power Executive.
2. In the navigation pane of the Power Executive window, select the chassis for which you want to suspend data collection.
3. From the Power Executive window, click **Edit → Suspend Data Collection**.

### Resuming data collection

You can resume data collection for a chassis displayed in Power Executive in which data collection was previously suspended.

Resuming data collection increases the amount of disk space required in the Power Executive database. It also increases the network load as it polls for new information about the power objects within the chassis.

Complete these steps to resume data collection for a chassis:

1. From IBM Director Console, start Power Executive.
2. In the navigation pane of the Power Executive window, select the chassis for which you want to resume data collection.

3. From the Power Executive window, click **Edit** → **Resume Data Collection**.

---

## Managing trend data

This section provides information about using Power Executive to manage trend data.

Trend data is displayed in the trend pane of the Power Executive window. For more information, see “Trend pane” on page 7.

### Managing collection of trend data

Trend data can be managed using the Edit menu of Power Executive.

Historical trend data is written to the Power Executive database. You can control how often and how much historical trend data is written to the database and when trend data is deleted from the database.

However, when the Power Executive database cannot expand, Power Executive deletes the oldest historical data from the database to free up room for new data that it is collecting.

Complete these steps to affect the trend data written to the Power Executive database:

1. From IBM Director Console, start Power Executive.
2. From the Power Executive window, click **Edit** → **Manage Trend Data**. The Manage Trend Data window opens.
3. Complete the fields on the Manage Trend Data window as follows:
  - In the **Short-term polling interval in minutes** field, enter the number of minutes in the short-term polling cycle. The default value is one day.  
Once every short-term polling interval, Power Executive collects temperature and power data from the systems under its control. Each short-term polling interval, Power Executive checks each bay to see if it is populated or not, and if it is occupied by a different power object from last time. The data collected during these cycles is considered to be short-term polling data. Lower values in this field could impact network performance on the systems involved.
  - In the **Long-term polling interval in minutes** field, enter the number of minutes in the long-term polling cycle. The default value is ten days. Power Executive uses the long-term polling cycle to determine which data is considered to be long-term data. Long-term data is the trend data that can be displayed on the trend pane.
  - In the **Number of days to keep short-term trend data** field, enter the number of days that Power Executive identifies data as short-term data before considering it to be long-term data. The default value is 31 days.
  - In the **Number of days to keep long-term trend data** field, enter the number of days that Power Executive keeps long-term data before deleting it. The default value is 365 days.
4. Click **OK**.

### Creating a custom time interval for the trend pane

You can create a custom time interval for use by the trend pane instead of using one of the predefined time intervals.

Complete the following steps to create a custom time interval for the trend pane:

- From IBM Director Console, start Power Executive.
- From the trend pane in the Power Executive window, click **Custom** as the trend data interval. The Power Executive Custom window opens.
- Complete the fields on the Power Executive Custom window as follows:
  - In the first row of fields, enter the day and time from which the trend data should start. You need to define the month, day, year, hour, and minute from which to start displaying trend data.
  - In the second row of fields, enter the day and time at which the trend data should stop. You need to define the month, day, year, hour, and minute at which to stop displaying trend data.
- Click **OK**.

---

## Exporting data from Power Executive

This section provides information about exporting data from Power Executive.

You can export the following types of data:

- Summary data from the details pane
- Power meter from the trend pane
- Trend graph from the trend pane
- Trend table from the trend pane

### Exporting summary data

Use the File menu in Power Executive to export summary data from the detail pane.

Power Executive can save the exported summary data in CSV, XML, or HTML format.

Complete the following steps to export the summary data in the detail pane:

1. From IBM Director Console, start Power Executive.
2. From the Power Executive window, click **File** → **Export** → **Summary Table**. The Export Summary Table window opens.
3. Select the directory where you want to export the data.
4. In the **File Name** field, type a name for the file.
5. In the **Files of Type** field, select the type of file that you want to create.
6. Click **OK**.

