IBM Systems

IBM Director Installation and Configuration Guide

Version 5.10

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Note

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

Fourth Edition (October 2005)

This edition applies to version 5.10 of IBM Director and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this book

This book provides information about installing and configuring IBM Director. In addition to presenting an overview of IBM Director and its requirements, it covers the following topics:

- Planning an IBM Director environment
- Installing IBM Director and IBM Director extensions
- Upgrading from IBM Director 4.2 or earlier to IBM Director 5.1
- Configuring IBM Director

It also includes information about IBM Director security and solving problems you might encounter with IBM Director.

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.

What's new

This section describes the enhancements made to IBM Director since version 4.20.

What's new in release 4.21

This topic provides information about new features and enhancements in IBM Director 4.21

IBM Director 4.21 adds the following new features, functions, and enhancements:

BladeCenter management

IBM Director 4.21 contains the following enhancements:

- BladeCenter Deployment Wizard support for the BladeCenter Telco and the Brocade Enterprise SAN Switch Module for IBM eServer BladeCenter
- Rack Manager support for the BladeCenter Telco
- Virtual Local Area Network (VLAN) configuration support for Cisco and Intel® Gigabit Ethernet Switch Modules
- Support for managing the Intelligent Platform Management Interface (IPMI) baseboard management controller in the IBM eServer BladeCenter HS20, machine type 8843 server

BladeCenter switches

IBM Director 4.21 adds support for the following BladeCenter switches:

- Infiniband Switch Module
- Nortel Networks Layer 2/3 GbE Switch Module

Database

IBM Director 4.21 adds support for using PostgreSQL, version 7.4 as the IBM Director database (SUSE LINUX Enterprise Server 9 only).

General enhancements

IBM Director 4.21 adds the following new functionality:

- Ability to launch the Web interface for service processors from IBM Director Console
- Management Information Base (MIB) files for the IBM System Storage DS300 and DS400
- Support for viewing blue-indicator light and firmware-level information for xSeries servers that contain IPMI baseboard management controllers

Linux® systems

IBM Director 4.21 adds support for the following features on managed systems running Linux:

- Alert Standard Format (ASF) 2.0 on an xSeries 306 server running a 32-bit version of Linux
- Network interface card (NIC) events

Operating systems

IBM Director 4.21 adds support for the following operating systems:

IBM Director Server and IBM Director Console

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- SUSE LINUX Enterprise Server 9 for x86

IBM Director Agent

- AIX 5L™, Version 5 Release 3
- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel EM64T
- Red Hat Enterprise Linux WS, version 3.0, for Intel EM64T
- SUSE LINUX Enterprise Server 9 for AMD64 and EM64T
- SUSE LINUX Enterprise Server 9 for IBM POWER™
- SUSE LINUX Enterprise Server 9 for Itanium Processor Family
- SUSE LINUX Enterprise Server 9 for x86

ServeRAID™ hardware and software

IBM Director 4.21 adds support for the IBM ServeRAID-7k Ultra320 SCSI controller. It also contains an updated ServeRAID Manager task, which is based on the stand-alone version of ServeRAID Manager 7.10b.

Upward integration

IBM Director 4.21 adds the following new functionality:

- Upward integration with Microsoft® Systems Management Server (SMS) 2003
- Ability to use Secure Sockets Layer (SSL) with the upward-integration modules for IBM Tivoli® NetView® and HP OpenView

For the most recent information about hardware or software support, see the *IBM Director Hardware and Software Compatibility* document. You can download the PDF file from the IBM Support Web page at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/

What's new in release 4.22

This topic provides information about new features and enhancements in IBM Director 4.22.

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
- 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.

  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.

  Refer to the *IBM Director 4.22 Release Notes* for more information.

IBM System Storage

IBM Director 4.22 adds support for IBM System Storage DS4000 series storage systems. This support is provided by new storage managed objects, which are IBM Director managed objects that represent storage-related devices.

IBM Director 4.22 also adds support for launching IBM DS4000 Storage Manager from IBM Director Console.

Refer to the *IBM Director 4.22 Release Notes* for more information.

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.

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).

Refer to the *IBM Director 4.22 Release Notes* for more information.

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 its initial release, see the *IBM Director Hardware and Software Compatibility* document. You can download the PDF file from the IBM Director support Web page at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

What's new in release 5.10

This topic provides information about new features and enhancements in IBM Director 5.10.

Improvements to how you work in IBM Director

Enhanced user interface

IBM Director 5.10 contains the following features designed to improve usability:

- Enhanced user interface allows more intuitive hierarchical viewing of managed objects in a single-pane view, the ″classic″ three-pane view, or a two-pane combination view
- New customizable details view of managed objects
- Toolbar is now customizable for users

Event Action Plan wizard

The Event Action Plan wizard now can be launched from IBM Director Console and used to edit existing event action plans. In addition, the wizard has been redesigned to improve usability and render it more powerful. You can specify additional event filters, the systems to which you want to apply the event action plan, and schedule when the event filters are applied.

Improved accessibility

IBM Director 5.10 meets the accessibility standards for Section 508 of the US Rehabilitation Act. The major changes to the product include the following:

- IBM Director Console can be navigated using the keyboard only.
- IBM Director Console includes ″Accessibility Preferences″ that enable users to customize such display attributes as color, font size, and contrast.
- IBM Director Console implements the Java accessibility API which supports interaction with assistive technology.
- The IBM Director documentation is delivered in a Web-based Information Center.

New command-line interface

The **dircmd** command-line interface is deprecated in favor of a new command-line interface: **dircli**. The **dircli** command-line interface supports existing **dircmd** bundles, plus offers a new set of commands for accomplishing common system-management tasks.

Server Configuration Manager

New task to create or update server configuration profiles. Configuration includes the service processors in @server xSeries servers.

Software Health

New task to check for outdated firmware, drivers, and director agents on managed objects.

Unattended installation

IBM Director Server now can be installed in unattended mode.

Web-based (Information Center) product documentation

New in version 5.10, the IBM Director information center is a comprehensive, browser-based information system that provides easy access to the most up-to-date product information available. Updated periodically, the IBM Director information center contains:

- Assistance for the tasks that users must perform
- Conceptual information
- Reference for commands, extensions, icons, security, and many other topics
- Usage scenarios for IBM Director

To find information, users can search, browse the contents, follow links from one topic to related topics, and print the topics they want to read offline. The IBM Director information center is available at publib.boulder.ibm.com/infocenter/eserver/v1r2/topic/diricinfo/fqm0_main.html.

Inventory enhancements

Inventory collection has been improved with the following new features in IBM Director 5.10:

- Filter queries can be designed for inventory data that has not been collected
- Enhanced tree navigation in the Inventory Query Browser
- Inventory change monitoring
- Custom collections of inventory tables
- Optional events on inventory completion or errors
- Improved control over inventory collection through additional preferences:
  - Enable/disable background inventory service
  - Specify the maximum number of agents to perform inventory collection at the same time, to control resource usage
  - Specify the default collection type for the three agent levels

Upward integration enhancements

IBM Director 5.10 includes the following enhancements to the upward integration modules (UIM):

- Support for Microsoft Operations Manager (MOM)

Support for more systems in IBM Director

SMI-S storage devices

- Support for SMI-S 1.1 compliant Storage Managed Systems, including the IBM System Storage DS300 and DS400 devices

- Information displayed in the Hardware Status task and events for all supported SMI-S storage devices

ServeRAID hardware and software

IBM Director 5.10 improves support for IBM ServeRAID controllers:

- Configuration Management Station on Linux
- Support for VMware ESX Server, versions 2.1, 2.5, and 2.51, Console
- Support for VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems
- Support for Red Hat Enterprise Linux AS, ES, and WS, version 4.0
- Support for ServeRAID Server and Console installations on EM64T and AMD64
- Hardware support for the IBM ServeRAID-8i controller
- Separate installation for the ServeRAID Manager extension

For complete support information, refer to the IBM ServerProven page at www.ibm.com/pc/us/compat/index.html.

Architectural support for more systems

IBM Director 5.10 contains a significant change in the product architecture. IBM Director Server now can manage three different types of managed systems:

Level-0 (″agentless″) managed systems

IBM Director manages these systems through the network services that are native to the operating system: SMB/CIFS/DCE-RPC protocols for Windows systems, or Secure Shell (SSH) for other systems. No IBM Director software is installed. You can perform the following tasks on these managed systems from the IBM Director Console:

- Collect inventory that is available from the operating system
- Install IBM Director Core Services (Level 1) or IBM Director Agent (Level 2)
- Reboot the operating system (Windows or Linux)
- Use Remote Session task to execute command-line programs (only if SSH is present)
- Shutdown/power-off systems (Windows)

Level-1 managed systems

IBM Director Core Services must be present. In addition to the tasks supported by Level-0 managed systems, you can perform the following tasks on these managed systems from the IBM Director Console:

- Collect platform-specific inventory
- Install IBM Director Agent (promote to Level-2 managed system)
- Manage events using event action plans, event subscription, and the event log
- Monitor hardware status
- Reboot or shutdown the managed system
- Use Remote Session task to execute command-line programs (only if SSH is present)
- Distribute system-level update packages

Level-2 managed systems
IBM Director Agent must be installed. You can perform the full complement of IBM Director tasks on the managed system.

Additional systems supported for IBM Director Server and IBM Director Console installation

xSeries servers

- Red Hat Enterprise Linux AS and ES, version 4.0, for AMD64 and EM64T
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- SUSE LINUX Enterprise Server 9 for AMD64 and EM64T
- Windows Server 2003, Enterprise, Standard, and Web x64 Editions

iSeries™ servers

- AIX 5L, Version 5.3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System p5 and pSeries servers

- AIX 5L, Version 5.3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System z9 and zSeries servers

- 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

Additional systems supported for IBM Director Agent installation

xSeries servers and Intel-compatible systems (32-bit operating systems)

- Novell NetWare, version 6.5
- VMware ESX Server, version 2.5, with the following guest operating systems:
  - Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 3 required)
  - SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
  - SUSE LINUX Enterprise Server 9 for x86
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
  - Windows XP Professional Edition (Service Packs 1 and 2 required)
- VMware ESX Server, version 2.51, with the following guest operating systems:
  - Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 4 required)
  - SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
  - SUSE LINUX Enterprise Server 9 for x86 (Service Pack 1 required)
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required)

  - Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
  - Windows XP Professional Edition (Service Packs 1 and 2 required)
- Microsoft Virtual Server 2005 with the following guest operating systems:
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or 4 required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions
- Microsoft Virtual Server 2005 (Service Pack 1) with the following guest operating systems:
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or 4 required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions
  - Windows Server 2003, Enterprise, Standard, and Web x64 Editions
  - Windows XP Professional Edition (Service Pack 2 required)
  - Windows XP Professional x64 Edition

xSeries servers and Intel-compatible systems (64-bit operating systems)

- Red Hat Enterprise Linux AS, version 4.0, for Intel Itanium
- Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions
- Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions

iSeries servers

- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER

iSeries servers with xSeries options

iSeries server installations can use the following xSeries options:

- Integrated xSeries Server (ISX)
- xSeries servers that are attached to the iSeries servers via the Integrated xSeries Adapter (IXA)

Using these xSeries options, you can install IBM Director Agent and IBM Director Core Services on the following operating systems:

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 9 for x86
- Windows 2000, Advanced Server and Server Editions
- Windows Server 2003, Enterprise, Standard, and Web Editions

Note: Whether these operating systems are supported in your iSeries environment depends on the following criteria:

- The Integrated xSeries Server (ISX) installed in the iSeries server
- The xSeries server that is attached to the iSeries server via the Integrated xSeries Adapter (IXA)
- The release of i5/OS or OS/400 installed on the iSeries server

For more information, see *IBM Director Hardware and Software Compatibility*. You can download this document from www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

System p5 and pSeries servers

- Red Hat Enterprise Linux AS, version 3.3, for IBM POWER
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER

System z9 and zSeries servers

- 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

z/VM® Center management

z/VM Center is a new extension for provisioning Linux systems on virtual hardware that is based on real IBM System z9 and zSeries hardware and the z/VM hypervisor. z/VM Center provides two tasks:

Virtual Server Deployment

- Create and maintain templates for virtual hardware.
- Create and maintain templates for Linux systems.
- Create and delete virtual hardware.
- Create and delete instances of the Linux operating system.

