IBM

IBM Systems

IBM Director Capacity Manager
Installation and User's Guide

Version 5.10

IBM

IBM Systems

IBM Director Capacity Manager Installation and User's Guide

Version 5.10

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

Contents

Figures

Tables

About this book

This book provides information about installing and using IBM Director Capacity Manager.

Who should read this book

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.

Related information

This topic provides links to additional information related to IBM Director.

IBM Director resources on the World Wide Web

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

IBM Director information center
> publib.boulder.ibm.com/infocenter/eserver/
> v1r2/topic/diricinfo/fqm0_main.html

> Updated periodically, the IBM Director information center contains the most up-to-date documentation available on a wide range of topics.

IBM Director Web site on ibm.com®
> www.ibm.com/servers/eserver/xseries/
> systems_management/ibm_director/

> The IBM Director Web site on ibm.com has links to downloads and documentation for all currently supported versions of IBM Director. Information on this site includes:

> - IBM Director 5.10 - downloads and documentation
> - IBM Director 4.22 - downloads and documentation
> - IBM Director 4.22 Upward Integration Modules (UIMs) - downloads and documentation
> - IBM Director 4.21 - downloads and documentation
> - IBM Director 4.20 - downloads and documentation
> - IBM Director Hardware and Software Compatibility document - lists supported @server and IBM® xSeries® systems, as well as all supported operating systems. It is updated every 6 to 8 weeks.

- Printable documentation for IBM Director - available in Portable Document Format (PDF) in several languages

IBM Systems Software information center

www.ibm.com/servers/library/infocenter/

This Web page provides information about IBM Virtualization Engine™, IBM Director, and other topics.

IBM ServerProven® page

www.ibm.com/pc/us/compat/index.html

This Web page provides information about IBM xSeries, BladeCenter®, and IntelliStation® hardware compatibility with IBM Director.

IBM Systems Management Software: Download/Electronic Support page

www.ibm.com/servers/eserver/xseries/
systems_management/ibm_director/

Use this Web page to download IBM systems-management software, including IBM Director. Check this Web page regularly for new IBM Director releases and updates.

IBM Servers

www.ibm.com/servers/

This Web page on ibm.com links to information, downloads, and IBM Director extensions such as Remote Deployment Manager, Capacity Manager, Systems Availability and Software Distribution (Premium Edition) for IBM servers:
- IBM BladeCenter
- IBM iSeries™
- IBM pSeries®
- IBM xSeries
- IBM zSeries®

IBM Redbooks™

www.ibm.com/redbooks/

You can download the following documents from the IBM Redbooks Web page. You also might want to search this Web page for documents that focus on specific IBM hardware; such documents often contain systems-management material.

Note: Be sure to note the date of publication and to determine the level of IBM Director software to which the Redbooks publication refers.

- *Creating a Report of the Tables in the IBM Director 4.1 Database* (TIPS0185)
- *IBM Director Security* (REDP-0417-00)
- *IBM eServer™ BladeCenter Systems Management with IBM Director V4.1 and Remote Deployment Manager V4.1* (REDP-3776-00)
- *Implementing Systems Management Solutions using IBM Director* (SG24-6188)
- *Integrating IBM Director with Enterprise Management Solutions* (SG24-5388)
- *Managing IBM TotalStorage® NAS with IBM Director* (SG24-6830)
- *Monitoring Redundant Uninterruptible Power Supplies Using IBM Director* (REDP-3827-00)

Remote Supervisor Adapter

Remote Supervisor Adapter overview
> www.ibm.com/support/docview.wss?uid=psg1MIGR-4UKSML

> This Web page includes links to the *Remote Supervisor Adapter User's Guide* and *Remote Supervisor Adapter Installation Guide*.

Remote Supervisor Adapter II overview
> www.ibm.com/support/docview.wss?uid=psg1MIGR-50116

> This Web page includes information about the Remote Supervisor Adapter II.

Other documents

For planning purposes, the following documents might be of interest:
- *Planning and installation guide - IBM eServer BladeCenter (Type 8677)*
- *IBM Management Processor Command-Line Utility User's Guide version 3.00*

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 Director publication, use the form for reader's comments is provided at the back of this publication. If the form has been removed, you may address your comments to:

International Business Machines Corporation
Design & Information Development
Department CGFA
PO Box 12195
Research Triangle Park, NC 27709-9990
U.S.A.

Chapter 1. Getting started

Introducing IBM Director

This topic provides an overview of IBM Director.

IBM Director is an integrated, easy-to-use suite of tools that provide you with comprehensive systems-management capabilities to help realize maximum system availability and lower IT costs. Its open, industry-standard design enables heterogeneous-hardware management and broad operating-system support, including most Intel® microprocessor-based systems and certain IBM @server System p5®, iSeries, pSeries, System z9®, and zSeries servers.

IBM Director automates many of the processes that are required to manage systems proactively, including capacity planning, asset tracking, preventive maintenance, diagnostic monitoring, troubleshooting, and more. It has a graphical user interface that provides easy access to both local and remote systems.

IBM Director can be used in environments with multiple operating systems and integrated with robust workgroup and enterprise management software from IBM (such as Tivoli® software), Computer Associates, Hewlett-Packard, Microsoft®, NetIQ, and BMC Software.

IBM Director environment

IBM Director is designed to manage a complex environment that contains numerous servers, desktop computers, workstations, mobile computers (notebook computers), and assorted devices. IBM Director can manage up to 5000 Level-2 systems.

An IBM Director environment contains the following groups of hardware:
- One or more servers on which IBM Director Server is installed. Such servers are called *management servers*.
- Servers, workstations, desktop computers, and mobile computers that are managed by IBM Director. Such systems are called *managed systems*.
- Network devices, printers, or computers that have Simple Network Management Protocol (SNMP) agents installed or embedded. Such devices are called *SNMP devices*.
- Additional managed objects such as platforms and chassis. Collectively, all managed systems, devices, and objects are referred to as *managed objects*.

Figure 1 on page 2 shows the hardware in an IBM Director environment.
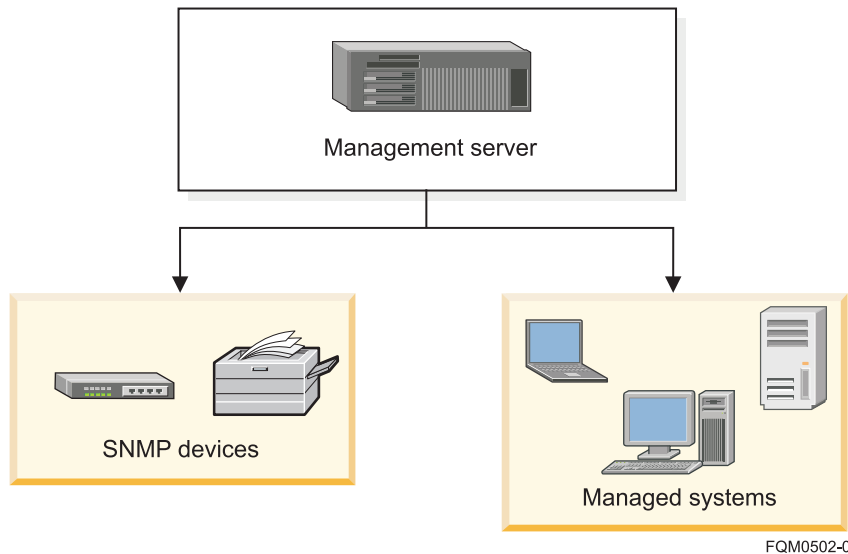
Figure 1. Hardware in an IBM Director environment

Capacity Manager

The Capacity Manager task is a resource-management planning tool that you can use to monitor critical resources, such as processor usage, hard disk capacity, memory usage, and network traffic; identify current or potential bottlenecks for an individual server or a group of servers; generate performance-analysis reports and recommends ways to improve performance and prevent diminished performance or downtime; and forecast performance trends.

Capacity Manager has three components:

Monitor Activator
Displays the status of resource and performance-analysis monitors on managed systems; you can specify which monitors are active. When new hardware is detected, corresponding monitors are activated automatically.

Report Generator
Provides Report Definitions, which you can customize for generating reports.

Report Viewer
Provides four views of your generated report data and graphs of monitor performance.

Icon	
Supported IBM Director objects	Level-2 managed systems
Supported operating systems	For detailed operating-system support information, see the IBM Director information center on the Web at publib.boulder.ibm.com/infocenter/eserver/ v1r2/topic/diricinfo/fqm0_main.html.
Availability	Extension to the standard IBM Director product, which must be purchased separately.

Required hardware or hardware limitations	Designed specifically for use on xSeries and Netfinity® servers.
Required software	None
Required protocols	None
Required device drivers	None
Mass Configuration support	No
Scheduler support	No
Files associated with this task	Any generated reports that you selected to save to a file. Unless you specify another directory in the report definition, these files are located in the following applicable directory: • (For Linux®) /opt/ibm/*director*/*reports* where: • (For Windows®) c:\Program Files\IBM*director**reports* where: • *director* is the default directory in which IBM Director Console is installed. • *reports* is the default directory where the reports are stored and exported by the user.
Events associated with this task	Capacity Manager For detailed events information, see the IBM Director information center on the Web at publib.boulder.ibm.com/infocenter/eserver/v1r2/topic/diricinfo/fqm0_main.html.

Performance

IBM Director provides a robust tool for monitoring and managing the performance of your environment, called Capacity Manager.

Performance-analysis monitors

This concept describes the performance-analysis monitors.

Performance-analysis monitors are a subset of resource monitors that are considered critical and are used to make performance recommendations. The performance-analysis monitors are activated by default when you install Capacity Manager.

