IBM Director 4.22

IBM

Release Notes

> **Note**
>
> Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 49.

Contents

Chapter 1. About this release

IBM® Director 4.22 is an upgrade release to the following versions of IBM Director:

- IBM Director 4.1
- IBM Director 4.10.2
- IBM Director 4.11
- IBM Director 4.12
- IBM Director 4.20
- IBM Director 4.20.2
- IBM Director 4.21

The *IBM Director 4.22 Release Notes* (dir4.22_docs_relnotes.pdf) is a new document created specifically to support IBM Director 4.22. This document contains the types of information that were provided in readme.txt files for previous releases of IBM Director.

The *IBM Director 4.22 Release Notes* are provided as an addition to the following IBM Director release notes and readme files. Make sure that you read all of these documents.

- *IBM Director 4.21 Release Notes* (dir4.21_docs_relnotes.pdf)
- IBM Director 4.20.2 readme file (dir4.20.2_readme.txt)
- IBM Director 4.20 readme file (dir4.20_readme.txt)

These documents are included on the *IBM Director 4.22* CD and are in the docs directory.

Additionally, these documents can be accessed from the IBM Support Web page at http://www-307.ibm.com/pc/support/site.wss/document.do?lndocid=SERV-DIRECT.

This Web page provides information about several IBM Director releases. From this Web page, you can display release-specific Web pages for IBM Director versions that contain each of these documents.

New in this release

IBM Director 4.22 adds the following new features, functions, and enhancements:

Alert Standard Format 2.0 on Linux systems
> IBM Director 4.22 adds support for Alert Standard Format (ASF) 2.0 on the following servers running Linux®:
> - xSeries® 206 (32-bit operating systems only)
> - xSeries 226 (32-bit and EM64T operating systems only)

Alert Standard Format on Windows x64 systems
> IBM Director 4.22 adds support for ASF on the following servers that are running Windows x64 operating systems:
> - xSeries 226
> - Intellistation A-Pro

BladeCenter® options
> IBM Director 4.22 contains the following enhancements:
> - Support for @server® BladeCenter LS20.

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- Support for the QLogic iSCSI Expansion Card
- Support for the Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module (IGESM). This switch is also known as the *Cisco Fiber IGESM*.
- Clarification about support for installing IBM Director Server on a blade server. See "BladeCenter deployment infrastructures" on page 17.

Java® Runtime Environment (JRE)

The Java Runtime Environment (JRE), version 1.3.1, in IBM Director 4.22 has been upgraded to service level 8.

IBM TotalStorage®

IBM Director 4.22 adds support for IBM TotalStorage DS4000 series storage systems. This support is provided by new storage managed objects in IBM Director. For more information, see "Storage managed objects" on page 26.

IBM Director 4.22 also adds support for launching IBM DS4000 Storage Manager from IBM Director Console. For more information, see "Starting external applications for storage devices" on page 27.

Operating systems for IBM Director Agent

IBM Director 4.22 adds support for installing IBM Director Agent on the following operating systems:

- Red Hat Enterprise Linux AS, ES, and WS, version 4.0, for systems with Intel x86 processors
- Red Hat Enterprise Linux AS, ES, and WS, version 4.0, for systems with Intel EM64T or AMD Opteron processors
- VMware GSX Server, version 3.1 and 3.2. For a list of the supported guest operating systems, see the *IBM Director Hardware and Software Compatibility* document.
- Windows Server 2003, Datacenter x64 Edition
- Windows Server 2003, Standard and Enterprise x64 Editions
- Windows XP Professional x64 Edition

Scalable systems support for xSeries 460 servers

IBM Director 4.22 adds support for scalable systems and scalable partitions configured on xSeries 460 servers (Scalable Systems Manager 4.20 does not provide support for this server). For more information, see "Scalable systems and scalable partition support for xSeries 460 servers" on page 20.

ServeRAID hardware and software

IBM Director 4.22 adds support for the IBM ServeRAID-8i Serial Attached SCSI (SAS) RAID Controller. It also contains an updated ServeRAID Manager task, which is based on the stand-alone version of ServeRAID Manager 8.0. This ServeRAID Manager task can manage SAS RAID array configurations.

Upward Integration Modules (UIMs)

IBM Director 4.22 adds support for Upward Integration Modules (UIMs) with HP OpenView 7.01 on supported Windows and Linux operating systems.

For the most recent information about hardware or software support, including operating system support that has been added to a specific version of IBM Director after it's initial release, see the *IBM Director Hardware and Software Compatibility* document. You can download the PDF file from the IBM Director Agent Web page at http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/ibmdiragent.html

Authorized Program Analysis Reports resolved by this release

IBM Director 4.22 resolves the following Authorized Program Analysis Reports (APARs):

IC44576

(IBM Director 4.20 Agent only running on Windows 2000 or Windows 2003) Logging into Web-based Access through a Web browser permitted management of the managed system, but it caused the user account that was entered during login to be locked out.

IC44652

Enumeration of non-RAID classes could fail after the enumeration of a RAID class.

IC44672

(IBM Director 3.11 Agent communicating with IBM Director Server 4.12 and later only) The File Transfer task could not transfer a file from a managed system to the management server.

IC44695

(IBM Director 4.20 Agent running on Windows 2000 Advanced Server) Inventory of a managed system was unsuccessful and displayed an error window (ticscanagent.exe) when IBM Director obtained incorrect data while retrieving the serial number for an IDE Raid drive.

IC44857

(IBM Director Agent and Web-based Access only) The Web-based Access interface was not installed completely when another application that was installed before IBM Director Agent had inserted an older version of the Open Source Toolkit (OpenSSL executable) than that required by IBM Director into the Windows PATH.

IC44935

(Inventory only) The value of the Asset Tag field, which is displayed under the Physical Enclosure properties and is obtained from system BIOS, incorrectly contained the serial number of a system instead of the value configured for the asset tag. (The serial number will continue to be displayed if the asset tag value is not set.)

IC44937

IBM Director sometimes incorrectly reported the network port number of an onboard network adapter in messages that indicated a change in state for this adapter. Starting with IBM Director 4.22, the network port number has been removed from IBM Director messages.

IC45087

IBM Director did not provide event substitution variables that represent a host name, IP address, or universal unique identifier (UUID) of a managed system. In IBM Director 4.22, &hostname, &ipaddr, and &uuid have been added as event substitution variables.

IC45108

(IBM Director Agent on cluster systems running Windows Server 2003 and Microsoft Exchange Server 2003 only) The file PegasusProviderAdapter.exe had increased CPU usage over time and eventually reached an unacceptable high level of CPU utilization.

IC45209

(IBM Director Agent only) Common Information Model (CIM) information was not returned by IBM Director Agent when it encountered a host name in which the first letter was an alphabetic character and the remainder of the name was numeric characters.

IC45277

(IBM Director Agent on xSeries servers running on Windows operating systems only) IBM Director Agent could not forward Tivoli Enterprise Console® events to IBM Director Server when IBM Director Server was installed in a location other than the default.

IC45293

(Web-based access only) IBM Director 4.21 used Apache HTTP Server 1.3.26; IBM Director 4.22 uses Apache HTTP Server 1.3.33, which includes the most recent Apache security fixes.

IC45295

(BladeCenter only) Sometimes a physical platform managed object that represented a blade server had a connection status of "bad destination."

IC45495

A process task that monitored a process did not work reliably when encryption was enabled for communication between IBM Director Server and its managed objects.

IC45649

When at least one device in a group was offline, certain tasks, such as the Perform Inventory Collection task, were grayed out (disabled) for the entire group.