Server Complexes

- Use the templates from Virtual Server Deployment to create virtual hardware and Linux instances on this hardware in a single step.
- Manage configurations of Linux instances and virtual hardware. Configuration domains include network settings, Linux configuration scripts, disk access, and VM Resource Manager (VMRM) performance goals.
- Apply configuration changes across multiple Linux instances.

Security enhancements

Security

IBM Director security has been improved with the following changes:

- AES support for UDP encryption
- Auditing on the server
- For new installations, security settings, including console-server SSL, are on or selected by default
- On Windows only, group administration of privileges
- PAM authentication support on UNIX®
- User-authenticated **dircli** command-line interface to replace **dircmd**

Other enhancements

IBM Director 5.10 includes the following general enhancements:

- Apache Derby is now the default IBM Director database that is bundled with the product. It is supported on all the operating system on which IBM Director Server can be installed, with the exception of i5/OS.
- Changed the name of the default group ″All Systems and Devices″ to ″All Managed Objects″; this group now has a default association, ″System Membership,″ that associates systems with their platforms.

- Replace the timestamp on the status bar with the number of managed objects displayed in the Group Contents pane
- Support for IBM Java Runtime Environment (JRE) 1.4.2, server release 2
- User-selected associations are persisted per group

Discontinued features in release 5.10

BladeCenter management

The BladeCenter Assistant task has been replaced with the BladeCenter Management task.

DMI Browser

The DMI Browser task has been removed.

Management Processor Assistant task

The Management Processor Assistant task has been replaced by the new Server Configuration Manager task.

Microsoft Management Console (MMC)

Microsoft Management Console (MMC) is no longer supported as of release 5.10.

Server Plus Pack

The Server Plus Pack has been withdrawn; however, some of its components are still available:

- Capacity Manager is separately available for purchase for IBM @server xSeries systems
- Rack Manager is now part of the base installation of IBM Director
- System Availability is available from the IBM Web site as a separate, installable extension

Active PCI Manager and Software Rejuvenation are not supported in release 5.10, and if installed for a previous version of IBM Director, they will be uninstalled when IBM Director is upgraded to version 5.10.

Web-based Access

Web-based Access has been removed from the base installation of IBM Director. It is available from the IBM Web site as a separate, installable extension.

Chapter 1. Getting started with IBM Director

This topic contains general and conceptual information about IBM Director.

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.

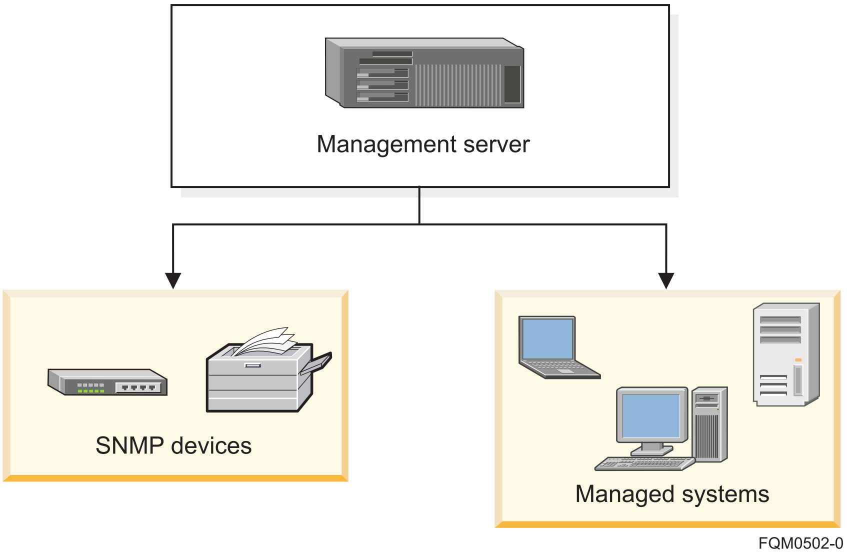


Figure 1. Hardware in an IBM Director environment

IBM Director components

This topic provides information about the IBM Director components.

The IBM Director software has four components:

- IBM Director Core Services
- IBM Director Agent
- IBM Director Console
- IBM Director Server

IBM Director may also manage some systems on which no component of IBM Director is installed. Such managed systems are referred to as *Level-0 managed systems*. These systems must at a minimum support either the Secure Shell (SSH) or Distributed Component Object Model (DCOM) protocol.

Note: When you install IBM Director Server on Microsoft Windows or Linux, IBM Director Agent and IBM Director Console are installed automatically also. When you install IBM Director Server on IBM i5/OS, IBM Director Agent is installed automatically also.

Figure 2 on page 3 shows where the IBM Director software components are installed in a basic IBM Director environment.

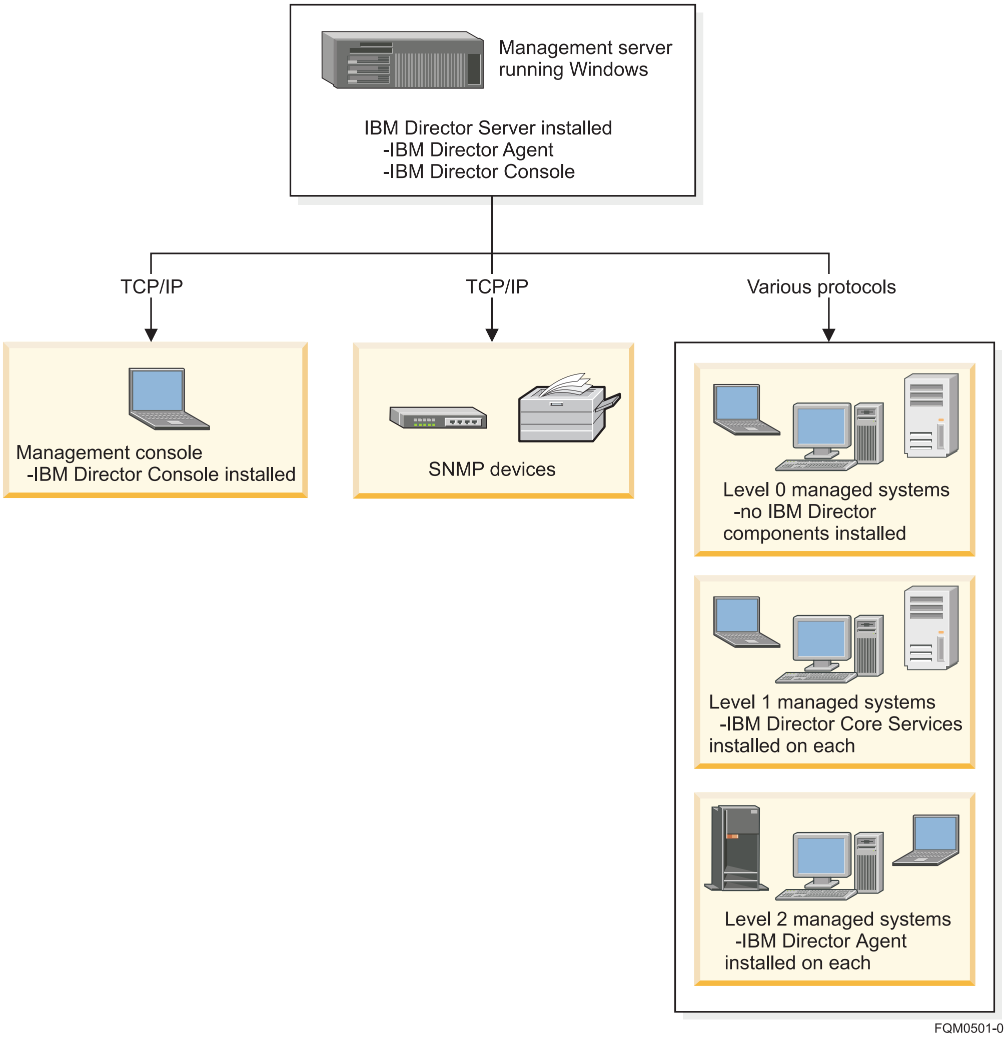


Figure 2. Software in an IBM Director environment

IBM Director Core Services

IBM Director Core Services is installed on a managed system to provide hardware-specific (Level-1) functionality for IBM Director to communicate with and administer the managed system.

IBM Director Core Services provides a subset of IBM Director Agent functionality that is used to communicate with and administer the managed system. Systems (IBM servers, desktop computers, workstations, and mobile computers) that have IBM Director Core Services (but not IBM Director Agent) installed on them are referred to as *Level-1 managed systems*.

IBM Director Core Services provides management entirely through standard protocols. This includes discovery, authentication, and management. The IBM Director Core Services package installs an SLP service agent, an SSL-enabled CIMOM (on Linux) or CIM mapping libraries to WMI (on Windows), an optional ssh server, and platform-specific instrumentation.

You can perform the following tasks on a Level-1 managed system:

- Collect inventory.
- Promote to Level-2 management by distributing the IBM Director Agent package.
- Manage events using event action plans, event subscription, and the event log.
- Monitor hardware status.
- Reboot or shut down the managed system.
- Run command-line programs.
- Distribute system update packages through Software Distribution
- Remote Session (requires ssh)

IBM Director Agent

IBM Director Agent is installed on a managed system to provide enhanced (Level 2) functionality for IBM Director to communicate with and administer the managed system.

IBM Director Agent provides management data to IBM Director Server. Data can be transferred using several network protocols, including Transmission Control Protocol/Internet Protocol (TCP/IP), Network Basic Input/Output System (NetBIOS), and Internetwork Package Exchange (IPX). IBM Director Server can communicate with all systems in your network that have IBM Director Agent installed.

IBM Director Agent features vary according to the operating system on which IBM Director Agent is installed. For example, you can install Web-based Access only on Windows 32-bit operating systems.

All IBM @server Intel-compatible servers, IBM @server JS20 blade servers, IBM NetVista desktop computers, IBM ThinkCentre desktop computers, IBM PC desktop computers, IBM IntelliStation workstations, IBM ThinkPad mobile computers, IBM System Storage Network Attached Storage (NAS) products, and IBM SurePOS™ point-of-sale systems include a license for IBM Director Agent. You can purchase additional licenses for non-IBM systems.

IBM Director Agent is supported on systems that are running the following operating systems:

- Microsoft Windows
- Linux (xSeries, POWER, System z9, zSeries)
- IBM AIX®
- IBM i5/OS
- Novell NetWare

Systems (IBM or non-IBM servers, desktop computers, workstations, and mobile computers) that have IBM Director Agent installed on them are referred to as *Level 2 managed systems*.

The functionality of IBM Director Agent on the managed system will vary depending on the operating system and platform.

IBM Director Console

IBM Director Console is installed on a desktop computer, workstation, or mobile computer to provide a GUI in which the system administrator can perform tasks in IBM Director.

IBM Director Console is the GUI for IBM Director Server. Data is transferred between IBM Director Console and IBM Director Server through TCP/IP. Using IBM Director Console, you can conduct comprehensive systems management using either a drop-and-drag action or a single click.

You may install IBM Director Console on as many systems as needed. IBM Director includes an unlimited-use license for IBM Director Console. The system on which IBM Director Console is installed is referred to as a *management console*.

Note: When you install IBM Director Console on a system, IBM Director Agent is not installed automatically. To provide full management of the management console through IBM Director, IBM Director Agent should also be installed.

IBM Director Server

IBM Director Server must be installed on the management server, and provides all the management functionality of IBM Director.

IBM Director Server is the main component of IBM Director; it contains the management data, the server engine, and the application logic. IBM Director Server provides basic functions such as discovery of managed objects, persistent storage of configuration and management data, an inventory database, event listening, security and authentication, management console support, and administrative tasks.