These are the types of performance-analysis monitors:
• Processor usage
• Memory usage
• Disk usage
• Network traffic

Note: You must turn on all four types of performance-analysis monitors for a report to display a performance-analysis recommendation.

Capacity Manager automatically discovers new disk and LAN resource monitors and removes monitors for devices that no longer exist. Performance-analysis monitors for Windows network adapters and physical disks are discovered when the Windows network adapters and physical disks are added to the managed

system. If a checked network adapter or physical disk has been removed, Capacity Manager removes the corresponding performance-analysis monitor from the monitor list once every 24 hours or whenever the Capacity Manager Agent is restarted.

Note: Performance analysis is available for managed systems running a Windows or Linux operating system only.

Performance bottlenecks

This concept describes performance bottlenecks.

When you schedule Capacity Manager to check periodically for bottlenecks, or when you select to generate a report, the performance-analysis function looks for bottlenecks in managed-system hardware performance. When one or more performance-analysis monitors meet or exceed their preset threshold settings and you have selected the **Generate Bottleneck events** check box when you defined the report, a bottleneck event is generated. You can adjust the threshold settings on performance-analysis monitors, but you cannot change the default settings without impairing the performance-analysis function.

Corresponding to each types of performance-analysis monitors are the four types of bottlenecks:
- Processor
- Memory
- Disk
- LAN adapter

If a bottleneck is detected, two things happen:
- Each managed system with a bottleneck generates an event, and the event is displayed in the IBM Director event log.
- A report is generated and saved in the IBM\Director\reports directory (unless you specify another directory in the report definition).

When the performance-analysis function detects a bottleneck, it diagnoses the problem and determines a potential solution. The performance-analysis section of the report details the problem and recommendations.

Multiple bottlenecks can occur. For example, a disk bottleneck and a memory bottleneck can occur concurrently. In this case, the performance-analysis algorithm recognizes that insufficient memory can lead to disk thrashing, so the recommendation is to add more memory and leave the disk drives unchanged. Because systems and devices often interact in this way, each combination of bottlenecks (that is, microprocessor, memory, disk, and LAN adapter) constitutes a separate bottleneck with its own recommendation.

Often, when one bottleneck occurs, other bottlenecks are not evident because the first bottleneck slows the system. A *latent bottleneck* is one that is not evident even though the system has slowed down. Performance analysis reports a managed system or device as having a latent bottleneck if a performance monitor for that system or device exceeds the warning threshold at least 50% of the time that the performance monitor for another system or device is constrained.

Performance-analysis reports

This concept describes the performance-analysis reports.

When you create a report, you specify a report definition. A *report definition* identifies the details that you want to include in the report. You can create a customized report definition or use a predefine report definition. These predefined report definitions are included in Capacity Manager:

- Daily report to viewer
- Hourly bottleneck events to file
- Hourly report to viewer
- Monthly report to file
- Weekly report to file

You can generate a report for immediate viewing, or you can save the report to a file for later viewing.

Reports viewed from the Report Viewer window

The performance-analysis report consists of two sections:

Recommendations
Shows only the subset of details on which you have to act.

Details
Shows everything that was found and contains links so you can see a graph of the performance of the monitor in question.

The managed systems with the most severe bottlenecks appear at the top of the report list. A bottleneck that is reported in the Details section is displayed in the Recommendations section if it meets one of these criteria:

- It occurred on the last day of the report.
- It occurred more than 25% of the time, and it occurred more than any other bottleneck on that managed system.
- It has a high probability of occurring in the future. However, performance analysis must have enough data to make a reliable forecast.

Reports viewed from a saved HTML file

A report that is saved in HTML contains the following sections:

Table of Contents
Contains links to the other sections.

Report Table
Presents the same monitor and managed-system data that is also available in the Report Viewer in the Table view.

Report Information
Includes the file name, analysis start and end dates, days of the week and hours of coverage, name of the report definition, and a list of any managed systems that were requested but not included in the report.

Performance Analysis recommendations
Recommends remedies for the most serious bottlenecks.

Performance Analysis details
Includes information about the frequency and duration of both active and latent bottlenecks and their remedies.

Performance forecast

This concept describes how Capacity Manager predicts future performance.

Using the Forecast function of Capacity Manager, you can review a prediction of future performance of selected managed systems. Capacity Manager uses forecasting in these interfaces:

- In the performance-analysis section of a report. If there are no realized bottlenecks, Capacity Manager uses forecasting to predict, with a level of confidence, if and when it foresees a monitor performance bottleneck.
- In a managed-system monitor performance graph. On a graph of a selected monitor for one or more managed systems, you can click Forecast icon (▨) to see a forecast of the performance on the selected managed systems. The graph depicts both the observed data and the forecast.

To calculate future performance, Capacity Manager applies a wavelet transform to the monitor data before performing a least-squares linear regression . With this transformed data, it computes a forecast line with a 95% prediction interval. The forecast duration is equal to the duration of the observed data.

Tip: For the forecast to be valid, Capacity Manager must have a minimum of 24 days of previously collected data where the managed-system monitors have been running at least 50% of the time.

Performance forecast graph

The *forecast line* describes possible future data values that are consistent with the prediction that an actual future data value will fall within equal probability above or below the forecast line. This line is a dashed line with an arrow at the end.

The *forecast duration* is equal to your data-collection period. For example, if you have a month of collected data, the forecast will be for a month into the future.

The *prediction interval* is represented by the dotted lines above and below the forecast line. The prediction interval represents the range of data values that are located above and below the forecast line and are consistent with the prediction that an actual future data value will fall within the interval with a probability of 95%. The width of the interval depends on the variability of the observed monitor data: the greater the variability, the wider the prediction interval. The prediction interval is displayed when you request a forecast of a single managed system. Graphs of multiple managed-system forecasts do not show prediction intervals.

If you do not know how to interpret a wide prediction interval for a forecast, select a finer resolution of your data from the **Resolution** drop-down list located in the lower-right corner of the Graph pane. Your data points might have a broad variance that is hidden by averaging that occurs when data is displayed at a coarser resolution.

Notes:

1. The vertical bar at the beginning of the forecast data depicts the range.
2. The gap between the actual collected data and the beginning of the predicted data serves as a separator between these two data sets.

Chapter 2. Installing Capacity Manager

This topic describes the general procedure for installing the Capacity Manager extension for IBM Director.

Capacity Manager may be installed on both Windows and Linux platforms. Installing Capacity Manager is performed in several steps, each of which is described in a topic in this section.

1. Install Capacity Manager on the management server.

Option	Description
Windows server	"Installing Capacity Manager on a Windows server"
Linux server	"Installing Capacity Manager on a Linux server" on page 8

2. **Optional:** Install Capacity Manager user-interface components for IBM Director Console on remote management consoles.

Option	Description
Windows console	"Installing Capacity Manager on a Windows console" on page 9
Linux console	"Installing Capacity Manager on a Linux console" on page 10

> **Note:** Capacity Manager user-interface components for IBM Director Console are automatically installed on the management server when the Capacity Manager server components are installed. It is not necessary or possible to separately install Capacity Manager console components on a management server.

3. Install Capacity Manager components for IBM Director Agent on managed systems.

Option	Description
Windows systems	"Installing Capacity Manager on a managed Windows system" on page 11
Linux systems (32-bit)	"Installing Capacity Manager on a managed 32-bit Linux system" on page 11

> **Note:** Capacity Manager agent components are automatically installed on the management server when the Capacity Manager server components are installed. It is not necessary or possible to separately install Capacity Manager agent components on a management server.

Installing Capacity Manager on a Windows server

This topic describes installation procedures for Capacity Manager on a Windows management server.

Complete the following steps to install Capacity Manager on a Windows management server:

1. Close all applications, including any command-prompt windows.
2. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.
3. Click **Start → Run**.
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   `d:\capmgt\server\windows\i386\setup.exe`

   d represents the drive letter of the CD-ROM drive.
5. In the first panel of the IBM Director Capacity Manager Server Tool InstallShield Wizard, click **Next**.
6. In the second panel of the IBM Director Capacity Manager Server Tool InstallShield Wizard, select **I accept the terms in the license agreement**, and click **Next**.
7. In the third panel of the IBM Director Capacity Manager Server Tool InstallShield Wizard, click **Install**. A new panel displays the installation progress.
8. When installation has completed, click **Finish**.
9. Remove the CD from the CD-ROM drive.

The installation process automatically stops and restarts the management server. The IBM Director Capacity Manager Server Tool InstallShield Wizard installs the server, console, and agent components of Capacity Manager on the management server.

After installing the server, console, and agent components of Capacity Manager on the management server, you need to install the console components on any other management consoles, and the agent components on managed systems.

Installing Capacity Manager on a Linux server

This topic describes installation procedures for Capacity Manager on a Linux management server.

Complete the following steps to install Capacity Manager on a Linux management server:

1. Stop IBM Director Agent. From a command prompt, type the following command and press **Enter**:

   `/opt/ibm/director/bin/twgstop`
2. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.
3. If the CD does not automount, mount the CD-ROM drive. Type the following command and press **Enter**:

   `mount /dev/cdrom /mnt/cdrom`

   For this command and others in this topic, *mnt/cdrom* is the mount point of the CD-ROM drive and *dev/cdrom* is the specific device file for the CD-ROM block device.
4. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   `cd /mnt/cdrom/capmgt/server/linux/i386/`

5. Type one of the following commands and press **Enter**:

Installation scenario	Command
Performing a new installation	`rpm -ivhCapMgtServer-5.10-1.i386.rpm`

Upgrading from a previous version	`rpm -Uvh --relocate`
	`/opt/ibm/director=/opt/IBM/director`
	`CapMgtServer-5.10-1.i386.rpm`

The installation progress is displayed.