### Exporting the power meter

Use the File menu in Power Executive to export the power meter from the trend pane.

Power Executive saves the exported power meter in JPEG format.

Complete the following steps to export the power meter:

1. From IBM Director Console, start Power Executive.
2. From the Power Executive window, click **File** → **Export** → **Power Meter**. The Export Power Meter window opens.
3. Select the directory where you want to export the data.

4. In the **File Name** field, type a name for the file.
5. Click **OK**.

## Exporting a trend graph

Use the File menu in Power Executive to export a trend graph from the trend pane.

Power Executive saves the exported power meter in JPEG format.

Complete the following steps to export the trend graph:

1. From IBM Director Console, start Power Executive.
2. From the Power Executive window, click **File** → **Export** → **Trend Graph**. The Export Trend Graph window opens.
3. Select the directory where you want to export the data.
4. In the **File Name** field, type a name for the file.
5. Click **OK**.

## Exporting a trend table

Use the File menu in Power Executive to export a trend table from the trend pane.

Power Executive can save the exported trend table in CSV, XML, or HTML format.

Complete the following steps to export the data in a trend table:

1. From IBM Director Console, start Power Executive.
2. From the Power Executive window, click **File** → **Export** → **Trend Table**. The Export Trend Table window opens.
3. Select the directory where you want to export the data.
4. In the **File Name** field, type a name for the file.
5. In the **Files of Type** field, select the type of file that you want to create.
6. Click **OK**.

---

## Understanding events that affect Power Executive

This section provides information about the IBM Director events and Power Executive events that affect the information that is displayed in Power Executive.

Before using Power Executive, you should use the Management Processor Configuration subtask of the Server Configuration Manager task (formerly Management Processor Assistant (MPA)) to configure an alert-forwarding profile for the chassis that contain the power objects that you plan to monitor. In the alert-forwarding profile, the connection type must be set to "IBM Director Comprehensive" and the IP address must be set to the IP address of the management server that is being used to monitor power consumption with Power Executive. Further, this management server must be the only server that is configured and enabled to receive alerts from the BladeCenter chassis that you plan to target.

If an alert-forwarding profile is not created for a chassis, Power Executive cannot receive any events for that chassis.

**Note:** The IBM Director event log might not contain all events that are reported in Power Executive. Further, the timestamps on events is different between the

IBM Director event log and the trend pane in Power Executive. The IBM Director event log records the time that the defect occurred. The Power Executive events reflect the time that Power Executive detected the event.

## Events that cause refresh operations

Some events from Server Configuration Manager (formerly Management Processor Assistant (MPA)) cause Power Executive to poll for new information and refresh the Power Executive window as needed. Server Configuration Manager is an IBM Director task that is used to create or update server configuration profiles, which include management of service processors in xSeries and Netfinity® servers.

Table 11 describes the severities that can be assigned to each event.

*Table 11. Event severities and their meanings*

Event severity	Description
Critical	Severe events that signal that the system might not be functioning.
Warning	Serious events that could progress to critical severity.
Harmless	Any event that is not severe or serious. These events are not necessarily errors.

Table 12 describes the events that can cause refreshes of the information in the Power Executive window.

*Table 12. Events that affect the information in Power Executive*

Severity	Category	Description
Critical	Multiple Blower Failure	Both blowers in the system failed.
Critical	Power Failure	A system power supply failed.
Critical	Temperature	A monitored temperature exceeded its critical threshold value. (If a critical temperature condition is detected on a blade server, the blade server is automatically shutdown and powered-off.)
Critical	Multiple I/O Module Failure	Multiple I/O modules failed or were removed.
Warning	Single Blower Failure	One blower failed.
Warning	Temperature	A monitored temperature exceeded its warning threshold value. (This event does not initiate an automatic system shutdown.)
Warning	Redundant Module Failure	A redundant module failed or was removed.
Warning	Blade Throttle	A BladeCenter is throttled in order to maintain a power consumption within certain bounds. A recovery event is also sent.
Warning	Power Management	A power-management event was detected, such as mismatched power modules in a power domain, demand exceeding capacity in a domain, or components not being allowed to power on due to insufficient power.
Harmless	Power-On	A blade server or I/O module was turned on.