IBM Director Server stores the inventory data in a Structured Query Language (SQL) database. You can access information that is stored in this relational database even when the managed objects are not available.

Every IBM xSeries server and @server BladeCenter unit comes with an IBM Director Server license. You can purchase additional IBM Director Server licenses for installation on non-IBM servers.

IBM Director Server communicates with managed objects and SNMP devices to receive information and issue commands. If IBM Director Console is used, IBM Director Server communicates with IBM Director Console to display network status information and receive instructions from the system administrator.

Concepts

This section discusses concepts that will help you understand how IBM Director works. Becoming familiar with the IBM Director components and understanding the concepts in this section enables you to use IBM Director most effectively.

Accessibility

This topic describes the accessibility features in IBM Director.

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. These are the major accessibility features in IBM Director:

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

Keyboard shortcuts

You can use keys or key combinations to perform operations that can also be done through mouse actions.

Keyboard shortcuts for windows, frames, panes, and icons:

You can use keys or key combinations to navigate windows, frames, panes, and icons in the IBM Director Console interface.

Window

Action	Keyboard shortcut
Activate the default button.	Enter

Option pane

Action	Keyboard shortcut
Navigate in or out of the option pane.	Alt+F6
Hide a dialog.	Esc
Active the default button (if defined).	Enter

Dialog

Action	Keyboard shortcut
Navigate out of the dialog.	Alt+F6
Hide the dialog.	Esc
Active the default button (if defined).	Enter

Scroll pane

Action	Keyboard shortcut
Navigate forward out of the scroll pane.	Tab
Navigate backward out of the scroll pane.	Shift+Tab
Move up or down.	Up arrow or down arrow
Move left or right.	Left arrow or right arrow.
Navigate to the beginning or end of data.	Ctrl+Home or Ctrl+End
Navigate up or down one block.	PgUp or PgDn
Navigate to the left or right.	Ctrl+PgUp or Ctrl+PgDn

Split pane

Action	Keyboard shortcut
Navigate forward out of the split pane.	Tab or Ctrl+Tab
Navigate backward out of the split pane.	Shift+Tab or Ctrl+Shift+Tab
Navigate between split panes.	Tab or F6
Navigate to the splitter bar.	F8

Action	Keyboard shortcut
Toggle the focus between two split bars (for windows with three split panes).	F8
Resize the split pane vertically.	Up arrow or down arrow
Resize the split pane horizontally.	Left arrow or right arrow
Maximize the size of the split pane .	Home
Minimize the size of the split pane.	End

Notebook (tabbed pane)

Action	Keyboard shortcut
Navigate into the tabbed pane.	Tab
Navigate out of the tabbed pane.	Ctrl+Tab
Navigate to the left or right tab.	Left arrow or right arrow
Navigate to the tab above or below.	Up arrow or down arrow
Navigate from the tab to the page.	Enter or Ctrl+Down
Navigate from the page to the tab.	Ctrl+Up
Navigate to the previous or next page.	Ctrl+PgUp or Ctrl+PgDn

Frame

Action	Keyboard shortcut
Display a window menu.	Alt+Spacebar
Active the default button (if defined).	Enter

Internal frame

Action	Keyboard shortcut
Open or restore the frame.	Ctrl+F5, Alt+F5, or Enter
Close the frame.	Ctrl+F4 or Alt+F5
Move the frame.	Ctrl+F7 or Alt+F7
Resize the frame.	Ctrl+F8 or Alt+F8
Minimize the frame size.	Ctrl+F9 or Alt+F9
Display a window menu.	Alt+Spacebar
Active the default button (if defined).	Enter

Keyboard shortcuts for the menu bar and toolbar:

You can use keys or key combinations to navigate standard controls in the IBM Director Console interface.

Menu bar

Action	Keyboard shortcut
Jump to the menu bar.	Alt or F10

Action	Keyboard shortcut
Navigate out of the menu bar.	Esc or Alt
Navigate within the menu bar.	Arrow keys
Select the next or previous menu item.	Right arrow or left arrow
Activate the default or selected item.	Enter
Display a menu.	Use one of these keyboard shortcuts: • Up arrow • Down arrow • Enter • Spacebar • Alt+Character accelerator key (if defined)
Hide a menu.	Esc or Alt

Menu

Action	Keyboard shortcut
Display a menu.	Enter or F10
Display a submenu.	Right arrow
Navigate to the next item or wrap to the top.	Down arrow
Navigate to the previous item or wrap to the bottom.	Up arrow
Hide the menu.	Esc
Hide the submenu.	Left arrow
Active the default or selected item.	Enter

Menu items

Action	Keyboard shortcut
Navigate in or out of a menu.	Arrow keys
Activate an item.	Enter, spacebar, or Alt+Character accelerator key (if defined)
Display a submenu.	Right arrow
Hide a submenu.	Left arrow or Esc

Check box menu items

Action	Keyboard shortcut
Navigate in or out of the check box menu.	Arrow keys
Select or clear a check box menu item.	Enter
Hide a check box menu.	Enter

Radio button menu items

Action	Keyboard shortcut
Navigate in or out of a radio button menu.	Arrow keys
Select or clear a radio button menu item.	Enter
Hide a radio button menu.	Enter

Pop-up menus

Action	Keyboard shortcut
Display a pop-up menu.	Shift+F10
Display a pop-up submenu.	Right arrow
Hide a pop-up menu.	Esc
Hide a submenu.	Left arrow
Navigate within a pop-up menu.	Up arrow or down arrow
Activate a pop-up menu item.	Enter or spacebar

Toolbar

Action	Keyboard shortcut
Navigate forward out of the toolbar.	Tab
Navigate backward out of the toolbar.	Shift+Tab
Navigate within the toolbar.	Arrow keys
Active a toolbar item.	Enter
Display the Customized Toolbar menu (when focus is on an icon on the main IBM Director Console window toolbar).	Shift+10

Tool tips

Action	Keyboard shortcut
Display a tool tip.	Ctrl+F1
Hide a tool tip.	Esc or Ctrl+F1

Keyboard shortcuts for standard interface controls:

You can use keys or key combinations to navigate standard controls in the IBM Director Console interface.

Buttons

Action	Keyboard shortcut
Navigate forward.	Tab
Navigate backward.	Shift+Tab
Activate the default button.	Enter

Action	Keyboard shortcut
Activate any button	Spacebar or Alt+Character accelerator key (if defined).
Activate Cancel or Close.	Esc

Check boxes

Action	Keyboard shortcut
Navigate forward.	Tab
Navigate backward.	Shift+Tab
Navigate within a group.	Arrow keys
Select or clear a check box.	Spacebar

Radio buttons

Action	Keyboard shortcut
Navigate forward.	Tab
Navigate backward.	Shift+Tab
Navigate within a group.	Arrow keys **Note:** To select the radio button, navigate to it.
Select or clear a radio button.	Spacebar

Combination boxes

Action	Keyboard shortcut
Navigate forward out of the combination box.	Tab
Navigate backward out of the combination box.	Shift+Tab
Display the drop-down list.	Alt+Down arrow
Hide the drop-down list.	Esc or Alt+Up arrow
Active the selected menu item.	Enter
Navigate up or down the drop-down list.	Alt+Up arrow or Alt+Down arrow
Navigate to a list item without selecting it.	Initial character of the list item
Move up or down the drop-down list.	Up arrow or down arrow

Lists

Action	Keyboard shortcut
Navigate forward out of the list.	Tab
Navigate backward out of the list.	Shift+Tab
Activate the selected list item.	Enter
Navigate within the list.	Up arrow or down arrow
Navigate to the beginning or end of the list.	Ctrl+Home or Ctrl+End
Select all list items.	Ctrl+A

Action	Keyboard shortcut
Select a single list item	Spacebar **Note:** Using the spacebar clears the previous selection.
Select an additional list item.	Ctrl+Spacebar
Select a range of list items.	Shift+Spacebar
Extend the selection up or down one item.	Shift+Up arrow or Shift+Down arrow
Extend the selection to the top or bottom of the list.	Shift+Home or Shift+End
Extend the selection up or down one block.	Shift+PgUp or Shift+PgDn
Navigate up or down a block.	PgUp or PgDn

Sliders

Action	Keyboard shortcut
Navigate forward out of the slider.	Tab
Navigate backward out of the slider.	Shift+Tab
Increase the value	Up arrow or right arrow.
Decrease the value	Down arrow or left arrow.
Set the maximum value.	Home
Set the minimum value.	End
Increase the value by a set range.	PgUp
Decrease the value by a set range.	PgDn

Tables

Action	Keyboard shortcut
Navigate forward out of the table.	Ctrl+Tab
Navigate backward out of the table.	Ctrl+Shift+Tab
Navigate to the next cell.	Tab or right arrow
Navigate to the previous cell.	Shift+Tab or left arrow
Navigate to the next row from the last column.	Tab or right arrow
Navigate to the previous row from the first column.	Shift+Tab or left arrow
Navigate vertically to the next or previous block.	PgUp or PgDn
Navigate horizontally to the left or right one block.	Ctrl+PgUp or Ctrl+PgDn
Navigate to the first or last cell in the row.	Home or End
Navigate to the first or last cell in the table.	Ctrl+Home or Ctrl+End
Select all cells in the table.	Ctrl+A

Action	Keyboard shortcut
Clear the current selection.	Use one of these keyboard shortcuts: • Up arrow or down arrow • Ctrl+Up arrow or Ctrl+Down arrow • PgUp or PgDn • Ctrl+PgUp or Ctrl+PgUp • Home or End • Ctrl+Home or Ctrl+End
Extend the selection up or down one row.	Shift+Up arrow or Shift+Down arrow
Extend the selection to the right or left one column.	Shift+Left arrow or Shift+Right arrow
Extend the selection to the beginning or end of the row.	Shift+Home or Shift+End
Extend the selection up or down one block.	Shift+PgUp or Shift+PgDn
Extend the selection left or right one block.	Ctrl+Shift+PgUp or Ctrl+Shift+PgDn
Extend the selection to the beginning or end of the column.	Ctrl+Shift+Home or Ctrl+Shift+End
Edit the cell without overriding the existing text.	F2
Delete the cell text before editing.	Esc

Trees

Action	Keyboard shortcut
Navigate forward out of the tree.	Tab
Navigate backward out of the tree.	Shift+Tab
Expand the entry	Right arrow or Enter (if collapsed).
Collapse the entry	Left arrow or Enter (if expanded).
Navigate up or down one entry.	Up arrow or down arrow
Navigate to the first entry in the tree.	Home
Navigate to the last visible entry in the tree.	End
Navigate vertically up or down one block.	PgUp or PgDn
Navigate to the left or right one block.	Ctrl+PgUp or Ctrl+PgDn
Select all entries.	Ctrl+A or Ctrl+Slash
Clear the selection.	Ctrl+\
Select a single entry.	Ctrl+Spacebar
Select a range of entries.	Shift+Spacebar
Extend the selection up or down one block.	Shift+PgUp or Shift+PgDn
Extend the selection to the top of the tree.	Shift+Home
Extend the selection to the bottom of the tree.	Shift+End

Keyboard shortcuts for text components:

You can use keys or key combinations to navigate text components in the IBM Director Console interface.