IC45830

(BladeCenter only) Discovery or addition of a BladeCenter chassis took an excessive amount of time.

IC45858

SNMP traps were not forwarded under some SNMP trap configurations.

IC45912

(IBM Director Agent only) Sometimes incorrect information from the service processor for a power supply caused a power supply alert about power supply devices having a possible loss of redundancy or loss of spare

IC45960

(Windows only) Systems that installed MPA with IBM Director received event log messages with java exceptions, which eventually caused the system to stop.

IC46166

(IBM Director Server only) IBM Director did not handle physical platform discovery well during transitions between discovery of a Remote Supervisor Adapter II and discovery of a Baseboard Management Controller (BMC) onboard processor.

IC46167

(IBM Director Console only) The "Simple Event Filter Builder" window allowed deletion of event types without providing any warning.

IC46173

(IBM Director Console only) Rapidly opening and closing the "Display System Attributes" window for physical platform managed objects caused null pointer exception errors to occur.

Compatibility with earlier versions

Versions of IBM Director earlier than IBM Director 3.1 are not compatible with IBM Director 4.22. Further, you cannot directly upgrade from IBM Director 3.1 or 3.11 to IBM Director 4.22. For more information, see "Upgrades from previous releases of IBM Director" on page 7.

IBM Director Server 4.22 can manage systems running IBM Director Agent, version 3.1 or later. This enables you to manage systems that are running operating systems that are not supported by IBM Director Agent 4.22.

IBM Director information resources

You can find additional information about IBM Director in the product documentation and on the World Wide Web.

Documentation

In addition to the IBM Director 4.22 release notes and readme files, IBM Director 4.22 is supported by the following IBM Director 4.20 documentation which is on the *IBM Director 4.22* CD:

- *IBM Director 4.20 Installation and Configuration Guide Third Edition, July 2004* (dir4.20_docs_install.pdf)
- *IBM Director 4.20 Systems Management Guide Third Edition, July 2004* (dir4.20_docs_sysmgt.pdf)

The following documents are available from the IBM Support Web site:

- *IBM Director 4.20 Events Reference* (dir4.20_events.pdf)
- *IBM Director 4.20 Upward Integration Modules Installation Guide Second Edition, July 2004* (dir4.20_docs_uim.pdf)

This documentation is in Portable Document Format (PDF). You need Adobe Acrobat Reader or xpdf to view it. Check the IBM Support Web site regularly for updated IBM Director documentation.

World Wide Web resources

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

IBM Director 4.x - software download matrix

> http://www-307.ibm.com/pc/support/site.wss/document.do?lndocid=
> SERV-DIRECT
>
> From this Web page, you can display release-specific Web pages for IBM Director. Use the release-specific Web pages to download the following IBM Director code and information for a specific release:
>
> - CD image
> - Documentation
> - IBM LM78 and system management bus (SMBus) device drivers for Linux
> - Readme files
> - Extensible Markup Language (XML) files for use with the Software Distribution task

Check these Web pages regularly for updated readme files and documentation.

IBM Director Agent page

http://www.ibm.com/servers/eserver/xseries/systems_management/ sys_migration/ibmdiragent.html

Download the *IBM Director Hardware and Software Compatibility* document from this Web page. This document lists supported @server and xSeries systems, as well as all supported operating systems. It is updated every 6 - 8 weeks.

IBM @server Information Center

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

Obtain information about the IBM Virtualization Engine™ and IBM Director Multiplatform.

IBM ServerProven® page

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

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

IBM Support page

http://www.ibm.com/pc/support/

Locate support for IBM hardware and systems-management software. For systems-management software support, click **Systems management**.

IBM Systems Management Software: Download/Electronic Support page

http://www.ibm.com/pc/us/eserver/xseries/systems_management/dwnl.html

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

IBM xSeries Systems Management page

http://www.ibm.com/pc/ww/eserver/xseries/systems_management/index.html

Obtain an overview of IBM systems management and IBM Director. This Web page also contains links to Web pages for IBM Director extensions including Remote Deployment Manager, Scalable Systems Manager, Server Plus Pack, and Software Distribution (Premium Edition).

Chapter 2. Installation and upgrade information

You can install and upgrade IBM Director in the following ways:
- Using the *IBM Director 4.22* CD
- Using packages downloaded from the IBM Support Web site

Before you install or upgrade IBM Director, see "Installation considerations when using Server Plus Pack extensions."

Upgrades from previous releases of IBM Director

If you are running one of the following versions of IBM Director on a supported operating system, you can upgrade to IBM Director 4.22:
- IBM Director 4.1
- IBM Director 4.10.2
- IBM Director 4.11
- IBM Director 4.12
- IBM Director 4.20
- IBM Director 4.20.2
- IBM Director 4.21

Note: You cannot upgrade IBM Director, version 3.1 or 3.1.1. You must uninstall version 3.1 or 3.1.1 and then install version 4.22.

IBM Director Server and IBM Director Console must be at the same release level. If you upgrade to IBM Director Server 4.22, you must upgrade all instances of IBM Director Console also.

If IBM Director Console and IBM Director Agent are installed on the same system, both software components must be at the same release level as IBM Director Server.

(Linux installations only) If you are upgrading either IBM Director Server or IBM Director Agent to version 4.22, consider the following points:
- If the IBM LM78 device driver for Linux, version 4.20 or 4.21, is installed on the managed system or management server, you must uninstall the device driver and then install the IBM LM78 device driver, version 4.22.
- If the IBM SMBus device driver for Linux, version 4.1, 4.11, 4.12, 4.20, or 4.21, is installed on the managed system or management server, you must uninstall the device driver and then install the IBM SMBus device driver, version 4.22.

Installation considerations when using Server Plus Pack extensions

The IBM Director Server Plus Pack includes the following extensions:
- Active PCI Manager
- Capacity Manager
- Rack Manager
- Software Rejuvenation
- System Availability

If you include Server Plus Pack extensions in your IBM Director environment, IBM Director 4.22 requires the IBM Director Server Plus Pack, version 4.20. See Table 1 on page 8 for more information about upgrading an IBM Director environment that contains Server Plus Pack extensions.

Table 1. Server Plus Pack considerations for IBM Director 4.22

Current IBM Director environment	Server Plus Pack considerations
• IBM Director, versions 4.20, 4.20.2, or 4.21 • Any of the Server Plus Pack extensions	The IBM Director 4.22 upgrade retains the extensions that you have installed.
• IBM Director, versions 4.10, 4.10.2, 4.11, or 4.12 • Any of the Server Plus Pack extensions	The IBM Director 4.22 upgrade retains the extensions that you have installed. However, after the upgrade is completed, you must use the Software Distribution task to upgrade the Server Plus Pack extensions on your managed systems to version 4.20. **Note:** The Rack Manager extension does not have a component on managed systems. You must upgrade the Rack Manager component on the management server to version 4.20.
IBM Director, versions 3.1 or 3.1.1	You must uninstall IBM Director, version 3.1 or 3.1.1, before you install IBM Director 4.22. You must purchase and install the Server Plus Pack, version 4.20 when you install IBM Director 4.22.

Installations and upgrades using the IBM Director CD

Important: If you want to upgrade IBM Director, version 4.20, 4.20.2, or 4.21, to IBM Director 4.22, you must use the applicable packages from the IBM Support Web site. For more information, see Table 2 on page 9.