Table 12. Events that affect the information in Power Executive (continued)

Severity	Category	Description
Harmless	Power-Off	A module in the system was turned off.

## Events reported on the trend pane

Power Executive displays information about events that it generates in the trend pane.

Specifically, Power Executive generates and displays event information with the following severities:

- These events have a warning severity:
  - Stop of Power Executive Server
  - Suspend data collection for a chassis
  - Offline of a chassis
  - Removal of a module from a chassis
  - Long-term data deleted from the Power Executive database.
- These events have a harmless severity:
  - Start of Power Executive Server
  - Resume data collection for a chassis
  - Online of a chassis
  - Insertion of a module from a chassis
  - Addition of a chassis.
  - Enable or disable acoustic mode.
  - Changes to the oversubscription policy.
  - Short-term data coalesced.

Events that are generated by Power Executive are collected with other trend data and stored in the Power Executive database. These events let you know why historical data might be missing for one or more chassis.

In the trend graph, these events are displayed as follows:

- Events with a warning severity are shown as yellow diamonds.
- Events with a harmless severity are shown as green triangles.

You can mouse-over each event in the trend graph to obtain a description of the event that occurred.

In the trend table, these events are displayed in the Event column.

---

## Chapter 4. Troubleshooting

Use this section to troubleshoot and resolve problems with Power Executive.

---

### Contacting customer support

If you need help, service, or technical assistance or just want more information about IBM products, you can find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation system, and whom to call for service, if it is necessary.

#### Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD or in the *IntelliStation Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at [www.ibm.com/pc/support/](http://www.ibm.com/pc/support/) to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

#### Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that is included with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to [www.ibm.com/pc/support/](http://www.ibm.com/pc/support/) and follow the instructions. Also, you can order publications through the IBM Publications

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## **Getting help and information from the World Wide Web**

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is [www.ibm.com/eserver/xseries/](http://www.ibm.com/eserver/xseries/). The address for IBM IntelliStation information is [www.ibm.com/pc/intellistation/](http://www.ibm.com/pc/intellistation/).

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## **Software service and support**

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to [www.ibm.com/services/sl/products/](http://www.ibm.com/services/sl/products/).

For more information about Support Line and other IBM services, go to [www.ibm.com/services/](http://www.ibm.com/services/), or go to [www.ibm.com/planetwide/](http://www.ibm.com/planetwide/) for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).



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## Abbreviations, acronyms, and glossary

### Abbreviation and acronym list

This topic lists abbreviations and acronyms used in the Power Executive documentation.

Table 13. Abbreviations and acronyms used in Power Executive documentation

Abbreviation or acronym	Definition
ac	alternating current
BTU	British Thermal Unit
CSV	comma-separated value
dc	direct current
GUI	graphical user interface
HTML	hypertext markup language
I/O	input/output
IP	Internet Protocol
MPA	Management Processor Assistant
VPD	vital product data

---

### Glossary

This topic provides definitions of terms that are used in the Power Executive product.

#### A

**ac** See *alternating current*.

#### alternating current

An electric current that reverses its direction at regularly recurring intervals.

#### B

##### blade server

An IBM BladeCenter server. A high-throughput, two-way, Intel Xeon-based server on a card that supports symmetric multiprocessors {SMP}.

##### BladeCenter chassis

A BladeCenter unit that acts as an enclosure. This 7-U modular chassis can contain up to 14 blade servers. It enables the individual blade servers to share resources, such as the management, switch, power, and blower modules.

##### British thermal unit

An English unit of measure for heat produced in one hour.

**BTU** See *British thermal unit*.

#### C

##### chassis

The metal frame in which various electronic components are mounted.