Text fields

Action	Keyboard shortcut
Navigate into the text field	Alt+Character accelerator key (if defined).
Navigate forward out of the text field.	Tab
Navigate backward out of the text field.	Shift+Tab
Navigate to the previous or next character.	Left arrow or right arrow
Navigate to the previous or next word.	Ctrl+Left arrow or Ctrl+Right arrow
Navigate to the beginning or end of a field.	Home or End
Submit an entry.	Enter
Select all text in the field.	Ctrl+A
Clear the selection.	Arrow keys
Extend the selection to the left or right one character.	Shift+Left arrow or Shift+Right arrow
Extend the selection to the beginning or end of the field.	Shift+Home or Shift+End
Extend the selection to the next or previous word.	Ctrl+Shift+Left arrow or Ctrl+Shift+Right arrow
Copy the selected text.	Ctrl+C
Cut the selected text.	Ctrl+X
Paste from the clipboard.	Ctrl+V
Delete the previous or next character	Backspace or Delete

Text panes

Action	Keyboard shortcut
Navigate into the text pane	Tab or Alt+Character accelerator key (if defined).
Navigate forward out of the text pane.	Ctrl+Tab
Navigate backward out of the text pane.	Ctrl+Shift+Tab
Navigate vertically up or down one block.	PgUp or PgDn
Navigate up or down one line.	Up arrow or down arrow
Navigate to the left or right one component or character.	Left arrow or right arrow
Navigate to the beginning or end of a line.	Home or End
Navigate to the previous or next word.	Ctrl+Left arrow or Ctrl+Right arrow
Navigate to the beginning or end of the text pane.	Ctrl+Home or Ctrl+End
Navigate up or down one block.	PgUp or PgDn
Navigate to the left or right one block.	Ctrl+PgUp or Ctrl+PgDn
Navigate to the next or previous HTML link or other focusable element.	Ctrl+T or Ctrl+Shift+T
Navigate out of a focusable element that accepts a tab.	Ctrl+Tab or Ctrl+Shift+Tab

Action	Keyboard shortcut
Activate a hyperlink.	Ctrl+Spacebar
Extend the selection up or down one block.	Shift+PgUp or Shift+PgDn
Extend the selection to the left or right one block.	Ctrl+Shift+PgUp or Ctrl+Shift+PgDn
Extend the selection up or down one line.	Shift+Up arrow or Shift+Down arrow
Extend the selection to the left or right.	Shift+Left arrow or Shift+Right arrow
Extend the selection to the beginning or end of the line.	Shift+Home or Shift+End
Extend the selection to the beginning or end of the text pane.	Ctrl+Shift+Home or Ctrl+Shift+End
Extend the selection to the previous or next word.	Ctrl+Shift+Left arrow or Ctrl+Shift+Right arrow
Extend the selection vertically up or down one block.	Shift+PgUp or Shift+PgDn
Extend the selection to the left or right one block.	Ctrl+Shift+PgUp or Ctrl+Shift+PgDn
Select all text in the text pane.	Ctrl+A
Clear the selection.	Arrow keys
Copy the selected text.	Ctrl+C
Cut the selected text.	Ctrl+X
Paste from the clipboard.	Ctrl+V
Delete the previous or next component or character.	Backspace or Delete
Insert a line break.	Enter
Insert a tab.	Tab

Configuring IBM Director Console appearance

The Appearance Preferences page enables you to customize the look of your IBM Director Console. You can set the color for text, backgrounds, and links. You can choose a background image and decide whether to show a shadow.

Complete the following steps to customize the background for IBM Director Console:

1. On the IBM Director Console window, select **Options** → **Console Preferences**.
2. On the Console Preferences window, click the **Appearance** tab.
3. Select the text and background colors for IBM Director Console GUI components. You can also select shadow settings and a background image.
4. Click **OK**.

Configuring IBM Director Console colors and fonts

The Accessibility Preferences page allows you to customize your IBM Director Console colors and fonts.

Note:

- If you change the **Accessibility Preferences** while other windows are visible, the window might not be displayed correctly after the change. If this occurs, close and reopen the particular window to fix the problem.

- Operating System changes in font, color and size can be reflected in both the title bar and the client area of the application. IBM Director Console settings for font size and color affect only the client area of the application.

To customize your IBM Director Console colors and fonts, complete the following steps:

1. On the IBM Director Console window, select **Options** → **Console Preferences**.
2. On the Console Preferences window, click **Accessibility Preferences**.
3. Select the color and font settings that you want.
4. Click **OK**.

Associations

Associations change the organization of a group of managed objects that is displayed in the Group Contents pane.

You can apply an association type to the group that is currently displayed in the Group Contents pane. When you apply an association, the association persists the next time you display that group.

If the group that is currently displayed in the Group Contents pane contains managed objects that do not apply to the selected association, those objects appear in blue type under the “Not Associated” node.

You also can display additional information about the managed objects that are displayed in the Group Contents pane by selecting one or more association options from the bottom half of the **Associations** menu. For example, you can view managed objects to which event action plans have been applied. If a managed object has an event action plan applied to it, the managed object is displayed as a tree structure that you can expand to view which event action plans have been applied to the object.

Association type

The following associations are available:

None

System Membership
Shows the relationship between Level-0, Level-1, and Level-2 managed systems and logical and physical platforms, with systems the top level and the associated platforms as child nodes. This is the default association for the All Managed Objects group.

Object Type
Shows the managed objects based on object type (such as managed systems, SNMP devices, and chassis).

TCP/IP Addresses
Shows the managed objects based on TCP/IP address.

TCP/IP Host Names
Shows the managed objects based on TCP/IP host names.

IPX Network IDs
Shows the managed objects based on network IDs.

Domains/Workgroups
Shows the managed objects based on domains and workgroups.

Chassis Membership
Shows all the blade servers in a BladeCenter chassis. This is the default association for the Chassis and Chassis Members group.

Cluster Membership
This is the default association for the Clusters and Cluster Members group.

Physical Platform–Remote I/O Enclosures
Shows the managed objects based on remote input/output (I/O) enclosures.

Platform Membership
Shows the relationship between managed systems and platforms, with platforms the top level and the associated systems as child nodes. This association is useful if you have a single system that represents multiple managed objects. Depending on the IBM Director task you want to perform, the managed object that you target might differ. This is the default association for the Platforms and Platform Members group.

Rack Membership
Shows all the managed objects in a rack. This is the default association for the Racks with Members group.

Scalable Partitions Membership
This is the default association for the Scalable Partitions group.

Scalable Systems Membership
This is the default association for the Scalable Systems and Members group.

TCP/IP Routers/DNS
Shows the managed objects based on TCP/IP routers or domain name space (DNS).

Status Shows the managed objects based on status.

SNMP System Object ID
Shows the managed objects based on SNMP system object ID.

HMC Membership
This is the default association for the HMC and HMC Members group.

z/VM Server Complexes Membership
Shows all z/VM systems with their server complexes, with included Linux guest systems. At the top level, the association shows the z/VM systems. Under each z/VM system, it shows the server complexes. Under each server complex, the association shows the tiers in that server complex. Under each tier, the association shows the Linux guest systems in that tier. The association also includes a “Free systems” node (at the second level) for Linux guest systems in the z/VM system that are not in any server complex.

Linux on System z9 and zSeries Platform Membership
Shows all discovered Level-0, Level-1, and Level-2 managed Linux systems that run on a System z9 or zSeries mainframe. The association tree shows which Linux systems run natively in a logical partition (LPAR) and which of the other Linux systems run under which z/VM system. Linux systems that run under an unknown z/VM system are grouped accordingly.

The association also shows z/VM manageability access points. A *z/VM manageability access point* is a Linux system that has been set up to enable the z/VM Center task for a particular z/VM system. In the association tree, z/VM manageability access points appear twice, as a Linux system under a z/VM system and as the z/VM manageability access point for that z/VM system.

Systems that are not below the LPAR or z/VM subtrees cannot be associated with an LPAR or a z/VM system, possibly because they are not Linux on System z9 and zSeries systems or because they are locked.

Default associations

The None association is the default association for most groups. This table shows the groups that have default associations other than None:

Table 1. Default associations other than None

Group	**Default association**
All Systems and Devices	System Membership
Chassis and Chassis Members	Chassis Membership
Clusters and Cluster Members	Cluster Membership
HMC and HMC Members	HMC Membership
Platforms and Platform Members	Platform Membership
Racks with Members	Rack Membership
Scalable Partition	Scalable Partitions Membership
Scalable Systems and Members	Scalable Systems Membership

Association options

The following association options are available:

Software Packages
Shows which software packages, if any, have been delivered to the managed objects in the group using the Software Distribution task.

Jobs Shows all tasks, if any, that are scheduled to be run against the managed objects in the group.

Activations
Shows all tasks, if any, that have already been run against each managed object in the group.

Resource Monitors
Shows the resource monitors, if any, that have been applied to the managed objects in the group.

Event Action Plans
Shows the event action plans, if any, that have been applied to the managed objects in the group.

Common Information Model

The Common Information Model (CIM) is a language-independent programming model that defines the properties, operations, and relationships of objects in enterprise and Internet environments. Using the CIM, IBM Director has a single model for communicating with these different resources. IBM Director uses the CIM to access data on Level-1 and Level-2 managed systems.

The CIM and Web Based Enterprise Management (WBEM) are standards that are developed by a consortium of major hardware and software vendors (including IBM) called the Distributed Management Task Force (DMTF). The CIM provides the framework by which a system can be managed by using common building blocks rather than proprietary software. If a device is CIM-compliant, software that is also CIM-compliant, such as IBM Director, can manage that device.

The infrastructure used by IBM Director for CIM instrumentation consists of the following:

CIM Client
: The CIM Client is a management application that uses CIM to manage devices. A CIM Client can reside anywhere in the network, because it uses HTTP to talk to CIM Object Managers and Agents.

CIM Managed Object
: A CIM Managed Object is a hardware or software component that can be managed by a management application by using CIM. When Level 2: IBM Director Agent or Level 1: Core Services is installed on a system, the applicable CIM software is installed and that system becomes a CIM Managed Object.

CIM Object Manager
: The CIM Object Manager (CIMOM), also known as a CIM server, is the software entity that receives, validates, and authenticates the CIM requests from the CIM Client. It then directs the requests to the appropriate component or device provider.

IBM Director locates the CIMOM through discovery. When Level 1: Core Services is installed on a system, the CIMOM registers itself to the SLP and supplies its location, IP address, port number, and the type of service that it provides (management.software.IBM:director-agent). When IBM Director performs an SLP discovery, the IBM Director SLP service is identified and the system running that service is displayed as a Level-1 managed system. With this information, IBM Director can directly communicate with the CIMOM. Director discovers the CIMOM on Level-2 managed system using a proprietary protocol.

Using CIM as the framework, IBM Director can perform tasks on the managed system. As requests arrive, the CIMOM validates and authenticates each request. It then directs the requests to the appropriate functional component of the CIMOM or to a device provider. The provider makes calls to a device-unique programming interface on behalf of the CIMOM to satisfy the IBM Director requests.

Shortcuts to CIM classes and methods

By creating *shortcuts*, or subtasks, you can bypass navigating through the class tree to reach a specific class or method. You can define two types of shortcuts:

- A *user-selected class* that displays the instances, properties, and methods that are associated with a specified class on the selected managed system.
- A *user-selected method* that runs on the selected managed system.

Default CIM subscriptions for IBM Director Core Services

This topic provides conceptual information about the default CIM subscriptions for IBM Director Core Services.

The Level-1 managed system event architecture is governed by the WBEM suite of standards as implemented by the Pegasus CIM Object Manager version 2.5. This event architecture includes indication providers, indication handlers, and indication consumers.

Indication providers
Software modules managed by the CIMOM that monitor a resource in a computer system and send indications when some threshold has been exceeded for that resource.

Indication handlers
Software modules managed by the CIMOM which can export the indication to an interested subscriber.

Indication consumers
Software modules that subscribe to the CIM indications in which they are interested.

No indications are forwarded by the CIMOM unless there is an interested subscriber.

Level-1 IBM Director Core Services installs the following types of indication providers, indication handlers, and indication consumers:

- Indication providers that monitor hardware components in the managed system and send indications when there is a problem
- An indication handler that exports indications with outstanding subscriptions
- A set of indication consumers which can subscribe or unsubscribe to the indications

IBM Director Core Services also installs a helper service called a CIM listener. The listener receives events sent by the indication handler and ensures they are routed to the correct consumers.

The installation also creates a default set of subscriptions between the consumers and the indications.