You can use the *IBM Director 4.22* CD to perform the following tasks:
- Install IBM Director 4.22
- Upgrade an existing IBM Director installation, version 4.10, 4.11, or 4.12, to version 4.22

Important:

1. If you want to upgrade IBM Director, version 4.20, 4.20.2, or 4.21, to IBM Director 4.22, you must use the applicable packages from the IBM Support Web site. For more information, see Table 2 on page 9.
2. IBM Director Agent support for servers with Itanium processors is no longer included on the *IBM Director 4.22* CD and is available only from the IBM Support Web site.
3. For systems with Intel EM64T or AMD Opteron processors, install the 32-bit IBM Director software.

For information about installing or upgrading IBM Director 4.22, see the *IBM Director 4.20 Installation and Configuration Guide*.

Installations and upgrades using packages from the IBM Support Web site

This release of IBM Director provides packages that you can use to install or upgrade IBM Director components running on Windows, AIX, or Linux. You can download these packages from the following IBM Support Web page at http://www.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-49213

Note: For a list of the operating systems supported by IBM Director, see the *IBM Director Hardware and Software Compatibility* document at http://www.ibm.com/servers/eserver/xseries/systems_management/ sys_migration/ibmdiragent.html.

The packages contain self-extracting executable files.

Note: You can use the XML files provided with IBM Director Update Assistant to install your upgrade packages. For information on how to upgrade IBM Director Agent using the IBM Director Update Assistant, see the *IBM Director 4.20 Installation and Configuration Guide*.

Table 2 lists the packages that you can use to upgrade IBM Director, version 4.20, 4.20.2, or 4.21 for Windows (32-bit or 64-bit) to version 4.22.

Table 2. Packages that provide an upgrade to a current installation

If you want to:	Use this package:	Files in the package:
Upgrade IBM Director Agent, version 4.20, 4.20.2, or 4.21 for Windows (32-bit) to version 4.22	dir4.22_agent_patch_windows.zip	• IBMDirectorAgentPatch4.22.exe • diragentpatch_windows.xml • IBMDirectorAgentPatch4.22.msp
Upgrade IBM Director Agent, version 4.20, 4.20.2, or 4.21 for Windows (64-bit Itanium) to version 4.22	dir4.22_agent_patch_windows64.zip	• IBMDirectorAgentPatch4.22.exe • diragentpatch_windows64.xml • IBMDirectorAgentPatch4.22.msp
Upgrade IBM Director Console, version 4.20, 4.20.2, or 4.21 for Windows to version 4.22	dir4.22_console_patch_windows.zip	• IBMDirectorConsolePatch4.22.exe • IBMDirectorConsolePatch4.22.msp
Upgrade IBM Director Server, version 4.20, 4.20.2, or 4.21 for Windows to version 4.22	dir4.22_server_patch_windows.zip	• IBMDirectorServerPatch4.22.exe • IBMDirectorServerPatch4.22.msp

Table 3 lists packages that you can use to:
- Install IBM Director 4.22 for Windows (32-bit or 64-bit)
- Upgrade an existing IBM Director installation, versions 4.1, 4.10.2, 4.11, 4.12, for Windows (32-bit or 64-bit) to version 4.22.

Notes:

1. You cannot use these packages to upgrade existing IBM Director components, version 4.20, 4.20.2, or 4.21. Instead, use the IBM Director for Windows upgrade (see Table 2).
2. You cannot upgrade IBM Director, version 3.1 or 3.1.1. You must uninstall version 3.1 or 3.1.1 and then install version 4.22.

Table 3. Packages that provide a full installation of IBM Director 4.22

If you want to:	Use this package:	Files in the package:
• Install IBM Director Agent 4.22 for Windows (systems with 32-bit, EM64T, or Opteron processors) • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, or 4.12, for Windows to version 4.22	dir4.22_agent_windows.zip	• IBMDirectorAgent4.22.exe • diragent_windows.xml • diragent_windows_*xx*.xml [1] • diragent.rsp

Table 3. Packages that provide a full installation of IBM Director 4.22 (continued)

If you want to:	Use this package:	Files in the package:
• Install IBM Director Agent 4.22 for Windows (64-bit Itanium) • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, or 4.12, for Windows (64-bit Itanium) to version 4.22	dir4.22_agent_windows64.zip	• IBMDirectorAgent4.22.exe • diragent_windows64.xml • diragent_windows64_*xx*.xml [1] • diragent.rsp
• Install IBM Director Console 4.22 for Windows • Upgrade IBM Director Console, versions 4.1, 4.10.2, 4.11, or 4.12, for Windows to version 4.22	dir4.22_console_windows.zip	• IBMDirectorConsole4.22.exe • dircon.rsp
• Install IBM Director Server 4.22 for Windows • Upgrade IBM Director Server, versions 4.1, 4.10.2, 4.11, or 4.12, for Windows to version 4.22	dir4.22_server_windows.zip	IBMDirectorServer4.22.exe **Note:** This file does not support unattended or silent installations.

1. Where *xx* indicates the language for the installation:
  • de is German
  • es is Spanish
  • fr is French
  • ja is Japanese
  • ko is Korean
  • zh_CN is Simplified Chinese
  • zh_TW is Traditional Chinese
 	
Note: The English installation file names do not contain a language indicator.		

Table 4 lists the packages that you can use for systems running AIX and Linux.

Table 4. Packages for systems running AIX and Linux

If you want to:	Use this package:	Files in the package:
• Install IBM Director Agent 4.22 for AIX • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for AIX to version 4.22	dir4.22_agent_aix.tar	IBMDirectorAgent4.22-1.bin
• Install IBM Director Agent 4.22 for Linux • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Linux to version 4.22	dir4.22_agent_linux.tar.gz	• IBMDirectorAgent4.22-1.sh • diragentpatch_linux.xml • diragentpatch_linux_*xx*.xml [1] • diragent_linux.xml • diragent_linux_*xx*.xml [1] • dirinstall.alt
• Install IBM Director Console 4.22 for Linux • Upgrade IBM Director Console, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Linux to version 4.22	dir4.22_console_linux.tar.gz	• IBMDirectorConsole4.22-1.sh • dirinstall.alt

Table 4. Packages for systems running AIX and Linux (continued)

If you want to:	Use this package:	Files in the package:
Upgrade IBM Director Agent and IBM Director Console, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Linux to version 4.22 **Note:** You must use this package on any system that has both IBM Director Agent and IBM Director Console installed.	dir4.22_agentconsoleupgrade_linux.tar.gz	• IBMDirectorAgentConsolePatch 4.22-1.sh • dirpatch
• Install IBM Director Server 4.22 for Linux • Upgrade IBM Director Server, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Linux to version 4.22	dir4.22_server_linux.tar.gz	• IBMDirectorServer4.22-1.sh • dirinstall.alt
• Install IBM Director Agent 4.22 for Power Linux • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Power Linux to version 4.22	dir4.22_agent_ppclinux.tar.gz	• IBMDirectorAgent4.22-1.sh • diragentpatch_plinux.xml • diragentpatch_plinux_*xx*.xml [1] • diragent_plinux.xml • diragent_plinux_*xx*.xml [1] • dirinstall.alt
• Install IBM Director Agent 4.22 for Linux on 64-bit Itanium processors • Upgrade IBM Director Agent, versions 4.1, 4.10.2, 4.11, 4.12, 4.20, 4.20.2, or 4.21, for Linux on 64-bit Itanium processors to version 4.22	dir4.22_agent_linux64.tar.gz	• IBMDirectorAgent4.22-1.sh • diragentpatch_linux64.xml • diragentpatch_linux64_*xx*.xml [1] • diragent_linux64.xml • diragent_linux64_*xx*.xml [1] • dirinstall.alt

1. Where *xx* indicates the language for the installation:
   - de is German
   - es is Spanish
   - fr is French
   - ja is Japanese
   - ko is Korean
   - zh_CN is Simplified Chinese
   - zh_TW is Traditional Chinese

   Note: The English installation file names do not contain a language indicator.