6. Restart IBM Director Agent. From a command prompt, type the following command and press **Enter**:

   `/opt/ibm/director/bin/twgstart`

7. Unmount the CD-ROM drive. Perform the following steps to unmount the CD-ROM drive:

   a. Type `cd /` and press **Enter**.

   b. Type the following command and press **Enter**:

      `umount /mnt/cdrom`

8. Remove the CD from the CD-ROM drive.

The IBM Director Capacity Manager Server installation process installs the server, console, and agent components of Capacity Manager on the management server.

After installing the server, console, and agent components of Capacity Manager on the management server, you need to install the console components on any other management consoles, and the agent components on managed systems.

Installing Capacity Manager on a Windows console

This topic describes installation procedures for Capacity Manager on a Windows management console.

Capacity Manager server components should be installed on the management server before installing the console components of Capacity Manager.

Complete the following steps to install Capacity Manager on a Windows management console:

1. Close IBM Director Console.

2. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.

3. Click **Start → Run**.

4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   `d:\capmgt\console\windows\i386\setup.exe`

   d represents the drive letter of the CD-ROM drive.

5. In the first panel of the IBM Director Capacity Manager Console Tool InstallShield Wizard, click **Next**.

6. In the second panel of the IBM Director Capacity Manager Console Tool InstallShield Wizard, select **I accept the terms in the license agreement**, and then click **Next**.

7. In the third panel of the IBM Director Capacity Manager Console Tool InstallShield Wizard, click **Install**. A new panel displays the installation progress.

8. When installation has completed, click **Finish**.

9. Remove the CD from the CD-ROM drive.

10. Restart IBM Director Console.

After installing the console components of Capacity Manager, you need to install the Capacity Manager agent components on your managed systems.

Installing Capacity Manager on a Linux console

This topic describes installation procedures for Capacity Manager on a Linux management console.

Capacity Manager server components should be installed on the management server before installing the console components of Capacity Manager.

Note: Capacity Manager user-interface components for IBM Director Console are automatically installed on the management server when the Capacity Manager server components are installed. It is not necessary or possible to separately install Capacity Manager console components on a management server.

Complete the following steps to install Capacity Manager on a remote Linux console:

1. Close IBM Director Console.

2. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.

3. If the CD does not automount, mount the CD-ROM drive. Type the following command and press **Enter**:

   ```
   mount /dev/cdrom /mnt/cdrom
   ```

   For this command and others in this topic, *mnt/cdrom* is the mount point of the CD-ROM drive and *dev/cdrom* is the specific device file for the CD-ROM block device.

4. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /mnt/cdrom/capmgt/console/linux/i386/
   ```

5. Type one of the following commands and press **Enter**:

Installation scenario	Command
Performing a new installation	`rpm -ivh CapMgtConsole-5.10-1.i386.rpm`
Upgrading from a previous version	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director CapMgtConsole-5.10-1.i386.rpm`

   The installation progress is displayed.

6. Unmount the CD-ROM drive. Perform the following steps to unmount the CD-ROM drive:

   a. Type `cd /` and press **Enter**.

   b. Type the following command and press **Enter**:

   ```
   umount /mnt/cdrom
   ```

7. Remove the CD from the CD-ROM drive.

8. Restart IBM Director Console.

After installing the console components of Capacity Manager, you need to install the Capacity Manager agent components on your managed systems.

Installing Capacity Manager on a managed Windows system

This topic describes installation procedures for Capacity Manager on a Windows managed system.

Capacity Manager should be installed on the management server and management console before installing the agent components of Capacity Manager on managed systems.

Note: An alternative installation method is to use Update Assistant and Software Distribution. For more information, refer to the ″Creating software packages to distribute″ section of the *IBM Director Systems Management Guide*.

Complete the following steps to install Capacity Manager on a Windows managed system:

1. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.

2. Click **Start → Run**.

3. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   d:\capmgt\agent\windows\i386\setup.exe

   d represents the drive letter of the CD-ROM drive.

4. In the first panel of the IBM Director Capacity Manager Console Tool InstallShield Wizard, click **Next**.

5. In the second panel of the IBM Director Capacity Manager Console Tool InstallShield Wizard, select **I accept the terms in the license agreement**, and then click **Next**.

6. In the third panel of the IBM Director Capacity Manager Agent Tool InstallShield Wizard, click **Install**. A new panel displays the installation progress.

7. When installation has completed, click **Finish**.

8. Remove the CD from the CD-ROM drive.

Although you may manually stop and restart IBM Director Agent on the managed system, it is not necessary to do so for this installation. The listener is stopped automatically during installation and restarted when installation is complete.

Installing Capacity Manager on a managed 32-bit Linux system

This topic describes installation procedures for Capacity Manager on a 32-bit Linux managed system.

Capacity Manager should be installed on the management server and management console before installing the agent components of Capacity Manager on managed systems.

Notes:

1. Capacity Manager agent components are automatically installed on the management server when the Capacity Manager server components are installed. It is not necessary or possible to separately install Capacity Manager agent components on a management server.

2. An alternative installation method is to use Update Assistant and Software Distribution. For more information, refer to the "Creating software packages to distribute" section of the *IBM Director Systems Management Guide*.

Complete the following steps to install Capacity Manager on a 32-bit Linux managed system:

1. Insert the *IBM Director 5.10 Capacity Manager* CD into the CD-ROM drive.

2. If the CD does not automount, mount the CD-ROM drive. Type the following command and press **Enter**:

   ```
   mount /dev/cdrom /mnt/cdrom
   ```

   For this command and others in this topic, *mnt/cdrom* is the mount point of the CD-ROM drive and *dev/cdrom* is the specific device file for the CD-ROM block device.

3. Stop IBM Director Agent. From a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstop
   ```

4. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /mnt/cdrom/capmgt/agent/linux/i386/
   ```

5. Type one of the following commands and press **Enter**:

Installation scenario	Command
Performing a new installation	`rpm -ivhCapMgtAgent-5.10-1.i386.rpm`
Upgrading from a previous version	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director CapMgtAgent-5.10-1.i386.rpm`

   The installation progress is displayed.

6. Restart IBM Director Agent. From a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstart
   ```

7. Unmount the CD-ROM drive. Perform the following steps to unmount the CD-ROM drive:

   a. Type `cd /` and press **Enter**.

   b. Type the following command and press **Enter**:

   ```
   umount /mnt/cdrom
   ```

8. Remove the CD from the CD-ROM drive.

Chapter 3. Monitoring performance

Use the Capacity Manager task to monitor performance across your systems. You can generate reports and graphs for performance data.

Activating a performance monitor

This task describes how to activate a performance monitor.

Tip: You cannot select a group of monitors by clicking the group name. You must select each monitor individually. If you have deactivated a monitor, it will not be reactivated until you reactivate it.

Complete these steps to activate a monitor:
1. In the IBM Director Console Tasks pane, expand the **Capacity Manager** task.
2. Drag the **Monitor Activator** subtask onto a managed system or group on which the Capacity Manager Agent is installed.
3. In the left pane of the Monitor Activator window, click the monitor that you want to activate.
4. Click **On**.
5. Click **Apply**.

Changing performance-analysis report settings

This task describes how to change the performance-analysis settings.

Complete these steps to change the performance-analysis report settings:
1. In the Report Viewer window, click **Edit icon ( )** → **Settings**.
2. In the Settings window, click the **Graph** tab to configure the appearance of the graph in the Graph pane.
3. Click the **Window** tab to configure the appearance of the viewer.
4. Click the **Monitors** tab to configure the threshold settings for each monitor.
5. Click **Apply**.
6. Click **OK**.

Changing the graph display settings

This task describes how to configure the graph display settings in the Report Viewer window.

Complete these steps to configure display options for the graphs in a report:
1. In the Report Viewer window, click the **Graph** tab.
2. Type the maximum number of systems to display on the graph before combining results into a trend in the **Trend graph** field.
3. Type the dimensions of the grid size in the **Maximum grid size** fields.
4. Select the appropriate graph options from the **Graph options** box, including those for displaying maximum and minimum lines for averaged values, displaying the legend on the screen, and setting the thickness of threshold lines.
5. If you decide to return to the default settings, click **Return to defaults**.

Changing the monitor display settings

This task describes how to configure the monitor display settings in the Report Viewer window.

Complete these steps to configure monitor settings in a report:

1. From the Report Viewer window, click the **Monitors** tab.
2. On the Monitors page, click a monitor in the left pane to select it.
3. **Optional:** You can adjust the threshold settings on performance-analysis monitors to conduct resource planning to discover whether a bottleneck appears when capacity is set to a given value. However, changing the default settings will impair the performance-analysis function. If you want to adjust the threshold settings, type custom values for the warning threshold and critical threshold settings in the **Threshold settings** fields.
4. Select the **Show thresholds as a percent of maximum value** check box to display thresholds as a percentage of the maximum value on the report.
5. Select the **Adjust range to peak value** check box to set the peak value that is reported as the vertical range value of the graph.
6. If you decide to return to the default settings, click **Return to defaults**.

Changing the report window display settings

This task describes how to configure the window display settings in the Report Viewer window.

Complete these steps to configure the window display settings for the Report Viewer window:

1. In the Report Viewer window, click the **Windows** tab.
2. Decide whether to abbreviate column headings. If you choose to abbreviate column headings, type the maximum number of characters in the field.
3. Select **Small icons** or **Large icons**.
4. If you decide to return to the default settings, click **Return to defaults**.

Creating an event filter for bottlenecks

This task describes how to create an event filter for bottlenecks.