#### D

**dc** See *direct current*.

##### direct current

An electric current that flows in a single direction and at a constant voltage.

##### discovery

The process of finding resources within an enterprise, including finding the new location of monitored resources that were moved.

#### E

**event** An occurrence of significance to a task or system, such as the completion or failure of an operation. There are two types of events: alert and resolution.

##### event action.

The action that IBM Director takes in response to a specific event or events

##### event-action plan.

A user-defined plan that determines how IBM Director manages certain events. An event action plan comprises one or more event filters and one or more customized event actions.

##### Event Action Plan wizard.

An IBM Director Console wizard that can be used to create simple event action plans.

##### event filter.

A filter that specifies the event criteria for an event action plan. Events must meet the criteria specified in the event filter in order to be processed by the event action plan to which the filter is assigned to.

**extension.**

See *IBM Director extension*.

## **G**

**group.** A logical set of managed objects. Groups can be dynamic, static, or task-based..

## **I**

### **IBM Director Console.**

A component of IBM Director software. When installed on a system, it provides a graphical user interface (GUI) for accessing IBM Director Server. IBM Director Console transfers data to and from the management server using TCP/IP.

### **IBM Director environment**

The complex, heterogeneous environment managed by IBM Director. It includes systems, BladeCenter chassis, software, SNMP devices.

### **IBM Director extension.**

A tool that extends the functionality of IBM Director. Some of the IBM Director extensions are BladeCenter Management, Capacity Manager, ServeRAID Manager, Remote Deployment Manager, and Power Executive.

### **IBM Director Server.**

The main component of IBM Director software. When installed on the management server, it provides basic functions such as discovery of managed systems, persistent storage of configuration and management data, an inventory database, event listening, security and authentication, management console support, and administrative tasks.

## **L**

### **Level-0 managed system**

An IBM or non-IBM server, desktop computer, workstation, or mobile computer, that can be managed by IBM Director but does not have any IBM Director software installed on it.

## **M**

### **managed group**

A group of systems or objects managed by IBM Director.

### **managed object**

An item managed by IBM Director. In IBM Director Console, a managed object is represented by an icon that shows its type (such as chassis, cluster, system, or scalable system, for example).

### **managed object ID**

A unique identifier for each managed object. It is the key value used by IBM Director database tables.

### **managed system**

A system that is being controlled by a given system management application, for example, a system managed by IBM Director.

### **management console**

A system (server, desktop computer, workstation, or mobile computer) on which IBM Director Console is installed.

### **management module**

The BladeCenter component that handles system-management functions. It configures the chassis and switch modules, communicates with the blade servers and all I/O modules, multiplexes the keyboard/video/mouse (KVM), and monitors critical information about the chassis and blade servers.

### **management server**

The server on which IBM Director Server is installed.

### **module**

A BladeCenter component that is inserted in a bay in a chassis and whose power consumption data can be monitored by Power Executive. Modules include power modules (power supplies), blade servers, I/O modules, BladeCenter management modules, blower modules, and media trays.

## **O**

### **out-of-band communication**

Communication that occurs through a modem or other asynchronous connection, for example, service processor alerts sent through a modem or over a LAN. In an IBM Director environment, such communication is independent of the operating system and interprocess communication (IPC).

## **P**

### **power object**

An IBM Director managed object that can be managed by Power Executive. A power object can be a group, a chassis, a power domain, or a module.

## **S**

### **switch module**

The BladeCenter component that provides network connectivity for the BladeCenter chassis and blade servers. It also provides interconnectivity between the management module and blade servers.

### **system**

The computer and its associated devices and programs.

## **T**

### **target system**

A managed system on which an IBM Director task is performed.

## **V**

### **vital product data (VPD)**

Information that uniquely defines the system, hardware, software, and microcode elements of a processing system.

**VPD** See *vital product data*.



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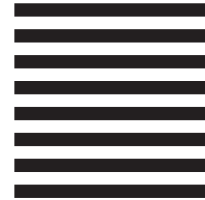
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