Installing or upgrading on Windows

Note: The Microsoft software patch (MSP) files are provided for customers who prefer to use Windows Installer and understand how to use Windows Installer upgrade package files.

Installing an IBM Director 4.22 upgrade on Windows

Complete the following steps to install an IBM Director upgrade on a system running Windows:

1. Select the applicable package for your upgrade (see Table 2 on page 9).
2. From a command prompt, type one of the following case-sensitive commands and press **Enter**:

If you want to perform:	Type this command:
A standard upgrade	*filename.exe*
An unattended upgrade	*filename.exe* /v /qb
A silent upgrade	*filename.exe* /S /v /qn

where *filename.exe* is the name of the executable file.

Note: A *standard* installation invokes the InstallShield wizard. An *unattended* installation shows the progress of the installation but does not require any user input. *A silent* installation suppresses all output to the screen during installation.

Installing IBM Director 4.22 on Windows

Complete the following steps to install IBM Director 4.22 on a system running Windows:

1. Select the appropriate package for your installation (see Table 3 on page 9).
2. If you do not want to customize the default installation options, go to step 5.
3. If you want to customize the default installation options, open the diragent.rsp file in an ASCII text editor.
4. Modify and save the diragent.rsp file. This file follows the Windows INI file format and is fully commented.
5. From the command prompt, type one of the following case-sensitive commands and press **Enter**:

If you want to perform:	Type this command:
A standard installation	*filename.exe*
An unattended installation	*filename.exe* -a UNATTENDED RSP=″*responsefile.rsp*″
A silent installation	*filename.exe* -s -a SILENT RSP=″*responsefile.rsp*″

Note: Unattended and silent installations are not supported for the IBM Director Server installation.

where:

- *filename.exe* is the name of the executable file.
- RSP is an optional parameter that you can use to specify a customized response file.
- *responsefile.rsp* is the path and name of the customized response file that you created in step 4.

Note: A *standard* installation invokes the InstallShield wizard. An *unattended* installation shows the progress of the installation but does not require any user input. *A silent* installation suppresses all output to the screen during installation.

Installing and upgrading on AIX or Linux

This section provides instructions for installing and upgrading IBM Director on systems running AIX or Linux.

Installing IBM Director Agent, IBM Director Console, or IBM Director Server, version 4.22, on Linux

Complete the following steps to install IBM Director on a system running Linux:

1. Select the applicable package for your installation (see Table 4 on page 10).
2. If you do not want to customize the default installation options, go to step 5.
3. If you want to customize the default installation options, open the dirinstall.alt file in an ASCII text editor.
4. Modify and save the file. This file is fully commented.
5. (Optional) To save the RPM files, from a command prompt, type the following command and press **Enter**:

   filename -x *directory*

   where *filename* is the name of the executable file, and *directory* is the fully qualified name of the directory to which you want to write the RPM files.
6. To install IBM Director, type the following command and press **Enter**:

   filename -r *installfile*

   where:

   - *filename* is the name of the executable file.
   - -r *installfile* is an optional parameter that you can use to specify a customized installation script, and *installfile* is the fully qualified name of the installation script.

Installing IBM Director Agent and IBM Director Console upgrade, version 4.22, on Linux

Complete the following steps to upgrade a system running Linux and both IBM Director Agent and IBM Director Console:

1. If you do not want to customize the default installation options, go to step 4.
2. If you want to customize the default installation options, open the dirpatch file in an ASCII text editor.
3. Modify and save the file. This file is fully commented.
4. (Optional) To save the RPM files, from a command prompt, type the following command and press **Enter**:

   filename -x *directory*

   where *filename* is the name of the executable file, and *directory* is the fully qualified name of the directory to which you want to write the RPM files.
5. To install IBM Director, type the following command and press **Enter**:

   filename -r *installfile*

   where:

   - *filename* is the name of the executable file.
   - -r *installfile* is an optional parameter that you can use to specify a customized installation script, and *installfile* is the fully qualified name of the installation script.

Installing IBM Director Agent on Red Hat 4.0 systems with AMD Opteron or Intel EM64T processors

The installation of the IBM Director Agent package on Red Hat 4.0 systems requires the installation of the compat-libstdc++ package, which is on the fourth CD of the *Red Hat 4 for x86-64* CD set. Further, the compat-libstdc++ package may require installation of the libgcc package.

For Red Hat Enterprise Linux, version 4.0, this file is on the second CD of the same CD set and is named libgcc-3.4.3-9.EL4.i386.rpm. Later releases from Red Hat could have a different location and name for this file.

Information about uninstalling

For complete information about uninstalling IBM Director 4.22, use the procedures in the *IBM Director 4.20 Installation and Configuration Guide*.

For installations that include the BladeCenter SAN Utility Extension for IBM Director, you must uninstall this extension before uninstalling IBM Director Server or IBM Director Console. If you do not uninstall the BladeCenter SAN Utility Extension for IBM Director, a later reinstallation of IBM Director Server or IBM Director Console will succeed, but IBM Director Server or IBM Director Console will fail to start.

For these instructions, see the readme file for the BladeCenter SAN Utility Extension for IBM Director that is installed on your system. You can download the appropriate BladeCenter SAN Utility Extension for IBM Director and its readme file from the QLogic Web page at http://www.qlogic.com/support/oem_detail_all.asp?oemid=324.

Chapter 3. Limitations, general problems, and workarounds

This chapter contains information about limitations, general problems, and workarounds.

Limitations

IBM Director 4.22 has the following limitations:

IBM Director Agent running on Red Hat Enterprise Linux 4.0 operating systems

IBM Director Agent running on Red Hat Enterprise Linux 4.0 operating systems has the following limitations:

- Less inventory information is returned to IBM Director Server than that returned for inventory information from other operating systems.
- There are no hardware events generated for these managed-systems.
- Common Information Model (CIM) monitors are not supported.

IBM Director Console

IBM Director Console is not supported on the GNOME desktop environment. This limitation applies whether IBM Director Console is installed as part of the IBM Director Server installation on a management server or by itself on a management console.

Linux systems

The Net-SNMP service (snmpd) must be started before the IBM Director SNMP Agent for Linux (dirsnmpd) is started. Otherwise, the IBM Director SNMP Agent cannot handle incoming Simple Network Management Protocol (SNMP) requests. This limitation does not apply to SNMP traps on Linux systems.

ServeRAID-8i Controller on xSeries 366 and xSeries 460 running Windows 2003 x64 Editions only

On xSeries 366 and xSeries 460 servers that are using the IBM ServeRAID-8i Serial Attached SCSI (SAS) RAID Controller on systems running Windows 2003 x64 Editions, you cannot use the ServeRAID Manager task in IBM Director 4.22 to create a RAID level-10 logical drive. Instead, you must use version 8.00.19 of the stand-alone ServeRAID Manager that comes with the ServeRAID option that you are using. Do so by either booting from the support CD or by running the stand-alone version, which was previously installed from the application CD.

If you use the ServeRAID Manager task in IBM Director 4.22 with the current Windows 2003 64-bit SAS driver (version 7778), a blue screen trap occurs. A future version of the Windows 2003 64-bit SAS driver will address this problem.

xSeries 226 servers running Linux with ASF

On xSeries 226 servers that are running the Linux operating system, additional RPM files should be installed for ASF 2.0 support. These additional RPM files are not available on the *IBM Director 4.22* CD. Instead, they will be available for download directly from the support pages for the xSeries 226 server. However, at the time of this release, these RPM files are not yet available on the xSeries 226 server download page.