Complete the following steps to create an event filter specifically for bottlenecks:

1. In IBM Director Console, click **Tasks → Event Action Plan Builder**.
2. In the Event Action Plan Builder window, click **File → New → Simple Event Filter**.
3. In the left pane of the Event Type page in the Simple Event Filter Builder window, clear the **Any** check box.
4. In the right pane, expand **Capacity Manager**.
5. Expand **Bottleneck**.
6. Click **Recommendation**.
7. Click the **Extended Attributes** tab.
8. Clear the **Any** check box.
9. In the **Keywords** list, click **Hours since bottleneck first started**.
10. In the **Operator** list, click **Equal to**.
11. In the **Values** field, type **2**.

12. Click **File** → **Save As**.
13. In the Save Event Filter window, type the name of the filter.
14. Click **OK** to save the filter. The new filter is displayed in the Event Filters pane under **Simple Event Filter**.

Creating a performance-analysis report

This task describes how to create a performance-analysis report using a predefined or customized report definition.

To create a report using a predefined or customized report definition:
1. In the IBM Director Console Tasks pane, expand **Capacity Manager**.
2. Expand **Report Generator**.
3. Drag the report definition that you want to use onto one or more managed systems or group. A status window opens to indicate the progress. If the report definition specifies that the report is sent to the report viewer, the Report Viewer window opens. If the report definition specifies that the report is sent to a file, the report is saved automatically. Unless you specify a directory in the report definition, the file is saved to the default directory, IBM\Director\reports..
4. If you selected a report definition that is saved to a file, specify one of these options:
   - Click **Execute Now** to generate the report now. A status window opens to indicate progress. The report is saved to the directory specified in the report definition or to the default directory, \IBM\Director\reports.
   - Click **Schedule** to set a time to generate the report.

If the report definition specifies that the report is to be displayed in the report viewer, the Report Viewer window opens.

Creating a performance-analysis report definition

After you create a customized report definition, you can generate a performance-analysis report that includes only those parameters that you have specified.

Complete these steps to create a new performance-analysis report definition:
1. Run the **Monitor Activator** subtask on a managed system or group to activate the monitors for that system or group.
2. Expand **Report Generator**
3. Double-click **New Report Definition**.
4. In the Report Definitions window, specify the report parameters:
   a. Click the **Report Parameters** tab.
   b. Select the report duration, the global sampling frequency, and whether to collect minimum and maximum values.

   Note: Selecting the **Collect min and max values** check box specifies that the minimum and maximum data points for each sample are collected. An advantage of collecting the minimum and maximum data points is that you can use a slower sampling frequency, which collects data less frequently; using this option reduces the size of the report while still providing informative managed-system performance data. If

memory usage is an issue, consider using a slower sampling frequency. Note that the average is always collected.

   c. Select number of minutes Capacity Manager waits for a system to respond before considering the system unable to provide the data from the **Timeout per system** drop-down list.

   d. Click **New**. In the New Time Interval window, specify the time of the report.

5. Specify the methods you want to use to generate the report:

   a. Click the **Method of Generating a Report** tab.

   b. Select **Generate to Viewer** or **Generate to File**.

   c. Select the appropriate file-format check boxes to generate the file in the selected formats. The default file format is XML.

   d. If you selected **Generate to SQL**, type the database Web address and root table name in the applicable fields.

      Note: The ability to generate a report in SQL format is available on a Window platform only.

   e. If you use SQL authentication, type the user ID and password for the SQL connection in the applicable fields.

   f. Select **Generate Bottleneck events** to generate an event in the IBM Director event log.

   g. Select **Back up existing files** to archive saved reports.

   h. Select **Number of backups** to set the number of reports to keep.

   i. Select **Set destination directory** to set the destination directory.

      Note: The default destination directory is IBM\Director\reports.

6. Specify the monitor selection:

   a. Click the **Monitor Selection** tab.

   b. On the Monitor Selection page, click **Include all activated monitors** to include all active monitors in the report, or click **Select individual monitors** to select specific monitors.

   c. If you chose to set individual monitors:

     1) Click the appropriate monitors in the **Monitors** list.

     2) Click **Include** or **Exclude** to include or exclude the selected monitors.

   d. Select the **Override global settings** check box to use a different sampling frequency than the default.

7. Specify the thresholds:

   a. Click the **Threshold Settings** tab.

      Note: A threshold setting applies to all managed systems included in the report definition.

   b. In the **Critical threshold** field, type the value of the critical threshold.

   c. In the **Warning threshold** field, type the value of the warning threshold.

   d. Click **Return to defaults** to set the threshold values to default values.

   e. Click **Save As**.

   f. In the Save As window, type the name of the report definition and click **OK**.

Deactivating a performance monitor

This task describes how to deactivate a performance monitor.

Note: You cannot select a group of monitors by clicking the group name. You must select each monitor individually. If you have deactivated a monitor, it will not be reactivated until you reactivate it.

Complete these steps to deactivate a performance monitor:
1. In the IBM Director Console Tasks pane, expand the **Capacity Manager** task.
2. Drag the **Monitor Activator** subtask onto a managed system or group on which the Capacity Manager Agent is installed.
3. In the left pane of the Monitor Activator window, click the monitor that you want to deactivate.
4. Click **Off**.
5. Click **Apply** to close the Monitor Activator window.

Identifying bottlenecks

This task describes how to identify bottlenecks in a managed system or group.

Use one of the following methods to identify bottlenecks in a managed system or group:
- Schedule performance analysis to check for bottlenecks and generate an event when a threshold is exceeded or met.
- Use the Report Generator function to generate a report immediately.

If a bottleneck is found, the monitor name is shown in bold and in red in the performance-analysis section of the report, and recommendations for correcting the bottleneck are made. If no bottleneck is found, the performance-analysis icon indicates that no bottlenecks were found.

Printing a performance-analysis report

This task describes how to print a performance-analysis summary and graph.

Perform one of the following procedures to print either a performance-analysis summary or a graph:
- To print a performance-analysis summary, in the Report Viewer window, click the **File icon (** **) → Print → Performance analysis report**
- To print a performance-analysis graph, in the Report Viewer window, click the **File icon (** **) → Print → Graph Print**

Saving a performance-analysis report

This task describes how to save a performance-analysis summary and graph.

You can save a performance-analysis report summary in HTML format for later viewing and printing from a Web browser. The report in HTML format includes the monitor and managed-system parameter information from the Table view in Report Viewer window.

You can also save a performance-analysis graph in a GIF file. This report includes the managed-systems information from the Graph pane in the Report Viewer window.

- Complete these steps to save a performance-analysis summary on the management console as an HTML file:
    1. Click **File icon (⊟)** → **Export report to local HTML**.
    2. Type a new file name.
    3. In the Export Report to Local HTML window, click **Save**.
- Complete these steps to save a performance-analysis summary on the management server as an HTML file:
    1. Click **File icon (⊟)** → **Export report to remote HTML**.
    2. Type a new file name.
    3. In the Export Report to Remote HTML window, click **Save**.
- Complete these steps to save a performance-analysis graph on the management console as an HTML file:
    1. Click **File icon (⊟)** → **Export graph to local HTML**.
    2. Type a new file name.
    3. In the Export Graph to Local HTML window, click **Save**.
- Complete these steps to export a performance-analysis graph on the management server as a GIF file:
    1. Click **File icon (⊟)** → **Export graph to remote GIF** .
    2. Type a new file name.
    3. In the Export Graph to Remote GIF window, click **Save**.

Scheduling to check for bottlenecks

You can set up a schedule to have IBM Director check for bottlenecks on a regular basis. When a bottleneck is detected, an event is added to the event log, and IBM Director generates a report.

You must select the **Generate bottleneck events** check box for the report definition that you are using. Otherwise, an event action plan cannot notify you that a bottleneck has occurred, because event action plans depend on events to trigger event actions.

Complete these steps to schedule regular checks for bottlenecks:
1. In the IBM Director Console Tasks pane, expand the **Capacity Manager** task.
2. Expand the **Report Generator** subtask. Drag **Hourly Bottleneck Events** onto the managed system or systems or group that you want to monitor for bottlenecks.
3. Click **Schedule**.
4. In the New Scheduled Job window, type a job name.
5. Select the date and time for the initial check.
6. Click **Advanced** to schedule the job to repeat at regular intervals.
7. On the **Date/Time** page of the New Scheduled Job window, select the **Repeat** check box.
8. In the **Repeats** group box of the Repeat window, select how often you want to check for performance bottlenecks.
9. Click **OK**.

10. Click **File** → **Save As**.

11. In the Save Job window, type a descriptive name for the scheduled job. Click **OK**. A confirmation message is displayed, indicating that you have saved the job.

12. Click **OK** to close the message window.

Setting up automatic notification of bottlenecks

This task describes how to sets up automatic notification when bottlenecks occur.

Capacity Manager can determine where and when bottlenecks occur. Complete these steps to set up automatic notification when a bottleneck occurs:

1. Set up a schedule to periodically check for performance bottlenecks and to generate an event when a performance threshold is met or exceeded, indicating a bottleneck.

2. Create an event filter to notify you of the event.

3. Create an event action plan that uses the event filter.

4. Apply the event action plan to the managed systems or groups that you want to monitor.

Viewing a performance forecast graph

This task describes how to view a performance forecast graph.

To view the forecast graph for a selected managed system, go to the Report Viewer window. Click the Forecast icon ( ) in the lower-right corner of the lower-right pane. Capacity Manager displays the forecast graph for the selected monitor.

Notes:

1. You cannot use the Zoom tool and the Forecast tool at the same time.

2. The forecast data is more meaningful for managed systems that are individually graphed rather than shown in a trend graph. To change from a trend graph to a graph of individual managed systems, either set your trend graph threshold to a higher number or select fewer managed systems to graph at one time.