Table 2. Default subscriptions for CIM indication consumers

CIM indication consumer	Default subscriptions
IBM Director events (CIM > System events)	All indications of all severities *after* the Level-1 managed system is discovered and unlocked by a management server
Hardware Status task (also the IBM Director Console Group Contents pane)	All indications of all severities except for Lease Expiration and Warranty Expiration
Microsoft Windows Event Log (event log event ID)	All indications of all severities
Local message window	None
Microsoft System Management Server (SMS)	All indications of all severities
SNMP (Tivoli NetView, HP OpenView, CA Unicenter, Tivoli Enterprise Console®)	All indications of all severities
Microsoft Operations Manager 2005 (alerts)	All indications of all severities
Tivoli Enterprise Console (native events)	All indications of all severities

Additional reference information is available for IBM Director Core Services default subscriptions, for CIM indications, and for the cimsubscribe command used to modify subscriptions.

Discovery

This topic provides information about the IBM Director discovery process.

Discovery is the process by which IBM Director Server identifies and establishes connections with systems and devices that it can manage. The management server sends out a discovery request and waits for responses from managed systems. The managed systems listen for this request and respond to the management server that sent the request.

Before IBM Director can manage a system, that system must be discovered by IBM Director Server. After a system or device has been discovered, an icon that represents the object is displayed in the IBM Director Console window when the applicable group is selected.

Note: (Windows 2000, Server Edition only) The initial discovery performed by the management server is resource intensive. After the initial discovery is completed, the resource utilization returns to normal.

The type of discovery method that IBM Director uses to connect with systems and devices varies based on the type of device being discovered and the type of network protocols used by that device.

Managed systems and devices are classified into the following three levels:

- Level 0: Any system or device without IBM Director Agent or IBM Director Core Services installed and has SSH or DCOM/SMB running.
- Level 1: Any system with IBM CIM instrumentation installed. CIM instrumentation can be preloaded, as it is with AIX or i5/OS, or it can be installed using the Level 1: IBM Director Core Services package.
- Level 2: Any system with IBM Director Agent installed, including System p5 and pSeries running AIX, IBM iSeries running IBM i5/OS, systems running Linux 32/64, systems running Windows 32/64, and Novell NetWare. This level is limited to 5,000 licenses.

During discovery, the management server searches for Level-0, Level-1, and Level-2 managed systems. The management server then stores addresses of those systems to the IBM Director database. To discover managed systems, IBM Director can either request information from the systems and devices that are accessible on the network, or the systems and devices can be configured to send an event to IBM Director, which will cause the management server to add that system to its database. This capability is only available for Level-2 managed systems and requires that the **Auto-add unknown agents which contact server** check box to be selected in the Level-2 Discovery Preferences window.

Depending on the complexity of your network, and the needs of your organization, you will need to configure the discovery process. You will need detailed information about the layout of your network, specifically the subnet, port, and LAN information.

The base-management server includes support for the following manageable entities or managed objects:

- System Endpoint
- Storage Devices that are optimized to support the SMI-S CIM standard for storage devices
- Physical or logical platforms (for example a physical machine or hypervisor) that can host an operating system
- SNMP (or generic) Devices
- Base Clusters
- Hypervisor services objects, such as the zSeries z/VM MO that create and delete Linux for System z9 and zSeries guest operating systems
- Hardware Control Points, such as the eServer BladeCenter chassis or the Power HMC, which are the management gateway to other physical platform objects

Level-0 and Level-1 managed systems can be added manually, much like IBM Director Systems. To manually add any Level-0, Level-1 or Level-2 managed system, right-click in the systems pane and select **New** → **System**. There are only two fields, network address and system name. The system name is optional. If you do not fill it in, the host name of the system is used. After you click OK, IBM Director Server attempts to discover what type of system (Level-0, Level-1, or Level-2) is represented by the address given in the Systems window. First, it checks for the Level-2 protocol (ports 14247 on Windows, 14248 on Linux). If the system does not respond, it checks for the Level-1 protocol (SLP port 427). If the system still does not respond, it checks for the Level-0 protocols (ssh port 22 or Windows RPC ports 137-139, 145). Once the server determines the system type, it creates a managed object. If none are detected, an error is reported.

Director supports agent-initiate and server-initiated discovery.

Agent initiated discovery

In IBM Director, *agent-initiated discovery* occurs when managed systems contact the IBM Director Server rather than IBM Director Server searching for managed systems. This is a push-based discovery.

This implementation has several advantages. An agent-initiated discovery will always succeed as long as there is a TCP/IP connection from the management server to the managed systems. Also, the network traffic due to discovery requests will be negligible, compared to a server-initiated discovery.

The two available agent-initiated discovery algorithms are:

- Agent-initiated discovery using the “Add known server” entry in a unattended install of IBM Director.
- Using the **genevent** command in a batch file, which sends an event to the management server with the managed systems name and IP address.

Server initiated discovery

In IBM Director, *server-initiated discovery* occurs when IBM Director Server searching the network for Level-0, Level-1, and Level-2 managed systems. Typically, this is referred to simply as discovery. The advantage of this type of discovery is ease of configuration. You set the discovery settings once at the management server. IBM Director offers several ways to perform server-initiated discovery:

- Broadcast discovery
- Multicast discovery
- Broadcast relay discovery

- Unicast discovery
- Service Location Protocol discovery

Broadcast discovery is the default discovery method. From IBM Director Console, you can change the discovery preferences for the management server according to your business needs and network requirements.

Broadcast discovery:

When you use broadcast discovery, the management server transmits a single request to the entire subnetwork on which the management server is located, in an effort to discover manageable objects on the network.

During a broadcast discovery, IBM Director Server sends out a broadcast request to all the IP addresses that are in a specified subnet. Typically, the subnet is one where the management server is installed, but you can also send a broadcast to other subnets if broadcasts are not filtered by your network infrastructure. (By default, most gateways do not permit broadcasts to pass over subnets.)

IBM Director Server broadcasts requests using each protocol supported by IBM Director (for example, SNMP, SSH, DCOM, SLP, and IPC). You also can use broadcast discovery on other subnets if your network gateway is configured to permit broadcast messages. Your network might be configured to allow broadcast messages within a subnet, but prevent them from passing over to other subnets. The IP addresses that successfully respond to the broadcast request are saved to IBM Director along with the applicable protocol information. IBM Director Console displays the objects that respond to the broadcast discovery and that support one or more of the protocols that IBM Director uses.

Note: By default, Level-0 managed systems are not discovered using broadcast discovery. Level-0 managed systems are discovered using unicast discovery, and an IP address range must be specified for the unicast.

Attention: Broadcast discovery consumes network resources. If IBM Director is configured to perform broadcast discoveries frequently, your network resources might be inefficiently used. As a best practice, contact your network administrator to determine the best discovery method for your organization.

Multicast discovery:

In multicast discovery, the management server sends a request to a specified IP address, called the *multicast group*. The multicast group that is used by IBM Director Server by default is 224.0.1.118.

Multicast discovery is used to identify Level-1 and Level-2 managed systems. This discovery method is useful on networks that are configured to filter broadcast requests but not multicast requests.

One of the attributes of a multicast request is the maximum time-to-live (TTL), which is the number of times a request is passed between subnets. After the TTL expires, the packet is discarded.

Note: You can use multicast discovery to discover systems across multiple subnets without configuring specific network information for each subnet. However, some networks are configured to prevent multicast requests from passing between subnets. As a best practice, contact your network administrator to determine the best discovery method for your organization.

Broadcast relay discovery:

In broadcast relay discovery, the management server sends a discovery request message to a specific Level-2 managed system, instructing the managed system to perform a discovery on the local subnet using a general broadcast. To perform the broadcast relay discovery, the system that performs the general broadcast must have already been discovered by IBM Director.

Broadcast relay discovery is used to identify Level-2 managed systems.

This discovery method is useful when the management server and the managed systems belong to different subnets and the network is configured to filter broadcast requests across those subnets.

Note: Typically, the Level-2 managed system that performs the general broadcast discovery is on a different subnet from the management server; however, it is not required.

When managed systems on the same subnet as the Level-2 managed system receive the discovery request, they reply directly to the management server that made the original request. This type of discovery generates less network traffic than a unicast discovery and avoids many of the problems associated with broadcast discovery when the network is configured to filter or prevent broadcasts. You might want to consider broadcast relay discovery if you have multiple physical locations in which managed systems reside, with lower-bandwidth network infrastructure (such as T1 or frame relay) between these physical sites.

Unicast discovery:

In unicast discovery, the management server sends requests directly to an exact IP address or range of IP addresses. Each address that you specify is contacted individually.

Unicast discovery is used to discover Level-0, Level-1, and Level-2 managed systems.

You can use this discovery method if your network filters both broadcast and multicast requests.

The disadvantage of a unicast discovery is that an IP packet must be sent for each individual IP address, which increases network traffic.

Service Location Protocol discovery:

In Service Location Protocol (SLP) discovery, the management server sends a request message for the IBM Director Agent SLP service type. An SLP Service Agent that replies to the request is identified in IBM Director Console as a Level-1 managed system.

SLP is an open-source Internet-standards track protocol that allows network applications, such as IBM Director, to discover the location and configuration of network services in a network. In an SLP implementation, an agent is a software entity that processes SLP protocol messages. There are three types of SLP agents:

User Agent (UA)

The SLP User Agent is a software entity that is looking for the location of one or more services. In an IBM Director environment, IBM Director Server acts as the user agent when it performs an SLP discovery.

Service Agent (SA)

The SLP Service Agent is a software entity that advertises the location of one or more services. In an IBM Director environment, Level 1: Core Services acts as the service agent. These Level-1 managed systems can advertise through the use of multicast messages and unicast responses to queries.

Directory Agent (DA)

The SLP Directory Agent is a software entity that acts as a centralized repository for service location information. If your network administrator has configured a directory agent, you can configure IBM Director to use the directory agent to discover service agents.

When you install Level 1: IBM Director Core Services on a system, SLP and the IBM Director Agent SLP service type (management.software.IBM:director-agent) are installed on that system. Common Information Model (CIM) also is installed with Level 1: IBM Director Core Services.

SLP discovery is used to identify only Level-1 managed systems.

You can configure IBM Director to send an SLP discovery request as a unicast, multicast, or broadcast message. Some older versions of service agents do not support multicasting and might have to be discovered by using a broadcast.

Event management

An *event* is an occurrence of significance to a task, system, or managed object, such as the completion or failure of an operation. In a system-management environment, IBM Director Server receives events, traps, and notifications from many sources.

These sources include, but are not limited to, the following programs and protocols:

- IBM Director native events generated by IBM Director Agent
- CIM indications from the CIMOM that is installed as part of IBM Director Agent and IBM Director Core Services
- Microsoft Windows event log
- Windows Management Instrumentation (WMI)
- SNMP traps through out-of-band communication
- Platform Event Traps (PET) through out-of-band communication from Alert Standard Format (ASF)-capable systems and Intelligent Platform Management Interface (IPMI)- capable systems
- IBM service processors notifications through out-of-band communication

When IBM Director Server receives these events or notifications, it converts them into IBM Director events. For example, when IBM Director Server receives a CIM indication, it converts the CIM indication into an IBM Director event of the type CIM. When you view the Event Filter Builder tree, the CIM events are displayed under the CIM node in the tree.

Note: IBM Director can convert CIM indications into other event types, including event types that are used by enterprise-level system-management programs, such as SNMP events. Using these event types, IBM Director can provide system data to the by enterprise-level system-management programs through the IBM Director Upward Integration Modules. For more information, see the ″CIM indications in IBM Director″ section of the *IBM Director Events Reference*.

However, these SNMP events are not the same as SNMP traps that IBM Director Server receives out-of-band (that is, not through IBM Director Agent or IBM Director Core Services). Out-of-band SNMP traps are generated by hardware products and other software programs. They are displayed under the SNMP node in the Event Filter Builder tree, but beneath a different subnode.

You can use the events in the Event Filter Builder tree when working with managed objects. To monitor one or more events, you must create an event filter that contains an event type from one of these sources, use the event filter as part of an event-action plan, and then apply the event-action plan to a managed object. Events from the Windows event log are displayed in the Windows event log tree in the Event Type Filter Builder. Events from WMI are displayed in the Common Information Model (CIM) tree.