Note: ASF 2.0 can still work properly in the absence of these RPM files; however, you will have to use the Configure Alert Standard Format

(ASF) task from IBM Director Console to manually enter the IP address, subnet mask and gateway address. For information about this task, see the *IBM Director 4.20 Systems Management Guide*.

General problems

This section contains information about these general problems found in IBM Director 4.22:

Note: Also see "Solving IBM Director problems" in either the *IBM Director 4.20 Systems Management Guide* or the *IBM Director 4.20 Installation and Configuration Guide* for additional information about known problems.

Mozilla browser

> **Note:** IBM Director UIM for HP OpenView on Linux only

> When the Mozilla browser is used with IBM Director 4.22 UIM for HP OpenView on Linux, this browser requires that the underlying system is running the Red Hat Linux Advanced Server, version 2.1 operating system with update 6 or later. Otherwise, the Mozilla browser stops responding when you access the IBM Director help system. You can download the latest Red Hat updates from https://www.redhat.com/security/updates/notes/.

Workarounds

This section contains workarounds for the following problems:
- An inability to use the Deployment Wizard task to apply a profile to a group of BladeCenter chassis that have a mixed online and offline status.
- Storage managed objects that are locked are not present in IBM Director Console after IBM Director Server is stopped and restarted.

Using the Deployment Wizard task to apply a profile to a group of BladeCenter chassis

You can use the BladeCenter Deployment wizard to create a profile that contains BladeCenter chassis configuration information. When you run the wizard online (targeted against one or more BladeCenter chassis), make sure that all the chassis that you target are actually online. If you target a group of BladeCenter chassis that have a mixed online and offline status, the Deployment Wizard will not apply the profile to any of the BladeCenter chassis that you targeted, even if they are online.

Rediscovering locked storage managed objects after restarting IBM Director

After IBM Director Server is stopped and restarted, you must rediscover all storage devices. This rediscovery is necessary because IBM Director Console does not display any previously created storage managed objects that were locked when IBM Director Server was stopped and restarted.

From IBM Director Console, click **Tasks → Discover Systems → SMI-S Storage Devices** to discover storage devices supported by IBM Director.

Chapter 4. Updates to the IBM Director 4.20 documentation

This chapter provides information about the changes to the documentation and online help that have occurred since IBM Director 4.20 was released.

The documentation updates include the following topics:
- "Documentation updates in the IBM Director 4.21 Release Notes"
- "BladeCenter deployment infrastructures"
- "Creation of management processor objects" on page 19
- "Scalable systems and scalable partition support for xSeries 460 servers" on page 20
- "Storage managed objects" on page 26

Documentation updates in the IBM Director 4.21 Release Notes

See the *IBM Director 4.21 Release Notes* for documentation updates related to the following functionality:
- Exporting and importing threshold tasks
- Help for network driver configuration
- IBM LM78 and SMBus device drivers for Linux
- New events
- Remote Control usage
- Restricting anonymous command execution
- twgrestore and twgsave commands
- Using PostgreSQL as the IBM Director database

BladeCenter deployment infrastructures

IBM Director 4.22 supports installing IBM Director Server on a blade server and using that instance of IBM Director to manage the BladeCenter unit. Previously, if you wanted to use IBM Director to manage a BladeCenter unit, you needed to install IBM Director Server on a non-blade server.

For more information on these two configurations, see the following documentation:
- To use a non-blade server as the management server, see the information in Chapter 3, "Planning your IBM Director installation", of the *IBM Director 4.20 Installation and Configuration Guide*. The information is in the section titled "Setting up a BladeCenter deployment infrastructure".

   Note: The "Important" reference in this section is no longer applicable.
- To use a blade server as the management server, see the remainder of this section. This scenario has some limitations about which you must be aware. These include some limitations about managing the blade server that contains IBM Director and the other blade servers in the BladeCenter chassis.

IBM Director Server running on a blade server

You can install IBM Director Server on a blade server. With this management server you can manage:

- The BladeCenter unit, including the server on which IBM Director Server is installed.
- Other BladeCenter units.

You must observe these considerations when managing the BladeCenter unit that contains the management server :

- Enable access for authorized administrators as determined by the security policy established for the user environment.
- Be careful when making changes to the configuration of the BladeCenter chassis from IBM Director itself. Such changes could effectively remove the instance of IBM Director Server from the network and halt the entire IBM Director environment.

    Specifically, do not perform these tasks on the blade server where IBM Director Server is installed without careful consideration:

    - Using Remote Deployment Manager (RDM) to deploy software to that blade server.
    - Powering off that blade server.
    - Changing the boot options on that blade server.
- Create a network setup that enables the BladeCenter Management Module to communicate with the management server. Otherwise IBM Director will be unable to discover the BladeCenter chassis that contains the management server. For details, see "Network setup for IBM Director Server running on a blade server" on page 19.

Network setup for IBM Director Server running on a blade server

By default, the blade servers installed in a BladeCenter chassis cannot communicate automatically with the management module. This architecture is designed to prevent the blade servers from modifying the BladeCenter chassis settings. If you install IBM Director Server on a blade server and want to use the instance of IBM Director to manage the BladeCenter unit in which the management server is installed, you must enable communication between the management server and the management module.

Figure 1 shows such a network configuration.
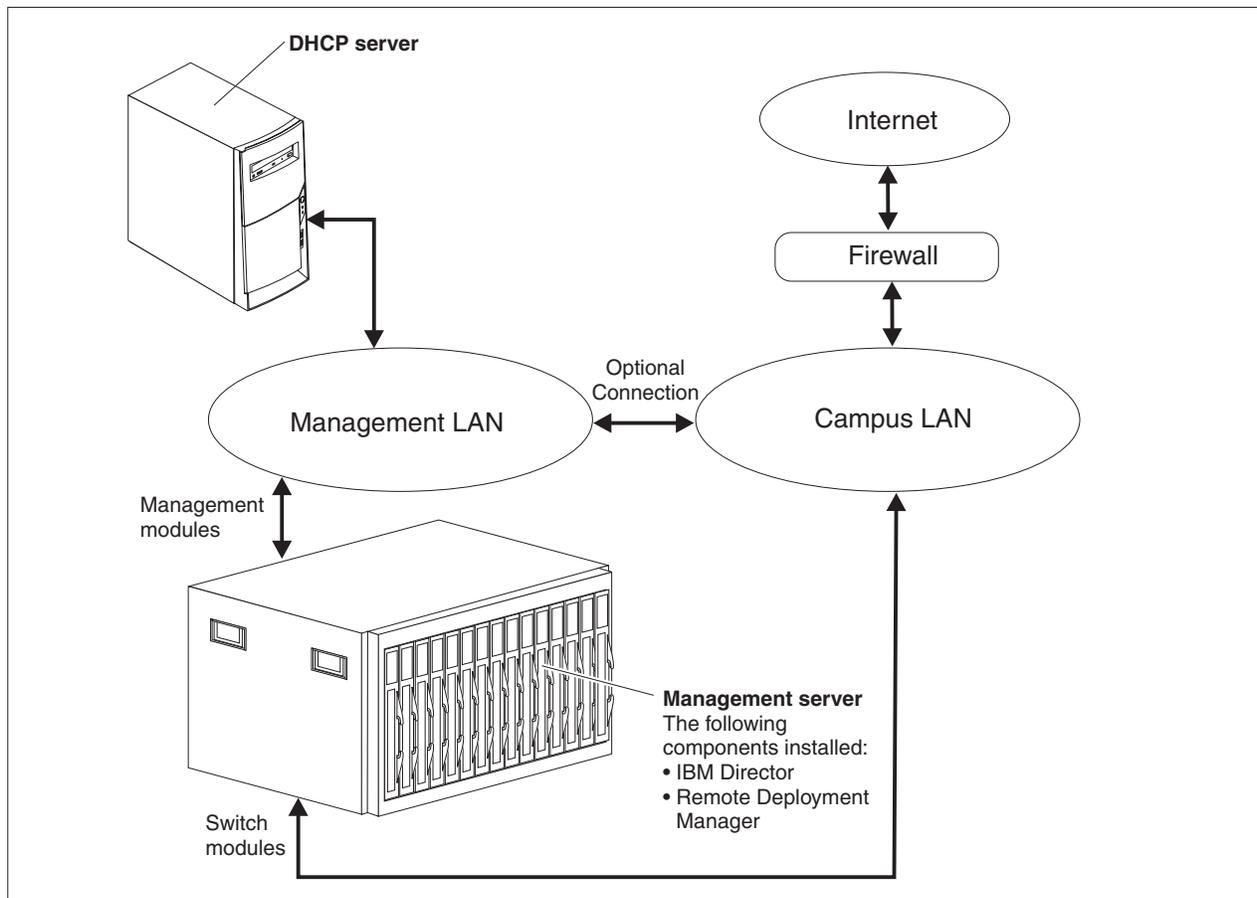
Figure 1. Example of BladeCenter deployment network when IBM Director is installed on a blade server