Viewing previously generated reports

This task describes how to view reports that were previously generated.

Note: If you use the Report Viewer to display a report that was saved in XML format, you can adjust the threshold settings on performance-analysis monitors.

Complete these steps to view a previously generated report:

- To view a report that has been saved to the management server:
  1. In the IBM Director Console Tasks pane, expand **Capacity Manager**.
  2. Right-click **Report Viewer**.
  3. Click **Open**.
  4. In the Open Remote Report window, select a file.
  5. Click **Open**.
- To view a report that has been saved to the management console:

1. In the IBM Director Console Tasks pane, expand **Capacity Manager**.
2. Right-click **Report Viewer**.
3. Click **File icon ( )** → **Open local report**.
4. In the Open Local Report window, select a file.
5. Click **Open**.

Viewing performance statistics

This task describes how to view a performance statistics for active performance monitors.

In the IBM Director Console Tasks pane, expand the **Capacity Manager** task. Drag the **Monitor Activator** subtask onto a managed system or group on which the Capacity Manager Agent is installed.

In the left pane, all monitors are displayed in a tree structure; each monitor has an icon to indicate its status. The names of performance-analysis monitors are displayed in bold.

In the Systems pane, an icon is displayed beside each managed system or group to indicate its status. In the Legend pane, the monitor and managed-system icons and their descriptions are displayed.

Appendix A. Capacity Manager events

The Capacity Manager events occur when Capacity Manager identifies a managed system that has a system capacity bottleneck. For the Capacity Manager Agent to generate these events, you must select the **Generate Bottleneck Events** check box when creating a Capacity Manager report definition.

Event source

These event types are generated by the Capacity Manager Agent that is installed on a Level-2 managed system. A prerequisite for the Capacity Manager Agent is IBM Director Agent.

Details

If you select the **Capacity Manager** check box in the Event Filter Builder tree, the event filter will process all of the event types that are specified in the Capacity Manager subtree.

Event type	Event text	Severity	Category	Extended attributes
Capacity Manager	Not applicable	Not applicable	Not applicable	None

You can choose to select specific event types that are displayed under the Capacity Manager node in the Event Filter Builder tree. The event filter will process only the event types that you select.

Event type	Event text	Severity	Category	Extended attributes
Bottleneck	A system bottleneck has been detected.	Critical	Alert	• *CMR file* indicates that the Capacity Manager report is generated in the CMR format. • *CMS file* indicates that the Capacity Manager report is generated in the CMS format. • *Cluster node* indicates that a Capacity Manager report is generated about the Level-2 managed systems that are in a Microsoft cluster.

Event type	Event text	Severity	Category	Extended attributes
Bottleneck (continued)				*Days until bottleneck starts* indicates the number of days until the predicted bottleneck will start. *HTML file* indicates that the Capacity Manager report is generated in the HTML format. *Hours until bottleneck starts* indicates the number of hours until the predicted bottleneck will start. *Involves CPUs* indicates that the predicted bottleneck involves the system microprocessor. *Involves Disks* indicates that the predicted bottleneck involves the system hard disk drives. *Involves LAN Adapters* indicates that the predicted bottleneck involves the system LAN adapter. *Involves Memory* indicates that the predicted bottleneck involves the system memory. *Minutes until bottleneck starts* indicates the number of minutes until the predicted bottleneck will start. *TXT file* indicates that the Capacity Manager report is generated in the ASCII text format. *XML file* indicates that the Capacity Manager report is generated in the XML format.
Bottleneck > Recommendation	An event-enabled Capacity Manager report has been run and a system bottleneck was detected during performance analysis.	Critical	Alert	*CMR file* indicates that the Capacity Manager report is generated in the CMR format. *CMS file* indicates that the Capacity Manager report is generated in the CMS format. *Cluster node* indicates that a Capacity Manager report is generated about the Level-2 managed systems that are in a Microsoft cluster.

Event type	Event text	Severity	Category	Extended attributes
Bottleneck > Recommendation (continued)				• *Days since bottleneck first started* indicates the number of days since the bottleneck started. • *Days since bottleneck last stopped* indicates the number of days since the bottleneck stopped. • *Days until bottleneck starts* indicates the number of days until the predicted bottleneck will start. • *HTML file* indicates that the Capacity Manager report is generated in the HTML format. • *Hours in this bottleneck* indicates the number of hours in this bottleneck occurrence. • *Hours since bottleneck first started* indicates the number of hours since the bottleneck started. • *Hours since bottleneck last stopped* indicates the number of hours since the bottleneck stopped. • *Hours until bottleneck starts* indicates the number of hours until the predicted bottleneck will start. • *Involves CPUs* indicates that the predicted bottleneck involves the system microprocessor. • *Involves Disks* indicates that the predicted bottleneck involves the system hard disk drives. • *Involves LAN Adapters* indicates that the predicted bottleneck involves the system LAN adapter. • *Involves Memory* indicates that the predicted bottleneck involves the system memory. • *Minutes since bottleneck first started* indicates the number of minutes since the bottleneck started. • *Minutes since bottleneck last stopped* indicates the number of minutes since the bottleneck stopped. • *Minutes until bottleneck starts* indicates the number of minutes until the predicted bottleneck will start.

Event type	Event text	Severity	Category	Extended attributes
Bottleneck > Recommendation (continued)				• *TXT file* indicates that the Capacity Manager report is generated in the ASCII text format. • *When bottleneck first started* indicates the time when the bottleneck started. • *When bottleneck last stopped* indicates the time when the bottleneck stopped. • *XML file* indicates that the Capacity Manager report is generated in the XML format.
No Response	Not applicable	Minor	Alert	None
No Response > No Monitors	No systems responded with monitor data when an event-enabled report was run.	Minor	Alert	None

Appendix B. Capacity Manager windows

Monitor Activator window

This topic describes the Monitor Activator window in IBM Director.

Introduction

The Monitor Activator windows shows which resource monitors are currently active on a managed system or group. It also allows you to activate and deactivate monitors on a managed system.

Fields

Tree structure
> All monitors displayed in a tree structure. Each monitor has an icon to indicate its status. The names of performance-analysis monitors are displayed in bold.
>
> > **On** Activates the selected monitor.
> >
> > **Off** Deactivates the selected monitor. The monitor is not reactivated until you reactivate it.

Systems
> Displays the status of each managed system for the selected monitors. An icon beside each managed system or group indicates its status.

Legend
> Displays the monitor and managed-system icons and their descriptions.

Report Definitions window

This topic describes the Report Definitions window in IBM Director.

Introduction

Use report definition to decide what data to collect and how often, when to generate the report, how the report will be named and saved, and whether to view it now or later. Capacity Manager provides five standard report definitions: Hourly, Daily, Weekly, Monthly, and Hourly Bottleneck Events.

Report Definition window: Report Parameters page

This topic describes the Report Definition window: Report Parameters page in IBM Director.

Fields

Use the Report Definition window to set the following parameters for all of your monitors.

Report Duration
> The length of time covered by the report. A standard report definition will already have this set. For example, the Weekly report definition will have

this set to 1 week. If you are creating a new report definition, the possible report durations are 3 hours, 8 hours, 1 day, 1 week, and 1 month.

Global Sampling Frequency
Selects how often sampling occurs for all of the selected monitors. Sampling frequency values are 1 minute, 5 minutes, 30 minutes, and 1 hour.

Collect min and max values
The minimum and maximum data values for the collection.

Timeout per System
Selects how long Capacity Manager waits for each of your selected systems to respond. Values for this field can be 1 - 9 minutes.

Days Selects the days of the week collection occurs.

Times Selects the new data-collection time interval. This field also edits an existing one-time interval or deletes a time interval.

Report Definitions window: Method of Generating Report page

This topic describes the Report Definitions window: Method of Generating Report page in IBM Director.

Fields

Append time stamp to file name
When checked, creates a unique file name by adding a time stamp to the file name.

Generate to Viewer
Generates a report to the Report Viewer for immediate viewing.

Generate to File
Saves the report to a directory. The file can be saved in the following file types:
- .cmr
- .txt
- .html
- .xml
- .cms (Generate to SQL option)

Generate to SQL
The file is saved to a new SQL table or appended to an existing SQL table.

Append
When checked, the report is appended to an existing SQL table.

Database URL
Specifies the database to connect to.

Root table name
Specifies the name of the table to write to.

User ID
Specifies the user ID for access to the database.

Password
Specifies the password associated with the password.

Backup up existing files
When selected, renames any existing reports with a dot and number. For example Hourly Report.cmr becomes Hourly Report.cmr.1,

Number of backups
Limits the number of backups to the selected number. Backups earlier than this number are deleted.

Set destination directory
Saves all selected file types to the selected destination directory on the IBM Director Server.

Generate Bottleneck events
Writes the files only when bottlenecks occur.

Report Definitions window: Monitor Selection page

This topic describes the Report Definitions window: Monitor Selection page in IBM Director.

Fields

Include all active monitors
Specifies that all the monitors activated in the **Monitor Activator** window have the global sampling frequency that is set in the **Report Parameters** window

Include all individual monitors
Specifies which monitors to include in the report among those that are activated in the **Monitor Activator** window.

Monitors
The list of monitors to specify.

Tree When checked, displays a tree view of the monitors.

Include button
The selected monitor is included in the report.

Exclude button
The selected monitor is excluded from the report.

Global settings
The current global settings for all of the monitors.

Override global settings
When checked, the global settings do apply to the selected monitor.

Sampling frequency
The sampling frequency for the selected monitor. Sampling frequency values are 1 minute, 5 minutes, 30 minutes, and 1 hour.