Alerts and resolutions

In IBM Director, an event can be in one of the following categories: alert and resolution. Typically, an *alert* is the occurrence of a problem relating to a managed object. A *resolution* is the occurrence of a correction or solution to a problem.

Note: In the IBM Director product, there are tasks and features that use the word *alert* in place of the word event. Also, ServeRAID Manager uses the word *notification* instead of event.

Monitoring operating-system specific events

If you want to monitor Windows- or i5/OS-specific events in the IBM Director environment, you must create an event-action plan in order for IBM Director to process these events. The predefined active event-action plan in IBM Director, Log All Events, does not monitor these operating-system specific events.

Managed objects running Windows or i5/OS can generate the following operating-specific events:

Window-specific event types	• Windows event log • (Optional) A subset of the following CIM events: – Windows event log – Windows services – Windows registry
i5/OS specific event types	• Msgq

Even though these events are generated by their respective operating systems (or an optional layer that is installed on the operating system), IBM Director does not process these events unless you create an event-action plan to do so. When you install IBM Director, it has one predefined active event-action plan: Log All Events. However, this event-action plan does not log these Windows- or i5/OS-specific events. You must create an event-action plan with a simple-event filter that contains the event types for one or more of these events. Then, you must apply this event-action plan to the managed object running Windows or i5/OS.

When IBM Director Agent starts on a managed object running Windows, the twgescli.exe program starts, too. This program listens for IBM Director Server to send a message to IBM Director Agent that an event-action plan has been applied to that managed object. If the event-action plan includes a simple-event filter that contains the event types for any of the Windows-specific events, IBM Director appropriates these events for its own use. This is called *event subscription*. The twgescli.exe program subscribes to the event types that are specified in the event-action plan and translates the Windows-specific events into an IBM Director event type. Then, the program forwards the events to the management server from which the event-action plan was applied.

When IBM Director Agent starts on a managed object running i5/OS, the process is the same with comparable code to twgescli.exe that is included in IBM Director Agent for i5/OS.

Processing an event in IBM Director

Understanding how IBM Director processes an event can help you build and troubleshoot event-action plans.

IBM Director completes the following steps to determine which event actions to execute:

1. The managed object generates an event and forwards the event to all the management servers that have discovered the managed object (except for some events, such as those that are generated through meeting or exceeding a resource-monitor threshold, which are sent only to the management server where the thresholds are configured and applied).
2. IBM Director Server processes the event and determines which managed object generated the event and which group or groups the managed object belongs to.
3. IBM Director Server determines whether any event-action plans are applied to the managed object or to any of the groups of which the managed object is a member.
4. If an event-action plan has been applied, IBM Director Server determines whether any event filters match the event that was generated.
5. The management server performs any event actions for each matching event filter.

Event-action plans

When you create an event-action plan, you attach one or more event actions to a specified event filter. Then, you include one or more event filters in the event-action plan. Finally, you apply that event-action plan to a system or group of systems.

An event-action plan is composed of two types of components:

- Event filters, which specify event types and any related parameters
- Event actions, which occur in response to filtered events

You can apply an event-action plan to an individual managed object, several managed objects, or a group of managed objects.

By creating event-action plans and applying them to specific managed objects, you can be notified by e-mail or pager, for example, when a specified threshold is reached or a specified event occurs. Or you can configure an event-action plan to start a program on a managed object and change a managed-object variable when a specific event occurs. You can use process-monitor events and resource-monitor events to build an event-action plan.

Successful implementation of event-action plans requires planning and consideration of how you will implement them. In particular, developing and following strict naming conventions is important, so that you can easily identify what a specific plan does.

Modifying an existing event-action plan

You can modify an existing event-action plan, even one that is already applied to managed objects or groups, using the Event Action Plan Builder.

If you modify an event filter or an event action that is used in an existing event-action plan, the changes are applied automatically to any event-action plans that use those filters or actions. If you add or delete a filter or an action that is used in an existing event-action plan, the following warning is displayed.

Event filters

An *event filter* specifies an instance of one or more events that you want IBM Director to process. IBM Director ignores any event instances that do not meet the specifications of the event filter. Because the event filter can specify possible values for the extended attributes that are included in an event type's definition, an event instance can be customized for very specific problems and occurrences. To permit users to quickly event filters, the extended attributes include default values; however, users can customize the extended attribute settings.

You can use an event filter to capture a single event or multiple events. The following list includes some of the criteria that you can use to determine whether to include an event with other events:

- All managed objects that are targeted for the filter are able to generate all events that are included in the filter. If the managed object does not generate the event for which the filter is defined, the filter will not be effective on that managed object.
- The event actions that will be used to respond to the event are the same for all targeted objects.
- The other event filter options besides the event type are common for all targeted objects. These settings include the times the event filter is active, the severity of the event, and other attributes.

Event-action plans can include event filters with event types that are not generated by all managed objects. In such instances, you can apply the event-action plan to those managed objects, but it will have no effect. For example, if an event filter is based on a ServeRAID event and that event-action plan is applied to managed objects that do not have a ServeRAID adapter installed, the event filter has no events to filter, and therefore, no actions are performed. If you understand this concept, you can create more complex event-action plans, and you can reduce the number of event-action plans you have to build and maintain.

All currently available event types are displayed in the tree on the Event Type page in the Event Filter Builder window. The currently installed tasks and extensions publish their events in the Event Type tree when IBM Director Server or IBM Director Agent or IBM Director Core Services starts.

Note: Whether the events are published when IBM Director Server or IBM Director Agent or IBM Director Core Services starts depends on the tasks or extensions and how they are implemented.

If you add an extension to your IBM Director installation, the extension might publish its events either when it is added to the installation or when the extension sends its first event. If the extension publishes when it sends its first event, only that event is published.

Event-filter types:

IBM Director provides four types of event filters.

In the Event Action Plan Builder window, the Event Filters pane provides the following event filters.

Event filter	Description
Simple Event	Simple event filters are general-purpose filters; most event filters are this type. When you expand this tree, any customized simple event filters that you have created are displayed. Also, the following predefined, read-only event filters are displayed: • All Events • Critical Events • Environmental Sensor Events • Fatal Events • Hardware Predictive Failure Events • Harmless Events • Minor Events • Security Events • Storage Events • Unknown Events • Warning Events Some of these predefined filters use the severity of events to determine which events they will allow to pass through; other filters target a specific type of event. For example, the Critical Events filter processes only those events that have a Critical severity. The All Events filter processes any events that occur on any managed object, except for Windows-specific and i5/OS-specific events. Using one of these preconfigured event filters ensures that the correct event type or event severity is preselected. If you want to see what events are included in a predefined event filter, double-click that predefined event filter in the Event Filters pane. The “Simple Event Filter Builder” window opens, and the Event Filter Builder notebook is displayed. Select the applicable notebook page to view the selected event filters. For example, click the **Severity** tab to view the selections for the Critical Event filter. You cannot change predefined event filters; they are read-only. However, you can make changes and click **File → Save As** to save the modified event filter with another name.

Event filter	Description
Duplication Event	Duplication event filters ignore duplicate events, in addition to the options that are available in the simple event filters. To use this filter, you must specify the number of times (Count) that the same event is ignored during a specified time range (Interval). Then, this filter processes the first event that meets the criteria that are defined for this filter. Only the first event triggers the event actions that are associated with this event filter. For the associated event actions to be triggered again, one of the following conditions must be met: • The value that is specified in the **Count** field must be exceeded. • The time range that is specified in the **Interval** field must elapse. • The value that is specified in the **Count** field must be exceeded by 1 (Count+1) within the time range that is specified in the **Interval** field. For example, you can define a duplication event filter to filter on the occurrence of an offline event and define a corresponding event action to forward the event to IBM Director Server. Depending on the criteria that you define, only the first event announcing that the system is offline is processed, and all other instances in which an event meets the filtering criteria are discarded until the Count value is exceeded during the specified interval.
Exclusion Event	Exclusion event filters exclude certain event types, in addition to the simple event filter options. Using this filter, you define the criteria of the events to exclude.
Threshold Event	A threshold event filter processes an event after it has occurred a specified number of times within a specified interval, in addition to the simple event filter options. An event that meets the criteria that are defined in this filter triggers associated actions only after an event has met the criteria for the number of times that are specified in the **Count** field or only after the number of times specified in the **Count** field within the time range specified in the **Interval** field. For example, you can define a threshold event filter to monitor frequently occurring heartbeat events and forward the event to IBM Director Server only when the heartbeat event is received for the 100th time during a specified amount of time.

Event-filter criteria:

Depending on the event-filter type, you set specific values for these types of criteria.

Criteria	Description
Event Type	Use the Event Type page to specify the source or sources of the events that are to be processed. This tree is created dynamically; and entries are added by tasks and as new alerts are received. Entries in the tree can be expanded to display suboption events. Most event filters are created using only this page. It specifies the source or sources of the events that are to be processed by this filter. By default, the **Any** check box is selected, meaning that none of the events that are listed are filtered, except for Windows-specific and i5/OS-specific events. If you want to specify certain events on which to filter, clear the **Any** check box. You can highlight more than one event by pressing the Ctrl or Shift key. **Notes:** 1. When you select a root option in the Event Type tree, all suboption events are selected as well. For example, when you select **MPA** in the Simple Event Filter Builder window, all Component, Deployment, Environmental, and Platform suboption events are selected also. If additional event types are published after you create the event filter, the newly available event types are included in your event filter only if the new event types are suboption events of an event type that you selected. However, if you want to include a newly published event type that is not a suboption event, you must update the event filter by selecting the new event type. 2. The event types for BladeCenter events are displayed under **MPA**, except for BladeCenter Configuration Management events, which are displayed under **Configuration Management**.
Severity	Use the Severity page to indicate the urgency of the events that are filtered. If an event is received whose severity level is not included in the event filter, the filter will not process that event. By default, the **Any** check box is selected, indicating that all event severities are processed by the filter. When you select more than one severity, they are joined together using logical OR. The source of the event determines what severity the event is. Generally, the severity levels have the following meanings: **Fatal** The event caused a failure and must be resolved before the program or component is restarted. **Critical** The event might cause a failure and must be resolved immediately. **Minor** The event is not likely to cause immediate program failure but should be resolved. **Warning** The event is not necessarily problematic but might warrant investigation. **Harmless** The event is for information only. Most events of this severity do not indicate potential problems. However, offline events are categorized as harmless, and these events *can* indicate potential problems. **Unknown** The application that generated the event did not assign a severity level.

Criteria	Description
Day/Time	Use the Day/Time page to set the filter to accept and ignore events on certain days and at certain times of the day. By default, the **Any** check box is selected, indicating that events that occur at any time are processed by the event filter. The time zone that applies to the specified time is the time zone in which the management server is located. If your management console is not in the same time zone as the management server, the difference in time zones is displayed above the Selections pane as an aid to determining the correct time. By default, all events are passed through all filters. This includes events that were queued by IBM Director Agent because the link between the managed object and the management server was unavailable. However, you can prevent these queued events from being processed by a filter by selecting the **Block queued events** check box. This option can be useful if the timing of the event is important or if you want to avoid filtering on multiple queued events that are sent all at once when IBM Director Server becomes accessible. However, you can block queued events only if you filter events at a specified time. To block queued events, you must clear the **Any** check box.
Category	Use the Category page to specify an event filter according to the status of an event (alert or resolution of a problem). However, not all events have resolutions.
Sender Name	Use the Sender Name page to specify the managed object to which the event filter will apply. Events that are generated by all other managed objects will be ignored. By default, the **Any** check box is selected, indicating that events from all managed objects (including IBM Director Server) are processed by the event filter. Initially, only IBM Director Server is shown in the list. As other managed objects generate events, such as when a threshold is exceeded, this list is added to dynamically. If you anticipate that other managed objects will generate events, you also can type managed-object names into the field and click **Add** to add them.
Extended Attributes	Use the Extended Attributes page to specify additional event-filter criteria using additional keywords and keyword values that you can associate with some categories of events, such as SNMP. This page is available only when you clear the **Any** check box on the Event Type page and select certain entries from that page. If the Extended Attributes page is available for a specific event type but no keywords are listed, IBM Director Server is not aware of any keywords that can be used for filtering. To view the extended attributes of specific event types, expand the **Event Log** task in the IBM Director Console Tasks pane and select an event of that type from the list. The extended attributes of the event, if any, are displayed at the bottom of the Event Details pane, below the Sender Name category.
System Variables	Use the System Variables page to further qualify the filtering criteria by specifying a system variable. This page is available only if there are one or more system variables. A system variable consists of a user-defined pairing of a keyword and value that are known only to the local management server. **Note:** These user-defined system variables are not associated with the system variables of the Windows operating system.
Event Text	Use the Event Text page to specify event message text to associate with the event.