By enabling the communication between the Campus LAN and the Management LAN, the instance of IBM Director Server can communicate through the Campus LAN to the Management LAN and then onto the management module.

Creation of management processor objects

Starting with IBM Director 4.22 and later releases, manual addition of management processor objects will only create management processor objects for ASM PCI Adapters that have been added to servers. You cannot create management processor objects for a Remote Supervisor Adapter or a Remote Supervisor Adapter II as documented in the *IBM Director 4.20 Installation and Configuration Guide*. IBM Director adds Remote Supervisor Adapters and Remote Supervisor Adapter IIs as physical-platform managed objects.

Scalable systems and scalable partition support for xSeries 460 servers

IBM Director 4.22 adds the following support for scalable systems and scalable partitions configured on xSeries 460 servers:

- Discovery of scalable systems and scalable partitions.
- Power operations for scalable partitions.

Note: IBM Director 4.22 only performs discovery and power operations for scalable systems and scalable partitions that have been previously configured on xSeries 460 servers. It does not create or configure scalable systems or scalable partitions.

IBM Director communicates out-of-band with the service processors in xSeries 460 servers to manage hardware partitions. Each hardware partition can run a single image of the operating system and is defined as a *scalable partition* that consists of one or two xSeries 460 servers. The servers that are defined in a scalable partition have at least one SMP Expansion Module and are referred to as *scalable nodes*. A *scalable system* consists of scalable nodes and the scalable partitions that were created from those scalable nodes. These IBM Director managed objects are referred to as *scalable objects* throughout this documentation.

Understanding scalable objects

Scalable objects are IBM Director managed objects that are used with multi-node configurations of supported xSeries servers.

Scalable objects in IBM Director for xSeries 460 servers include:

- Scalable nodes
- Scalable partitions
- Scalable systems

Scalable nodes

A scalable node is a server that has one or more SMP Expansion Modules. When IBM Director discovers such a server, it creates a physical-platform managed object. It also assigns attributes that record the number of SMP Expansion Modules, SMP Expansion Ports, and RXE Expansion Ports on the physical chassis.

In IBM Director Console, scalable nodes are identified with the same icon that is used for all physical platforms. To determine whether a physical platform has the additional attributes of a scalable node, in the Group Contents pane, double-click the icon for the physical platform. The "Display System Attributes" window opens and the attributes for SMP Expansion Modules and RXE Expansion Ports are in the list that is displayed.

The following requirements apply to multi-node configurations:

- All servers in one scalable system must be of the same machine type and model, and must have the same number of SMP Expansion Modules.
- All servers in one scalable system must have the same type of service processor and the same firmware code level.
- The service processor of each server must be connected to an active network. This connection is necessary so that the service processors can communicate and perform the necessary functions for the multiple servers to merge as one

combined server or unmerge as separate servers. This connection also is required for out-of-band communication with IBM Director.

- All servers in one scalable system must be at the same basic input/output system (BIOS) code level.

Scalable partitions

A scalable partition contains one or more scalable nodes. Regardless of the number of scalable nodes it contains, a scalable partition can run a single image of an operating system.

Scalable partitions can:

- Be powered on and powered off
- Support an operating system
- Have a single, contiguous memory space and access to all associated adapters
- Identify the scalable nodes that are used by the scalable partition
- Be represented as managed systems after IBM Director Agent is installed on the scalable partition and the scalable partition is powered on.

You can view the state of a scalable partition from IBM Director Console. To do so, right-click the managed object for a scalable partition; then, click **Open** to display general attributes for that scalable partition. The scalable partition state is displayed under the general attribute State.

Furthermore, when you use the Status association in IBM Director Console, the Scalable Partition Power Status folder in the Group Contents pane includes several subcategories for scalable partition states.

Scalable systems

A scalable system is an IBM Director managed object that consists of scalable nodes and the scalable partitions that were created from the scalable nodes in the scalable system.

Attention: If you recable a multi-node server into a different physical configuration after it has been used with IBM Director, you must notify IBM Director of the recabling changes. For information, see "Reestablishing out-of-band communication after an IP address change or recabling change" on page 23.

Groups that are used with scalable objects

IBM Director provides several default groups of managed objects in the Groups pane for easier management of these objects. The default groups that are relevant to scalable objects are shown in Table 5.

Table 5. IBM Director groups that are used with scalable objects

Group name	Includes these managed objects
Logical Platforms	All logical-platform objects, which includes all scalable partitions.
Physical Platforms	All physical-platform objects, which includes all scalable nodes.
Platforms	All logical platforms and physical platforms.
Platforms and Platform Members	All logical and physical platforms and any managed systems that result from these platforms.
Scalable Partitions	Only scalable partitions.
Scalable Systems	Only scalable systems.

Table 5. IBM Director groups that are used with scalable objects (continued)

Group name	Includes these managed objects
Scalable Systems and Members	All scalable systems and all members of those scalable systems. Members of a scalable system include its scalable partitions, its scalable nodes, and any remote I/O enclosures attached to its scalable nodes. This group also includes managed systems that result from its scalable partitions.

Discovery of scalable systems and scalable partitions

When a scalable node is unlocked, IBM Director performs additional discovery for the xSeries 460 server. This discovery determines whether the NVRAM of the service processor contains a partition descriptor. If it does, IBM Director uses the partition-descriptor information to create scalable systems and scalable partitions. The partition descriptor in NVRAM was stored by the Web management interface for the xSeries 460 server.

IBM Director also creates the association between scalable systems and scalable nodes, and between scalable partitions and scalable nodes. The partition descriptor in NVRAM indicates how many scalable nodes are in a scalable system and how many scalable nodes are in a scalable partition.

The interrogation of NVRAM to locate a partition descriptor is performed in the background, in a manner similar to the discovery of physical platforms.

The following conventions are used to name the new scalable objects:

- The scalable system is named *Scalable System xxxx* where *xxxx* is the last four characters of the scalable system UUID that is read from NVRAM.
- The scalable partition is named *Scalable Partition xxxx yyyy* where *xxxx* is the last four characters of the scalable system UUID that is read from NVRAM and *yyyy* is the last four characters of the scalable partition UUID that is read from NVRAM.