Collect Min and Max values
The collection minimum and maximum data values for the selected monitor.

Report Definitions window: Threshold settings page

This topic describes the Report Definitions window: Threshold settings page in IBM Director.

Fields

Monitors
> The monitor for which to set the values specified in the **Threshold settings** field.

Threshold settings
> Sets the **Critical threshold** and **Warning thresholds** for a selected monitor. The thresholds are a percentage of the actual value of the monitor when set on a Report Definition.

Report Viewer window

This topic describes the Report Viewer window in IBM Director.

Toolbars

File menu >
> Use the **File menu** to work with report files.

> **Open local report**
> > Opens a report file located on your workstation.

> **Merge with local report**
> > Combines one or more report files that are stored on your workstation with the report file that is currently open in the Report Viewer.

> **Save as local report**
> > Saves the report on your workstation.

> **Export report to local HTML**
> > Saves the report as an .html file on your workstation.

> **Export graph to local GIF**
> > Saves the graph that is currently shown in the Report Viewer as a .gif file on your workstation.

> **Open remote report**
> > Opens a report that is saved on the IBM Director server.

> **Merge with remote report**
> > Combines one or more report files that are stored on the IBM Director server with the report file that is currently open in the Report Viewer.

> **Save as remote report**
> > Saves the report on the IBM Director server.

> **Export report to remote HTML**
> > Saves the report as an .html file on the IBM Director server.

> **Export graph to remote GIF**
> > Saves the graph that is currently shown in the Report Viewer as a .gif file on the IBM Director server

> **Print >**
> > Prints the graph or performance analysis report.

> > **Graph Print**
> > > Prints graph information from the Report Viewer.

> > **Performance Analysis Report**
> > > Prints the Performance Analysis report.

New Window
        Opens the Report Viewer in a new window.

Exit   Closes the Report Viewer.

Edit menu >
        Use the **Edit** menu to changes settings, select all systems, or use the
        Enable Performance Analysis option.

        Select all systems
                Selects all systems listed in the system pane of the Report Viewer

        Settings
                Changes the appearance of the Report Viewer.

Table view of systems
        Displays the view of systems or groupings in a table.

Icon view of systems
        Displays all of the systems or groupings as icons on one panel.

Hypergraph view of systems
        Displays the average data values of the selected monitor for all the systems
        or clusters and groups in your report.

Performance analysis view of systems
        Probes for bottlenecks in server hardware performance, diagnoses the
        problem, and suggests ways to improve performance.

System mode
        Displays systems individually, regardless of whether they belong to a
        cluster or group

Group mode
        Displays systems that are grouped together either because they belong to a
        particular cluster or because they belonged to an IBM Director group.

Sort by
        Allows you to select a field in the **System pane** to sort in ascending or
        descending order.

Fields

System pane
        Displays the systems in your report. It has four views to help you evaluate
        your systems' performance.

Monitor pane
        Displays the list of monitors in your report in one of two views: the flat
        plane view or the tree view.

Graph pane
        Displays a graph of the systems selected in the **System** pane and the
        monitor selected in the **Monitor** pane.

Appendix C. Operating systems supported by Capacity Manager

This topic provides information about the operating systems supported by the Capacity Manager task.

Management-server support

This task is supported by IBM Director Server when installed on servers running the following operating systems:

- Linux on xSeries
- Windows

Managed-object support

The following tables list the operating systems that this task supports for managed objects. Managed objects can include IBM xSeries, iSeries™, System p5 and pSeries, and System z9 and zSeries hardware. Managed systems are a subset of managed objects that use different levels of IBM Director support. This task can be used on Level-2 managed systems only. These managed systems must be xSeries and Netfinity servers.

Table 1. Operating systems supported by xSeries servers

Operating system	Level 2
Editions of Windows for 32-bit systems:	
• Windows 2000, Advanced Server, Datacenter, Professional, and Server Editions • Windows XP Professional Edition • Windows Server 2003, Datacenter, Enterprise, Standard, and Web Editions	Yes
Editions of Windows for 64-bit systems:	
• Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions • Windows XP Professional x64 Edition • Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No
Versions of Linux for 32-bit systems:	
• Red Hat Enterprise Linux AS, ES, and WS, version 3.0 • Red Hat Enterprise Linux AS, ES, and WS, version 4.0 • SUSE LINUX Enterprise Server 8 for x86 • SUSE LINUX Enterprise Server 9 for x86 • VMware ESX Server, versions 2.1, 2.5, and 2.51, Console • VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems • VMware GSX Server, versions 3.1 and 3.2, Console • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	Yes
Versions of Linux for 64-bit systems:	

Table 1. Operating systems supported by xSeries servers (continued)

Operating system	Level 2
• Red Hat Enterprise Linux AS, ES, and WS, version 3.0, for AMD64 and EM64T • Red Hat Enterprise Linux AS, ES, and WS, version 4.0, for AMD64 and EM64T • Red Hat Enterprise Linux AS, version 3.0, for Intel Itanium • Red Hat Enterprise Linux AS, version 4.0, for Intel Itanium • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 8 for Itanium Processor Family • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 2. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 2
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • i5/OS, Version 5 Release 3 • Red Hat Enterprise Linux AS, version 3.0, for IBM POWER **Note:** System p5 and pSeries servers require Red Hat Enterprise Linux AS, version 3.3 or later, for IBM POWER • Red Hat Enterprise Linux AS, version 4.0, for IBM POWER • SUSE LINUX Enterprise Server 8 for IBM POWER • SUSE LINUX Enterprise Server 9 for IBM POWER	No

Table 3. Operating systems supported by System z9 and zSeries servers

Operating system	Level 2
• Red Hat Enterprise Linux AS, version 4.0, for IBM System z9, zSeries and S/390 • SUSE LINUX Enterprise Server 9 for IBM System z9, zSeries and S/390	No

Appendix D. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106-0032, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
MW9A/050
5600 Cottle Road
San Jose, CA 95193
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

AIX
AIX 5L
Alert on LAN
Asset ID

BladeCenter
DB2
DB2 Universal Database
DirMaint
Electronic Service Agent
Enterprise Storage Server
eServer
eServer logo
FlashCopy
HiperSockets
i5/OS
IBM
IBM logo
ibm.com
IntelliStation
iSeries
Netfinity
NetServer
NetView
OS/400
POWER
Predictive Failure Analysis
pSeries
RACF
Redbooks
ServeProven
SurePOS
System p5
System z9
Tivoli
Tivoli Enterprise
Tivoli Enterprise Console
Virtualization Engine
Wake on LAN
xSeries
z/VM
zSeries

Intel and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

Red Hat and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.

Abbreviations, Acronyms, and Glossary

Abbreviation and acronym list

This topic lists abbreviations and acronyms used in the IBM Director documentation.

Table 4. Abbreviations and acronyms used in IBM Director documentation

Abbreviation or acronym	Definition
AES	advanced encryption standard
APAR	authorized program analysis report
ASF	Alert Standard Format
ASM	Advanced System Management
ASM PCI Adapter	Advanced System Management PCI Adapter
BIOS	basic input/output system
CEC	Central Electronics Complex
CIM	Common Information Model
CIMOM	Common Information Model Object Manager
CP	control program
CRC	cyclic redundancy check
CSM	IBM Cluster Systems Management
CSV	comma-separated value
DASD	direct access storage device
DBCS	double-byte character set
DES	data encryption standard
DHCP	Dynamic Host Configuration Protocol
DIMM	dual inline memory module
DMI	Desktop Management Interface
DMTF	Distributed Management Task Force
DNS	Domain Name System
DSA	Digital Signature Algorithm
EEPROM	electrically erasable programmable read-only memory
FRU	field-replaceable unit

Table 4. Abbreviations and acronyms used in IBM Director documentation (continued)

Abbreviation or acronym	Definition
FTMI	fault tolerant management interface
FTP	file transfer protocol
GB	gigabyte
Gb	gigabit
GMT	Greenwich Mean Time
GUI	graphical user interface
GUID	globally unique identifier
HMC	Hardware Management Console
HTML	hypertext markup language
IIS	Microsoft Internet Information Server
I/O	input/output
IP	Internet protocol
IPC	interprocess communication
IPMI	Intelligent Platform Management Interface
IPX	internetwork packet exchange
ISDN	integrated services digital network
ISMP	integrated system management processor
JVM	Java™ Virtual Machine
JCE	Java Cryptography Extension
JDBC	Java Database Connectivity
JFC	Java Foundation Classes
JRE	Java Runtime Environment
KB	kilobyte
Kb	kilobit
kpbs	kilobits per second
KVM	keyboard/video/mouse
LAN	local area network
LED	light-emitting diode
LPAR	logical partition
MAC	media access control

Abbreviation or acronym	Definition
MB	megabyte
Mb	megabit
Mbps	megabits per second
MD5	message digest 5
MDAC	Microsoft Data Access Control
MHz	megahertz
MIB	Management Information Base
MIF	Management Information Format
MMC	Microsoft Management Console
MPA	Management Processor Assistant
MPCLI	Management Processor Command-Line Interface
MSCS	Microsoft Cluster Server
MST	Microsoft software transformation
NIC	network interface card
NNTP	Network News Transfer Protocol
NTP	network time protocol
NVRAM	nonvolatile random access memory
ODBC	Open DataBase Connectivity
OID	object ID
PCI	peripheral component interconnect
OSA	Open Systems Adapter
PCI-X	peripheral component interconnect-extended
PDF	Portable Document Format
PFA	Predictive Failure Analysis®
POST	power-on self-test
PTF	program temporary fix
RAM	random access memory
RDM	Remote Deployment Manager
RPM	(1) Red Hat Package Manager (2) revolutions per minute
RSA	Rivest-Shamir-Adleman
RXE	Remote Expansion Enclosure