Event actions

The *event action* specifies the actions that you want IBM Director to take as a result of the occurrence of an event.

Event action types

IBM Director has several predefined event action types. With the exception of Add to Event Log, you must customize each event action type that you want to use.

Add/Remove "event" system to Static Group
Adds a managed object to or removes a managed object from a specified static group when the managed object logs a specific event.

Add/Remove source group members to target static group
Adds all specified managed objects in a source group to a target group or removes all specified managed objects from the target group.

Add a Message to the Console Ticker Tape
Displays a message in red type that scrolls from right to left at the bottom of IBM Director Console.

Add to the Event Log
Adds a description of the event to the IBM Director event log.

Define a Timed Alarm to Generate an Event
Generates an event only if IBM Director does not receive an associated event within the specified interval.

Define a Timed Alarm to Start a Program on the Server
Starts a program on the management server if IBM Director does not receive an associated event within the specified interval.

Log to Textual Log File
Generates a text log file for the event that triggers this action.

Post a News Group (NNTP)
Sends a message to a newsgroup using the Network News Transfer Protocol (NNTP).

Resend Modified Event
Creates or changes an event action that modifies and resends an original event.

Send an Alphanumeric Page (via TAP)
Windows only) Sends a message to a pager using the Telocator Alphanumeric Protocol (TAP).

Send an Event Message to a Console User
Displays a popup message on the management console of one or more specified users.

Send an Internet (SMTP) E-mail
Sends a Simple Mail Transfer Protocol (SMTP) e-mail message.

Send an SNMP Inform to an IP host
Sends an SNMP inform request to a specified IP host.

Send an SNMP Trap to a NetView Host
Generates an SNMP trap and sends it to a specified NetView host using a TCP/IP connection to the host. If delivery of the SNMP trap fails, a message is posted in the history log of the managed object.

Send an SNMP Trap to an IP Host
Generates an SNMPv1 or SNMPv2c trap and sends it to a specified IP address or host name.

Send a Numeric Page
(Windows only) Sends a numeric-only message to the specified pager.

Send a TEC Event to a TEC Server
Generates a Tivoli Enterprise Console event and sends it to a specified Tivoli Enterprise Console server.

Set an Event System Variable
Sets the managed system variable to a new value or resets the value of an existing system variable.

Start a Program on a System
Starts a program on any managed objects on which IBM Director Agent is installed.

Start a Program on the "event" System
Starts a program on the managed object that generated the event.

Start a Program on the Server
In response to an event, starts a program on the management server that received the event.

Start a Task on the "event" System
In response to an event, starts a noninteractive task on the managed object that generated the event.

Update the Status of the "event" System
When the selected resource status generates an event, causes a status indicator beside the icon of the managed object that is associated with the resource to be set or cleared according to your specification.

Event-data-substitution variables

For some event-action types, you can include event-specific information as part of the text message. Including event information is referred to as *event-data substitution*. You can use these event-data-substitution variables to customize event actions.

&date The date the event occurred.

&time The time the event occurred.

&text The event details, if they are supplied by the event.

&type The event-type criteria that are used to trigger the event. For example, the event that is generated when a managed object goes offline is of type Director > Topology > Offline. This corresponds to the entry on the Event Type page.

&severity
The severity level of the event.

&system
The name of the managed object for which the event was generated. The system name is either the name of IBM Director Agent or, in the case of an SNMP device, the TCP/IP address.

&sender
The name of the managed object from which the event was sent. This variable returns null if the name is unavailable.

&group
The group to which the target object belongs and is being monitored. This variable returns null if the group is unavailable.

&category
The category of the event, either Alert or Resolution. For example, if the managed object goes offline, the category is Alert. If the managed object goes online, the category is Resolution.

&pgmtype
A dotted representation of the event type using internal type strings.

&timestamp
The coordinated time of the event.

&rawsev
The nonlocalized string of event severity (Fatal, Critical, Minor, Warning, Harmless, Unknown).

&rawcat
The nonlocalized string of event category (Alert, Resolution).

&corr The correlator string of the event. Related events, such as those from the same monitor-threshold activation, will match this.

&snduid
The unique ID of the event sender.

&sysuid
The unique ID of the managed object that is associated with the event.

&prop:*file_name***#***property_name*
The value of the property string *property_name* from property file *file_name* (relative to the IBM\Director\classes directory).

Note: For i5/OS, the absolute directory path must be used.

&sysvar:*variable_name*
The event system variable *variable_name*. This variable returns null if a value is unavailable.

&slotid:*slot_id*
The value of the event detail slot with the nonlocalized ID *slot_id*.

&md5hash
The MD5 (message digest 5) hash code, or cyclic redundancy check (CRC), of the event data (an event-specific unique ID).

&hashtxt
Provides a full replacement for the field with an MD5 hash code (32-character hex code) of the event text.

&hashtxt16
Provides a full replacement for the field with a short MD5 hash code (16-character hex code) of the event text.

&otherstring
The value of the detail slot that has a localized label that matches *otherstring*. A detail slot is a record in an event detail. For example, an event has one event detail that has an ID of *key1* and a value of *value1*. You

can use the substitution variable &soltid:*key1* to obtain the value *value1*. You also can use &key1 to obtain the value *value1*. In the description above, *otherstring* is a placeholder for the user-defined event detail ID. However, if the passed ID is not found, “Not applicable” is returned.

Message Browser

You can use the Message Browser to view events that are sent to IBM Director Console. The Message Browser is displayed automatically whenever an alert is sent to the management console.

You can chose to have events sent to the management console when an event occurs by configuring an event action plan with the Send an Event Message to a Console User event action.

The Message Browser displays all alerts, including management console ticker-tape alerts. However, the Message Browser does not display any ticker-tape messages. A ticker-tape message can display, for example, resource-monitor data.

Groups

IBM Director allows you to organize logical sets of managed objects into groups. For example, a group might contain all managed systems that have Linux installed.

When you start IBM Director Console for the first time, the default groups are displayed. This includes the All Systems and Devices group, which contains all discovered managed objects and devices.

There are two types of groups that you can create in IBM Director:

Static groups

Static groups contains a specified set of managed systems. IBM Director Server does not automatically update the contents of a static group. The members of a static group are fixed unless you change them thru the IBM Director Console or event action plan. You can also copy the members of any dynamic group to a static group.

Dynamic groups

Dynamic groups are based on specified inventory or task criteria. You can create a dynamic group by specifying criteria that the attributes and properties of the managed systems must match. IBM Director automatically adds or removes managed systems to or from the group when their attributes and properties change, affecting their match to the group criteria.

You also can create a dynamic group based on the types of tasks for which the group of managed systems is enabled. You can initiate a specific task on all members of the group with a single drag and drop operation without having to consider whether each managed object supports that task.

You can also create *group categories* to organize your groups.

When you select a group, the managed objects that are members of that group are displayed in the Group Contents pane.

You can perform a task on all managed objects in a specific group. To perform tasks simultaneously on multiple groups, create a new group and include managed systems that you want from the multiple groups, or combine several separate existing groups into one new group.

Tip: It is might be useful to consolidate all groups for which you have administrative authority into a single category. This enables you to focus on those managed systems that are your responsibility while removing other managed systems and devices from your immediate attention.

Group account

A *group account* is a collection of user accounts. On a management server that is running Windows, you can create a group account to manage the privileges of multiple accounts together. By making a user account a member of a group account, that user has the privileges and access to the tasks that are defined for that group.

Note: You cannot manage group accounts through IBM Director on management systems that are running Linux. The group management feature is currently supported only on Windows.

When IBM Director Server is installed, two groups of IBM Director users are created automatically at the operating system level: DirAdmin (diradmin in Linux) and DirSuper (dirsuper in Linux). To create a group account you must first create a group account for the operating system that is running on the management server. Once the account is created that group must be made a member of either the diradmin or dirsuper group. After a group account has been added to the applicable IBM Director group, you can log in to IBM Director Console as an administrator and configure that group's privileges to IBM Director tasks and groups. At the operating system level, you can add user accounts to the group accounts that you create. You can manage the privileges of all the user accounts in a group by configuring the group privileges. The changes that you make will affect all of the users who are members of the group.

Group membership

The group to which a user account belongs provides group membership. On a management server that is running Windows, you can create several user accounts and make them members of the same group. The privileges that are assigned to the group in IBM Director are also assigned to its members.

Groups that are used with scalable objects

IBM Director provides several default groups of scalable objects in the Groups pane for easier management of these objects.

The default groups that are relevant to scalable objects are shown in table below.

Table 3. IBM Director groups that are used with scalable objects

Group name	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.

Table 3. IBM Director groups that are used with scalable objects (continued)

Group name	Managed objects
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.
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.

Groups used with storage managed objects

IBM Director provides several default groups of storage managed objects in the Groups pane for easier management of these objects.

This table lists the groups that support storage managed objects.

Group name	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.

Managed objects

This topic describes the concepts of managed objects in IBM Director.

A managed object is a system or device that is managed by IBM Director. IBM Director manages these types of objects:

managed system
Any computer, such as a server, desktop, workstation, or mobile computer, that can be managed by IBM Director. In this release, managed systems are subcategorized as follows:

Level-0 (″agentless″) managed systems
Systems that are managed through the network services that are native to the operating system: Secure Shell (SSH) or Windows Management Instrumentation (WMI). No IBM Director software is installed.

Level-1 managed systems
Systems that are managed through installation of IBM Director Core Services, which provides a subset of IBM Director Agent functionality, including Remote Session, Power Control, Hardware Status, Event Log, hardware-only inventory data, and distribution of system level updates.

Level-2 managed systems
Systems that are managed through installation of IBM Director

Agent, which provides added functionality for administering the system. The functionality of IBM Director Agent on the managed system will vary depending on the operating system and platform.

managed device
An SNMP device (such as a network device, printer, desktop computer, or server) that has an SNMP agent installed or embedded.

physical platform
A single physical chassis or server that has been discovered through the use of the Service Location Protocol (SLP). A physical platform also can be created when:

- A deployable system is discovered through an RDM scan.
- You right-click any blank space in the Group Contents pane to create the physical platform manually.
- IBM Director Server determines that a physical platform does not exist already for a blade server in a BladeCenter unit.
- IBM Director Server first discovers and gains access to a Level-1 or Level-2 managed system.
- IBM Director Server gains Internet Protocol (IP) access to a Remote Supervisor Adapter service processor. It will query the Remote Supervisor Adapter or Remote Supervisor Adapter II service processor for the topology of its associated ASM interconnect network, and for each ISMP system found, a physical platform is created.

A physical platform can identify some managed systems before an operating system or IBM Director Agent is installed.

Note: To delete a physical platform from IBM Director Console, you also must delete any associated managed system or systems.

Scalable objects
Systems with multinode configurations, including scalable systems, nodes, and partitions.

BladeCenter chassis

Windows cluster

Racks Racks that are created by Rack Manager.

Static partitions

Managed system

A managed system is a computer, such as a server, desktop, workstation, or mobile computer, that can be managed by IBM Director. There are three levels that are used to categorize managed systems.