Note: When more than one scalable system UUID ends with the same last four characters, this naming convention will result in duplicate names. For this reason, consider renaming automatically created scalable systems to avoid confusion.

IBM Director and out-of-band communication

IBM Director uses the communication methods provided by Management Processor Assistant (MPA) to communicate out-of-band with service processors on supported xSeries servers. For this reason, IBM Director cannot communicate out-of-band unless the following conditions are met:

- Service-processor networks must either have static IP address assignments or have Dynamic Host Configuration Protocol (DHCP) configured to maintain consistent IP addresses for the service processors. To do so, create reservations in DHCP that identify explicit IP addresses for the service processors.
- The IP addresses that are assigned to the service processors cannot change after the servers are discovered in IBM Director. This requirement is true whether you are using DHCP or statically assigning IP addresses. See "Reestablishing out-of-band communication after an IP address change or recabling change" on page 23, which describes actions to take if the IP address of a service processor has changed since it was discovered by IBM Director.

If IBM Director cannot communicate with a service processor on a supported server, use MPA to make sure that out-of-band communication with the service processor is working correctly. For more information about communicating with service processors in an IBM Director environment, see the *IBM Director 4.20 Installation and Configuration Guide*.

Reestablishing out-of-band communication after an IP address change or recabling change

If the IP address of a service processor in a server that is used in a scalable partition changes or you recable a multi-node configuration, complete the following steps to reestablish out-of-band communication with the server:

1. From IBM Director, remove the affected scalable objects:

    a. Delete the scalable system that contains the server.

    b. Delete the scalable nodes that represent the server.

2. From IBM Director Console, click **Tasks → Discover Systems → Physical Platforms** to rediscover the scalable nodes.

3. If the scalable nodes are not already unlocked, from the IBM Director Group Contents pane, right-click the scalable node and click **Request Access**.

Performing power operations

You can use IBM Director Console to power on and power off scalable partitions on xSeries 460 servers. Power operation that are performed on managed objects that represent scalable partitions use out-of-band communication. Power operations that are performed on managed-system objects created from powered-on scalable partitions use in-band communication to power off the scalable partition.

Note: The out-of-band power operations in IBM Director 4.22 are only for use by xSeries 460 servers. Other supported servers (such as xSeries 455 and xSeries 445 servers) should install and use Scalable Systems Manager (SSM) 4.20 if needed.

IBM Director Console identifies all scalable partitions with the same scalable partition icon whether they are powered on or powered off. However, IBM Director Console uses additional icons with the scalable-partition icon to indicate the state of a scalable partition.

IBM Director Console uses the same icon to depict all physical platforms, including those that are not scalable nodes and those that are not in powered-on scalable partitions.

If you have a scalable partition that can no longer be powered on or powered off, see "Problems powering on or powering off a scalable partition" on page 25.

Powering on a scalable partition

When you power on a scalable partition, the servers that are part of the scalable partition are powered on, and the operating system is started on the scalable partition. If IBM Director Agent is installed on the scalable partition, it is started also.

Before you power on a scalable partition, make sure that the primary scalable node is unlocked in IBM Director and that all scalable nodes in the scalable partition have been discovered by IBM Director.

To request access to the primary scalable node, from the Group Contents pane of IBM Director Console, right-click the physical-platform icon and click **Request**

Access. By providing a valid login ID and password that has read/write access to the service processor, you can unlock the physical platform.

Complete the following steps to power on a scalable partition:

1. From IBM Director Console, in the Group Contents pane, expand the tree structure for the scalable system that contains the scalable partition.

2. Right-click the inactive scalable partition that you want to power on; then, click **Power On**.

When IBM Director Server discovers that IBM Director Agent is running on the newly started scalable partition, it creates a managed-system object to represent the active scalable partition. You can use IBM Director to manage this managed system as you would any other managed system. For example, by using Management Processor Assistant (MPA), system administrators can configure, monitor, and manage the service processors in xSeries servers. Further, IBM Director associates the managed-system object with its scalable partition object. Use the Scalable Partitions Membership association in IBM Director Console to view a tree structure of scalable partitions and their associations with any managed systems.

Shutting down and powering off a scalable partition

When a scalable partition is powered on, you can use the IBM Director Console to shut down and power off the scalable partition. Doing so causes IBM Director to notify the operating system that the scalable partition will be shut down and powered off in one of the following ways:

- If the device driver for the service processor on the primary scalable node is available, the operating system attempts to exit from running applications before it shuts down. Then, IBM Director powers off the servers that are represented as scalable nodes.

- If the device driver for the service processor on the primary scalable node is not available, the scalable partition is immediately powered off and there is no attempt to exit from running applications. In this case, the operating system can display only a message that it is shutting down. It then flushes its disk caches before the servers that are represented as scalable nodes in the scalable partition are physically powered off. Application processes running on the system are not shut down.

Complete the following steps to shut down the operating system and power off all servers that are represented as scalable nodes:

1. From IBM Director Console, in the Group Contents pane, expand the tree structure for the scalable system that contains the scalable partition.

2. Right-click the active scalable partition that you want to power off; then, click **Shutdown and Power Off**.

3. Click **Execute Now**.

Powering off a scalable partition

When a scalable partition is powered on, you can use IBM Director Console to immediately power off the scalable partition. Doing so causes IBM Director to notify the operating system that the scalable partition will be powered off immediately. The operating system then displays a message that it is shutting down. It flushes its disk caches before the servers that are represented as scalable nodes in the scalable partition are physically powered off. Application processes that are running on the system are not shut down in an orderly way. After approximately 10 seconds, IBM Director physically powers off the server.

Alternatively, you can shut down the operating system and application processes in a more orderly way before the servers in the scalable partition are powered off. See "Shutting down and powering off a scalable partition" on page 24 for details.

Complete the following steps to immediately power off a scalable partition:

1. From IBM Director Console, in the Group Contents pane, expand the tree structure for the scalable system that contains the scalable partition.
2. Right-click the scalable partition that you want to power off; then, click **Power Off Now**.
3. Click **Execute Now**.

Problems powering on or powering off a scalable partition

Sometimes a scalable partition cannot be powered on or powered off in IBM Director Console.

Complete the following steps to resolve this symptom:

1. If you have not done so already, write down the IBM Director system names of the scalable nodes in the affected scalable partition. This information is shown in the Group Contents pane of IBM Director Console.
2. From IBM Director Console, remove the affected scalable objects:
   a. Delete the scalable system that contains the scalable partition. This action will delete the scalable partition as well.
   b. Delete the scalable nodes that were part of the scalable partition.
3. From the Web interface to the service processor on the primary server, use the Restore Defaults page to reset the service-processor configuration to the factory defaults.

   Attention: When you reset the defaults, you will lose all the modifications that you made to the service processor. You also will lose the remote control of the remote servers, which includes the IP address, login IDs, and passwords. If you had site-specific customizations, you must reconfigure them after the defaults have been restored.
4. If the affected servers are part of a service-processor network with one or more DHCP servers, make sure that DHCP is configured to maintain consistent IP addresses for the service processors.
5. From IBM Director Console, click **Tasks → Discover Systems → Physical Platforms** to rediscover the scalable objects.
6. If the scalable node is not already unlocked, from the IBM Director Group Contents pane, right-click the scalable node; then, click **Request Access**.

Storage managed objects

IBM Director 4.22 introduces support for storage managed objects, which are IBM Director managed objects that represent storage-related devices. IBM Director 4.22 provides support for storage managed objects that represent IBM TotalStorage DS4000 series storage systems.