Abbreviation or acronym	Definition
SAS	Serial Attached SCSI
SATA	Serial ATA
SCSI	Small Computer System Interface
SFS	shared file system
SHA	Secure Hash Algorithm
SI	Solution Install
SID	(1) security identifier (2) Oracle system identifier
SLP	service location protocol
SLPD	service location protocol daemon
SMBIOS	System Management BIOS
SMI	System Management Information
SMP	symmetric multiprocessor
SMS	Systems Management Server
SMTP	Simple Mail Transfer Protocol
SMART	Self-Monitoring, Analysis, and Reporting Technology
SMI-S	Storage Management Initiative Specification
SNMP	Simple Network Management Protocol
SPB	software package block
SQL	Structured Query Language
SSH	Secure Shell
SSL	Secure Sockets Layer
TAP	Telocator Alphanumeric Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TTL	time to live
UDP	User Datagram Protocol
UID	unique ID
UIM	upward integration module
UNC	universal naming convention
USB	Universal Serial Bus
UUID	universal unique identifier
VPD	vital product data

Abbreviation or acronym	Definition
VMRM	Virtual Machine Resource Manager
VRM	voltage regulator module
WAN	wide area network
WfM	Wired for Management
WINS	Windows Internet Naming Service
WMI	Windows Management Instrumentation
WQL	Windows Management Instrumentation Query Language
XML	extensible markup language

Glossary

This glossary includes terms and definitions from:

- The *American National Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions are identified by the symbol (A) after the definition.

- The *Information Technology Vocabulary* developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Committee (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

- The *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994.

- The *IBM Glossary of Computing Terms*, 1999.

To view other IBM glossary sources, see IBM Terminology at www.ibm.com/ibm/terminology.

A

Advanced Encryption Setting (AES)
A block cipher algorithm, also known as Rijndael, used to encrypt data transmitted between managed systems and the management server, which employs a key of 128, 192, or 256 bits. AES was developed as a replacement for DES.

Advanced System Management (ASM) interconnect
A feature of IBM service processors that enables users to connect up to 24 servers to one service processor, thus eliminating the need for multiple modems, telephones, and LAN ports. It provides such out-of-band management functions as system power control, service-processor event-log management, firmware updates, alert notification, and user profile configuration.

Advanced System Management (ASM) interconnect network
A network of IBM servers created by using the ASM interconnect feature. The servers are connected through RS-485 ports. When servers containing integrated system management processors (ISMPs) and ASM processors are connected to an ASM interconnect network, IBM Director can manage them out-of-band.

Advanced System Management (ASM) PCI adapter
An IBM service processor that is built into the Netfinity 7000 M10 and 8500R servers. It also was available as an option that could be installed in a server that contained an ASM processor. When an ASM PCI adapter is used with an ASM processor, the ASM PCI adapter acts as an Ethernet gateway, while the ASM processor retains control of the server. When used as a gateway service processor, the ASM PCI adapter can communicate with other ASM PCI adapters and ASM processors only.

Advanced System Management (ASM) processor
A service processor built into the mid-range Netfinity and early xSeries servers. IBM Director can connect out-of-band to an ASM processor located on an ASM interconnect; an ASM PCI adapter, a Remote Supervisor Adapter, or

a Remote Supervisor II must serve as the gateway service processor.

alert A message or other indication that identifies a problem or an impending problem.

alert forwarding
Alert forwarding can ensure that alerts are sent, even if a managed system experiences a catastrophic failure, such as an operating-system failure.

alert-forwarding profile
A profile that specifies where remote alerts for the service processor should be sent.

alert standard format (ASF)
A specification created by the Distributed Management Task Force (DMTF) that defines remote-control and alerting interfaces that can best serve a client system in an environment that does not have an operating system.

anonymous command execution
Execution of commands on a target system as either *system account* (for managed systems running Windows) or *root* (for managed systems running Linux). To restrict anonymous command execution, disable this feature and always require a user ID and password.

ASF See *alert standard format*.

ASM interconnect gateway
See *gateway service processor*.

association
(1) A way of displaying the members of a group in a logical ordering. For example, the Object Type association displays the managed objects in a group in folders based on their type. (2) A way to display additional information about the members of the group. For example, the Event Action Plans association displays any event action plans applied to the managed objects in the group in an Event Action Plan folder.

B

basic input/output system (BIOS)
The code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard.

BIOS See *Basic Input/Output System*.

blade server
An IBM @server 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.

bottleneck
A place in the system where contention for a resource is affecting performance.

C

chassis
The metal frame in which various electronic components are mounted.

chassis detect-and-deploy profile
A profile that IBM Director automatically applies to all new BladeCenter chassis when they are discovered. The profile settings include management module name, network protocols, and static IP addresses. If Remote Deployment Manager (RDM) is installed on the management server, the chassis detect-and-deploy profile also can include deployment policies.

CIM See *Common Information Model*.

Common Information Model (CIM)
An implementation-neutral, object-oriented schema for describing network management information. The Distributed Management Task Force (DMTF) develops and maintains CIM specifications.

component association
In the IBM Director Rack Manager task, a function that can make a managed system or device rack-mountable when the inventory collection feature of IBM Director does not recognize the managed system or device. The function associates the system or device with a predefined component.

D

Data Encryption Standard (DES)
A cryptographic algorithm designed to encrypt and decrypt data using a private key.

database server
The server on which the database application and database used with IBM Director Server are installed.

deployment policy
A policy that associates a specific bay in a BladeCenter chassis with an RDM noninteractive task. When a blade server is added to or replaced in the bay, IBM Director automatically runs the RDM task.

DES See *Data Encryption Standard*.

Desktop Management Interface (DMI)
A protocol-independent set of application programming interfaces (APIs) that were defined by the Distributed Management Task Force (DMTF). These interfaces give management application programs standardized access to information about hardware and software in a system.

Diffie-Hellman key exchange
A public, key-exchange algorithm that is used for securely establishing a shared secret over an insecure channel. During Phase II negotiations, the Diffie-Hellman group prevents someone who intercepts your key from deducing future keys that are based on the one they have.

digital signature algorithm (DSA)
A security protocol that uses a pair of keys (one public and one private) and a one-way encryption algorithm to provide a robust way of authenticating users and systems. If a public key can successfully decrypt a digital signature, a user can be sure that the signature was encrypted using the private key.

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

DMI See *Desktop Management Interface*.

E

enclosure
A unit that houses the components of a storage subsystem, such as a control unit, disk drives, and power source.

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 will manage certain events. An event action plan comprises one or more event filters and one or more customized event actions.

event-data substitution variable
A variable that can be used to customize event-specific text messages for certain event actions.

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.

extension
See *IBM Director extension*.

F

field-replaceable unit (FRU)
An assembly that is replaced in its entirety when any one of its components fails. In some cases, a FRU may contain other FRUs.

file-distribution server
In the Software Distribution task, an intermediate server that is used to distribute a software package when the redirected-distribution method is used.

forecast
A function that can provide a prediction of future performance of a managed system using past data collected on that managed system.

FRU See *field-replaceable unit*.

G

gateway service processor
A service processor that relays alerts from service processors on an Advanced

System Management (ASM) interconnect network to IBM Director Server.

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

GUID See *Universal Unique Identifier*.

I

IBM Director Agent
A component of IBM Director software. When IBM Director Agent is installed on a system, the system can be managed by IBM Director. IBM Director Agent transfers data to the management server using several network protocols, including TCP/IP, NetBIOS, and IPX.

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 database
The database that contains the data stored by IBM Director Server.

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 Capacity Manager, ServeRAID™ Manager, Remote Deployment Manager, Software Distribution.

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

IBM Director Server service
A service that runs automatically on the management server, and provides the server engine and application logic for IBM Director.

IBM Director service account
The Windows operating-system account associated with the IBM Director Server service.

in-band communication
Communication that occurs through the same channels as data transmissions. An example of in-band communication is the interprocess communication that occurs between IBM Director Server, IBM Director Agent, and IBM Director Console.

integrated system management processor (ISMP)
A service processor built into the some xSeries servers. The successor to the Advanced System Management (ASM) processor, the ISMP does not support in-band communication in systems running NetWare. For IBM Director Server to connect out-of-band to an ISMP, the server containing the ISMP must be installed on an ASM interconnect network. A Remote Supervisor Adapter or a Remote Supervisor Adapter II must serve as the gateway service processor.

interprocess communication (IPC)
1) The process by which programs communicate data to each other and synchronize their activities. Semaphores, signals, and internal message queues are common methods of interprocess communication. 2) A mechanism of an operating system that allows processes to communicate with each other within the same computer or over a network. It also is called in-band communication

inventory-software dictionary
A file that tracks the software installed on managed systems in a network.

IPC See *interprocess communication*.

ISMP See *integrated system management processor*.

J

job A separately executable unit of work defined by a user, and run by a computer.

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.

Level-1 managed system
An IBM or non-IBM server, desktop computer, workstation, and mobile computer that has IBM Director Core Services installed. IBM Director uses IBM Director Core Services to communicate with and administer the Level-2 managed system. IBM Director Core Services includes the SLP instrumentation, the IBM Director Agent SLP service type, and Common Information Model (CIM).

Level-2 managed system
An IBM or non-IBM server, desktop computer, workstation, or mobile computer that has IBM Director Agent installed. IBM Director Agent provides managed systems with the full complement of IBM Director Agent function that is used to communicate with and administer the Level-2 managed system. The function of a Level-2 managed system varies depending on the operating system and platform.

light path diagnostics
A technology that provides a lighted path to failed or failing components to expedite hardware repairs.

M

MAC address
See media access control (MAC) address.

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.

media access control (MAC) address
In a local area network, the protocol that determines which device has access to the transmission medium at a given time.

N

nonvolatile random-access memory (NVRAM)
Random access memory (storage) that retains its contents after the electrical power to the machine is shut off.

notification
See *alert*.

NVRAM
See *nonvolatile random-access memory*.

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

partition
See *scalable partition*.

PCI   See *Peripheral Component Interconnect*.

PCI-X See *Peripheral Component Interconnect-X.*

Peripheral Component Interconnect (PCI)
A standard for connecting attached devices to a computer.

Peripheral Component Interconnect-X (PCI-X)
An enhancement to the Peripheral Component Interconnect (PCI) architecture. PCI-X enhances the Peripheral Component Interconnect (PCI) standard by doubling the throughput capability and providing additional adapter-performance options while maintaining backward compatibility with PCI adapters.

PFA See *Predictive Failure Analysis.*

physical platform
An IBM Director managed object that represents a single physical chassis or server that has been discovered through the use of the Service Location Protocol (SLP).

plug-in
A software module, often written by a third party, that adds function to an existing program or application such as a Web browser. See *IBM Director extension.*

POST See *power-on self-test.*

power-on self-test
A series of internal diagnostic tests activated each time the system power is turned on.

Predictive Failure Analysis (PFA)
A scheduled evaluation of system data that detects and signals parametric degradation that might lead to functional failures.

private key
1) In secure communication, an algorithmic pattern used to encrypt messages that only the corresponding public key can decrypt. The private key is also used to decrypt messages that were encrypted by the corresponding public key. The private key is kept on the user's system and is protected by a password. 2) The secret half of a cryptographic key pair that is used with a public key algorithm. Private keys are typically used to digitally sign data and to decrypt data that has been encrypted with the corresponding public key.

public key
1) In secure communication, an algorithmic pattern used to decrypt messages that were encrypted by the corresponding private key. A public key is also used to encrypt messages that can be decrypted only by the corresponding private key. Users broadcast their public keys to everyone with whom they must exchange encrypted messages. 2) The non-secret half of a cryptographic key pair that is used with a public key algorithm. Public keys are typically used to verify digital signatures or decrypt data that has been encrypted with the corresponding private key.

R

redirected distribution
A method of software distribution that uses a file-distribution server.

remote I/O enclosure
An IBM Director managed object that represents an expansion enclosure of Peripheral Component Interconnect-X (PCI-X) slots, for example, an RXE-100 Remote Expansion Enclosure. The enclosure consists of one or two expansion kits.

Remote Supervisor Adapter
An IBM service processor. It is built into some xSeries servers and available as an optional adapter for use with others. When used as a gateway service processor, the Remote Supervisor Adapter can communicate with all service processors on the Advanced System Management (ASM) interconnect.

resolution
The occurrence of a correction or solution to a problem.

resource-monitor threshold
The point at which a resource monitor generates an event.

RXE Expansion Port
The dedicated high-speed port used to connect a remote I/O expansion unit, such as the RXE-100 Remote Expansion Enclosure, to a server.

S

scalable node

A physical platform that has at least one SMP Expansion Module. Additional attributes are assigned to a physical platform when it is a scalable node. These additional attributes record the number of SMP Expansion Modules, SMP Expansion Ports, and RXE Expansion ports on the physical chassis.

scalable object

An IBM Director managed object that is used with Scalable Systems Manager. Scalable objects include scalable nodes, scalable systems, scalable partitions, and remote I/O enclosures that are attached to scalable nodes.

scalable partition

An IBM Director managed object that defines the scalable nodes that can run a single image of the operating system. A scalable partition has a single, continuous memory space and access to all associated adapters. A scalable partition is the logical equivalent of a physical platform. Scalable partitions are associated with scalable systems and comprise only the scalable nodes from their associated scalable systems.

scalable system

An IBM Director managed object that consists of scalable nodes and the scalable partitions that are composed of the scalable nodes in the scalable system. When a scalable system contains two or more scalable nodes, the servers that they represent must be interconnected through their SMP Expansion Modules to make a multinode configuration, for example, a 16-way xSeries 455 server made from four scalable nodes.

Secure Sockets Layer (SSL)

A security protocol that provides communication privacy. SSL enables client/server applications to communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

Service Location Protocol (SLP)

In the Internet suite of protocols, a protocol that identifies and uses network hosts without having to designate a specific network host name.

service processor

A generic term for Remote Supervisor Adapters, Advanced System Management processors, Advanced System Management PCI adapters, and integrated system management processors (ISMPs). These hardware-based management processors used in IBM Netfinity and xSeries servers work with IBM Director to provide hardware status and alert notification.

SLP   See *Service Location Protocol*.

SMBIOS

See *systems management BIOS*.

SMP Expansion Module

An IBM xSeries hardware option. It is a single module that contains microprocessors, disk cache, random access memory, and three SMP Expansion Port connections. Two SMP Expansion Modules can fit in a chassis.

SNMP Access and Trap Forwarding

An IBM Director Agent feature that enables SNMP to access managed-system data. When installed on a managed system, this feature enables SNMP-based managers to poll the managed system and receive its alerts. If System Health Monitoring is installed on the managed system also, hardware alerts can be forwarded as SNMP traps.

SNMP device

A network device, printer, or computer that has an SNMP device installed or embedded.

SQL   See *Structured Query Language*

SSL   See *Secure Sockets Layer*.

static partition

A view-only scalable partition.

sticky key

An input method that enables the user to press and release a series of keys sequentially (for example, Ctrl+Alt+Del), yet have the keys behave as if they were pressed and released at the same time. This method can be used for those who require special-needs settings to make the keyboard easier to use.

Structured Query Language (SQL)
A standardized language for defining and manipulating data in a relational database.

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.

System Health Monitoring
An IBM Director Agent feature that provides active monitoring of critical system functions, including system temperatures, voltages, and fan speeds. It also handles in-band alert notification for managed systems running Windows and some managed systems running Linux.

system variable
A user-defined keyword and value pair that can be used to test and track the status of network resources. System variables can be referred to wherever event-data substitution is allowed.

systems management BIOS (SMBIOS)
A key requirement of the Wired for Management (WfM) 2.0 specification. SMBIOS extends the system BIOS to support the retrieval of management data required by the WfM specification. To run IBM Director Agent, a system must support SMBIOS, version 2.2 or later.

T

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

time to live (TTL)
A technique used by best-effort delivery protocols to inhibit endlessly looping packets. The packet is discarded if the TTL counter reaches 0.

triple data encryption standard (DES)
A block cipher algorithm that can be used to encrypt data transmitted between managed systems and the management server. Triple DES is a security enhancement of DES that employs three successive DES block operations.

TTL See *time to live*.

U

universal unique identifier (UUID)
A 128-bit character string guaranteed to be globally unique and used to identify components under management.

uptime
The time during which a system is working without failure.

upward integration
The methods, processes and procedures that enable lower-level systems-management software, such as IBM Director Agent, to work with higher-level systems-management software, such as Tivoli Enterprise™ or Microsoft SMS.

upward integration module
Software that enables higher-level systems-management software, such as Tivoli Enterprise or Microsoft Systems Manager Server (SMS), to interpret and display data provided by IBM Director Agent. This module also can provide enhancements that start IBM Director Agent from within the higher-level systems-management console, as well as collect IBM Director inventory data and view IBM Director alerts.

UUID See *universal unique identifier*.

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*.

W

Wake on LAN®
A technology that enables a user to remotely turn on systems for off-hours maintenance. A result of the Intel-IBM Advanced Manageability Alliance and part of the Wired for Management Baseline Specification, users of this technology can remotely turn on a server and control it across the network, thus

saving time on automated software installations, upgrades, disk backups, and virus scans.

walk An SNMP operation that is used to discover all object instances of management information implemented in the SNMP agent that can be accessed by the SNMP manager.

Windows Management Instrumentation (WMI)
An application programming interface (API) in the Windows operating system that enables devices and systems in a network to be configured and managed. WMI uses the Common Information Model (CIM) to enable network administrators to access and share management information.

WMI See *Windows Management Instrumentation*.

WMI Query Language (WQL)
A subset of the Structured Query Language with minor semantic changes to support Windows Management Instrumentation.

WQL See *WMI Query Language*.

Index

Readers' Comments — We'd Like to Hear from You

IBM Systems
IBM Director Capacity Manager
Installation and User's Guide
Version 5.10

Overall, how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	☐	☐	☐	☐	☐

How satisfied are you that the information in this book is:

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	☐	☐	☐	☐	☐
Complete	☐	☐	☐	☐	☐
Easy to find	☐	☐	☐	☐	☐
Easy to understand	☐	☐	☐	☐	☐
Well organized	☐	☐	☐	☐	☐
Applicable to your tasks	☐	☐	☐	☐	☐

Please tell us how we can improve this book:

Thank you for your responses. May we contact you?   ☐ Yes   ☐ No

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

Name _____   Address _____

Company or Organization _____

Phone No. _____

Readers' Comments — We'd Like to Hear from You

IBM

Cut or Fold
Along Line

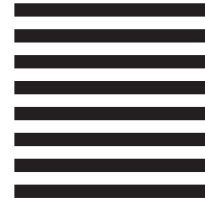Fold and Tape   **Please do not staple**   Fold and Tape

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL   PERMIT NO. 40   ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

International Business Machines Corporation
Dept. CGFA
PO Box 12195
Research Triangle Park, NC   27709-9990

Fold and Tape   **Please do not staple**   Fold and Tape

Cut or Fold
Along Line

IBM ®

Printed in USA