IBM Director implements support for storage managed objects by using the Storage Management Initiative Specification (SMI-S) v1.0.2, which has been defined by the Storage Networking Industry Association (SNIA). IBM Director communicates with storage systems through their respective SMI-S providers.

Note: The SANtricity SMI Provider from Engenio is required for DS4000 series support in IBM Director 4.22. This provider complies with SMI-S version 1.0.2. Obtain this provider from the Engenio Web site http://www.engenio.com.

Storage managed objects can be used with the IBM Director Inventory task. In IBM Director 4.22, storage managed objects that represent IBM TotalStorage DS4000 series storage systems do not provide system health information.

Discovering SMI-S Storage Devices

From IBM Director Console, click **Tasks → Discover Systems → SMI-S Storage Devices** to discover storage devices supported by IBM Director.

Note: Although IBM Director Console displays storage managed objects that represent supported SMI-S storage devices, the storage managed object does not provide full common information model (CIM) data until it has been unlocked. After it has been unlocked, IBM Director can communicate with the SMI-S provider for that storage device.

To request access, from the Group Contents pane, right-click the storage managed object and click **Request Access**. By providing a valid login ID and password that has read/write access to the SMI-S provider, you can unlock the storage managed object.

The ″Discovery Preferences″ window has a new SMI-S Storage Devices tab that you can use to set discovery parameters for storage managed objects.

Creating SMI-S Storage Devices

Complete the following steps to create a storage managed object for a supported storage device:

1. 1. From IBM Director Console, in the Group Contents pane, right-click any blank space; then, click **New → SMI-S Storage Devices**. The ″Add SMI-S Storage Devices″ window opens.

Figure 2. ″Add SMI-S Storage Devices″ window

2. In the **Type** field, select the type of storage device that you want to add. IBM Director 4.22 only supports the SNIA:Array type.
3. In the **Name prefix** field, type the name for the storage managed object.
4. In the **Network Address** field, type either the IP address of the storage device or the Domain Name Service (DNS) host name. For example, type an IP address in the format xxx.xxx.xxx.xxx or type a host name similar in format to myhost.city.com.
5. In the **Namespace** field, type **Interop**, which is the namespace for the Engenio provider.
6. In the **User ID** field, type the user name for the storage device.
7. In the **Password** field, type the password for the user name that you used.
8. Click **OK**. IBM Director logs on to the management interface that is provided by the storage device and creates the applicable storage managed object.

Starting external applications for storage devices

You can use IBM Director to start external applications for targeted storage managed objects. IBM Director 4.22 supports the start of Storage Manager Client for IBM TotalStorage DS4000 series storage systems. You must install Storage Manager Client on each management console from which you plan to use it.

Before you can start Storage Manager Client from IBM Director Console on systems running a Windows operating system, you must set the following environment variables:

JAVA_FAStT
    Defines the Java Runtime Environment (JRE) directory that is associated with Storage Manager Client. The default directory on Windows operating systems is c:\Program Files\Common Files\IBM_FAStT\jre\1.4.

STORAGE_MANAGER
> Defines the working directory of Storage Manager Client. The default directory on Windows operating systems is c:\Program Files\IBM_FAStT\client.

Complete the following steps to start IBM DS4000 Storage Manager from IBM Director:

1. From IBM Director Console, in the Group Contents pane, right-click on a storage managed object.
2. Click **Launch external application → Storage Manager**.

For information about IBM DS4000 Storage Manager, see the documentation that comes with that product.

Groups that are used with storage managed objects

Table 6 lists the two new groups that have been added to IBM Director to support storage managed objects.

Table 6. IBM Director groups that are used with storage managed objects

Group name	Includes these storage managed objects
SMIS-Storage Devices	Only storage managed objects that comply with the SMI-S standard.
Storage Devices	All storage managed objects, regardless of compliance with SMI-S standards.

Appendix A. Third-party notices

This appendix includes updated third-party notices for open source components that are part of IBM Director 4.22.

The information in this appendix applies to the following third-party software:

- Apache HTTP software
- modSSL software

Notices for other third-party software that is used in IBM Director 4.22 is located in the file dir4.22_legal_readme.txt, which is included on the *IBM Director 4.22* CD in the docs\license directory.

General third-party notices

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```
/*
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 * ---------------------------------------------------------------------------
 *
 */
* For compliance with Mr Darwin's terms: this has been very significantly
 * modified from the free "file" command.
 * - all-in-one file for compilation convenience when moving from one
 *   version of Apache to the next.
 * - Memory allocation is done through the Apache API's pool structure.
 * - All functions have had necessary Apache API request or server
 *   structures passed to them where necessary to call other Apache API
 *   routines.  (i.e., usually for logging, files, or memory allocation in
 *   itself or a called function.)
 * - struct magic has been converted from an array to a single-ended linked
 *   list because it only grows one record at a time, it's only accessed
 *   sequentially, and the Apache API has no equivalent of realloc().
 * - Functions have been changed to get their parameters from the server
 *   configuration instead of globals.  (It should be reentrant now but has
 *   not been tested in a threaded environment.)
 * - Places where it used to print results to stdout now saves them in a
 *   list where they're used to set the MIME type in the Apache request
 *   record.
 * - Command-line flags have been removed since they will never be used here.
```

```
    *
    */


For the  src/modules/standard/mod_imap.c component:

  "macmartinized" polygon code copyright 1992 by Eric Haines, erich@eye.com

For the  src/main/util_md5.c component:

/***************************************************************************
 * NCSA HTTPd Server
 * Software Development Group
 * National Center for Supercomputing Applications
 * University of Illinois at Urbana-Champaign
 * 605 E. Springfield, Champaign, IL 61820
 * httpd@ncsa.uiuc.edu
 *
 * Copyright  (C)  1995, Board of Trustees of the University of Illinois
 *
 ***************************************************************************
 *
 * md5.c: NCSA HTTPd code which uses the md5c.c RSA Code
 *
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```

For the src/include/ap_md5.h component:
```
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```

```
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```

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```
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 */
```

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 */
/*
 * The p_MD5Encode() routine uses much code obtained from the FreeBSD 3.0
 * MD5 crypt() function, which is licenced as follows:
 * -----------------------------------------------------------------------------
 * "THE BEER-WARE LICENSE" (Revision 42):
 * <phk@login.dknet.dk> wrote this file.  As long as you retain this notice you
 * can do whatever you want with this stuff. If we meet some day, and you think
 * this stuff is worth it, you can buy me a beer in return.  Poul-Henning Kamp
 * -----------------------------------------------------------------------------
 */
```

For the src/lib/sdbm component:

```
 * sdbm - ndbm work-alike hashed database library
 * based on Per-Aake Larson's Dynamic Hashing algorithms. BIT 18 (1978).
 * author: oz@nexus.yorku.ca
 * status: public domain.
```

For the src/lib/expat-lite component:

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    Written by Adam Twiss (adam@zeus.co.uk). March 1996

Thanks to the following people for their input:
  Mike Belshe (mbelshe@netscape.com)
  Michael Campanella (campanella@stevms.enet.dec.com)

*/

For the expat xml parser component:

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 * Originally written by Tony Finch <fanf@demon.net> <dot@dotat.at>.
 *
 * Implementation ideas were taken from mod_alias.c. The overall
 * concept is derived from the OVERRIDE_DOC_ROOT/OVERRIDE_CGIDIR
 * patch to Apache 1.3b3 and a similar feature in Demon's thttpd,
 * both written by James Grinter <jrg@blodwen.demon.co.uk>.
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