Level 0: Agentless Systems

Level 0: Agentless Systems do not have any IBM Director software installed on them; however, although they can still be managed by using IBM Director. Level-0 managed systems can be IBM or non-IBM servers, desktop computers, workstations, and mobile computers.

A Level-0 managed system is a managed system that does not have IBM Director Agent or the Common Information Model (CIM) instrumentation installed, but does have the minimum set of protocols that are required for that system to be managed by IBM Director. To manage a system using IBM Director, that system, at a minimum, must support the Secure Shell (SSH) or Distributed Component Object Model (DCOM) protocol.

Level 0: Agentless Systems is supported on systems that are running the following operating systems. For a detailed list of supported operating-system versions, see *IBM Director Installation and Configuration Guide*.
- Linux
- Windows

IBM Director discovers Level-0 managed systems by verifying the IP addresses on your network and scanning the ports of those addresses using the SSH or DCOM protocols. The range of IP addresses that are verified is governed by the IBM Director discovery preferences that you configure in IBM Director Console. By default, IBM Director uses the range of addresses that are in the IP domain of the management server.

When a Level-0 managed system is discovered, it is locked by default. You can unlock the system by requesting access to it through IBM Director Console. If the object that is discovered supports SSH but is not a computer system (for example, a Remote Supervisor Adapter (RSA)), the object will be displayed in IBM Director Console but will not support any tasks. Systems and other network devices that support the SNMP protocol will display as SNMP Device Managed Objects in IBM Director Console.

The attributes that are returned for a Level-0 managed system include:
- Locked
  - System Name
  - TCP/IP Addresses
  - System State
  - MAC Address
  - System Presence Check Setting
- Unlocked
  - Computer Name
  - Architecture
  - OS Major Version
  - OS Minor Version
  - Access Denied
  - Operating System
  - Unique System ID
  - System UUID (xSeries)
  - Machine Type
  - Model Number
  - Serial Number

After you discover and unlock a Level-0 managed system, you can perform the following tasks on that system:
- Collect inventory that is available from the operating system.
- Install Level 1: Core Services or Level 2: IBM Director Agent by using software distribution.
- Restart the operating system (Linux only).
- Run command-line programs (only if SSH is present).

Level 1: IBM Director Core Services systems

Level 1: IBM Director Core Services provides managed systems with a subset of the Level 2: IBM Director Agent functionality that is used to communicate with and administer that system. Specifically, it provides hardware alerts and status information that can flow to Director or 3rd party management servers.

A *Level-1 managed system* is any system that has Level 1: IBM Director Core Services installed but does not have Level 2: IBM Director Agent installed. Level-1 managed systems can be IBM servers, desktop computers, workstations, and mobile computers.

You can perform these tasks on a Level-1 managed system:

- Collect inventory.
- Install Level 2: IBM Director Agent using software distribution.
- Manage events using event action plans, event subscription, and the event log.
- Monitor hardware status.
- Restart or shutdown the managed system.
- Run command-line programs.

Level 1: IBM Director Core Services is supported on systems that are running the following operating systems. For a detailed list of supported operating-system versions, refer to the *IBM Director Installation and Configuration Guide*see .

- Linux (xSeries, System p5 and pSeries, and System z9 and zSeries)
- Windows

Level 2: IBM Director Agent systems

Level 2: IBM Director Agent provides managed systems with the full complement of IBM Director Agent functionality that is used to communicate with and administer that system. The functionality of Level-2: IBM Director Agent on a managed system varies, depending on the operating system and platform.

A *Level-2 managed systems* is any system that has Level 2: IBM Director Agent installed. Level-2 managed systems can be IBM or non-IBM servers, desktop computers, workstations, and mobile computers.

Level 2: IBM Director Agent is supported on systems that are running the following operating systems. For a detailed list of supported operating-system versions, refer to the *IBM Director Installation and Configuration Guide*.

- AIX
- i5/OS
- Linux (xSeries, System p5 and pSeries, and System z9 and zSeries)
- NetWare
- Windows

Mass configuration profiles

Using mass-configuration profiles, you can to quickly configure a group of managed objects.

One of the advantages of IBM Director is its ability to make certain configuration changes on multiple managed systems at once. Even in a dynamic host control protocol (DHCP)-enabled environment, many critical servers tend to use static addresses. Using mass-configuration profiles, you can, for example, change the IP address that these managed systems use to locate their primary DNS server, without having to physically visit each system.

A *mass-configuration profile* identifies the configuration information that you want to distribute to a managed object or group. You can create a profile for these IBM Director tasks:

- Asset ID™
- Configure Alert Standard Format
- Configure SNMP Agent
- Network Configuration

The mass-configuration profiles are saved in the Tasks menu (and in the Tasks pane) under the task with which they are associated. After you create a mass-configuration profile, you then can apply that profile to a managed object or a group.

Restriction:

- You can configure only the community name and trap destination in a mass-configuration profile for the Configure SNMP Agent task. You cannot configure security information.
- Specifying a community name in the profile adds the community name as a trap destination only. For IBM Director to receive traps sent to that community, you must manually add the community name to the IBM Director Server.
- If you want to perform SNMP sets on managed systems, you must manually modify the Security pane in the SNMP service properties window, adding the correct Community Name as READ WRITE or READ CREATE enabled on each managed system.

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.

Scalable objects

Scalable objects are IBM Director managed objects that are used with multinode configurations of supported xSeries servers.

Scalable objects in IBM Director for xSeries 460 servers include:

- Scalable nodes
- Scalable partitions
- Scalable systems

IBM Director communicates out-of-band with 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.

Note: IBM Director performs only 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.

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 multinode 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 multinode server into a different physical configuration after it has been used with IBM Director, you must notify IBM Director of the recabling changes by reestablishing out-of-band communication.

Groups that are used with scalable objects

IBM Director provides several default groups of scalable objects in the Groups pane for easier management of these objects.

The default groups that are relevant to scalable objects are shown in table below.

Table 4. IBM Director groups that are used with scalable objects

Group name	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.
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.

Power operations for scalable partitions

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.

Restriction: 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.

Discovering scalable objects

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.

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.

Security

IBM Director offers several security features, including authentication and user-administration options that enable system administrators to specify user privileges, support for Secure Sockets Layer (SSL), and optional encryption of interprocess communication.

Authentication

This topic provides conceptual information about authentication.

Integrated into IBM Director is a security mechanism by which a managed system can authenticate any management server attempting to access it. Authentication enables Level-1 and Level-2 managed system to accept commands from only an IBM Director Server that is trusted (that is, authorized to manage it). Authentication protects Level-1 and Level-2 managed system from access by unauthorized management servers or rogue managed-system applications.

The IBM Director authentication process is based on two interlocking concepts:
- Digital-signature certification
- Security state of the managed system

Digital-signature certification:

This topic provides conceptual information about digital-signature certification.

IBM Director authentication is based on the Digital Signature Algorithm (DSA). DSA is the public-key algorithm specified by the Digital Signature Standard of the National Institute of Standards and Technology. It enables the holder of a public key to verify the signature for a digital document that has been signed by a holder of the corresponding private key. In an IBM Director environment, it works in the following way:

1. IBM Director Server attempts to access IBM Director Agent. IBM Director Server bids the public keys that correspond to the private keys it holds.
2. IBM Director Agent checks these keys. If it considers the keys to be trusted, IBM Director Agent replies with a challenge that consists of one of the trusted public keys and a random data block.
3. IBM Director Server generates a digital signature of the random data block using the private key that corresponds to the public key included in the challenge. IBM Director Server sends the signature back to IBM Director Agent.
4. IBM Director Agent uses the public key to verify that the signature is a valid signature for the random data block. If the signature is valid, IBM Director Agent grants access to IBM Director Server.

This digital-signature scheme has the following benefits:

- The public keys stored on the managed systems can be used only for verifying access.
- Using a random data block for signing makes replay attacks unusable.
- Generating a private key corresponding to a given public key is cryptographically improbable, requiring 2^{128} or more operations to accomplish.

For Level-1 managed systems, the digital-signature certificate expires after 365 days. You can configure notification and polling settings when the certificate is about to expire. You can also create an event action plan to notify you of an expiring certificate.

Security states of managed systems:

This topic provides information about the security state of a managed system.

A managed system is in either an unsecured or secured state. A managed system is *unsecured* when any management server can access it and perform functions on it. A managed system is *secured* when only an authorized (trusted) management server can access it.

The initial security state of IBM Director Agent depends on the underlying operating system.

Table 5. Initial security state of IBM Director Agent

Operating system	**Security state**
AIX	Secured by default during installation of IBM Director Agent.
i5/OS	Secured by default during installation of IBM Director Agent.
Linux	Secured by default during installation of IBM Director Agent.
NetWare	Unsecured by default. Must be secured manually or during discovery. See Securing managed systems for more information.
Windows	Can be secured during installation of IBM Director Agent.

If IBM Director Agent is not secured during installation of IBM Director Agent, you can secure the managed system manually or during discovery.

Note: The IBM Director Agent running on a management server is secured automatically. It has a trust relationship with only the IBM Director Server installed on the same server.

On managed systems running Windows, the security state is determined by the secin.ini file. If the secin.ini file is initialized as unsecured, any management server can access the managed system and establish a trust relationship with IBM Director Agent. IBM Director Server establishes a trust relationship by giving IBM Director Agent a copy of its public key.

When the managed system has been secured by a management server, only that management server, any management servers that had previously established a trust relationship, and any future management servers that successfully request access are able to access the managed system.

Where the security information is stored:

This topic provides information about where security information is stored.

The information needed for authentication is stored in files on both the management server and the managed systems.

The public keys are stored in dsa*xxxxx*.pub files, where *xxxxx* is a unique identifier. The private keys held by IBM Director Server are stored in dsa*xxxxx*.pvt files. For example, the dsa23ef4.pub file contains the public key corresponding to the private key stored in the dsa23ef4.pvt file.

On systems running Windows, the secured or unsecured state data is stored in the secin.ini file, which is generated when you first start IBM Director Server or IBM Director Agent. On management servers, this file is initialized as secured; on managed systems, it is initialized as either secured or unsecured, depending on which options were selected during the installation of IBM Director Agent.

By default, the files are located in the following directories.

Operating system	Directory
AIX	/opt/ibm/director/data
i5/OS	/QIBM/UserData/Director/data
Linux operating systems for AMD64 and 32-bit systems	/opt/ibm/director/data
Linux operating systems for Intel Itanium and IBM iSeries and pSeries	/opt/ibm/director/data
NetWare	*d*:\IBM\Director
Windows	*d*:\Program Files\IBM\Director\Data

where *d* is the drive letter of the hard disk on which IBM Director is installed and IBM Director is installed in the default location.

How the keys and sec.ini files work together:

This topic provides information about how the keys and the secin.ini files work together.

When you first start IBM Director Server, it randomly generates a matching set of public and private key files (dsa*.pub and dsa*.pvt files). The secin.ini file is generated and initialized as secure.

The initial security state of a managed system depends on the following factors:

- Which operating system it is running
- Which features were selected during the installation of IBM Director Agent

Managed systems running NetWare are set to the unsecured state automatically. For all other managed systems, the initial security state depends on which features are selected when IBM Director Agent is installed. If either encryption or agent/server security is selected, the managed system is set automatically to the secured state.

While a managed system is in the unsecured state, it accepts a public key from *every* management server that attempts to access it. Through this process, the managed system establishes trust relationships with those management servers.

If a management server secures that unsecured managed system, it gives that managed system a copy of its public key *and* its secin.ini file, which is initialized as secure. After this has occurred, the managed system no longer accepts any new public keys from management servers. However, the managed system continues to grant access to any management server whose public key is stored on the managed system.

Key information and management:

This topic provides information about public and private keys and how to manage them.

The public and private key files are binary files, but they contain textual data that indicates their origin. If a dsa*.pub or dsa*.pvt file is printed using the type command at a command prompt, the following data is displayed in the first line:

```
DSAKeytypeString
```

where:

- *Keytype* indicates the type of the key. "P" denotes private, and "p" denotes public.
- *String* is the name of the management server that generated the key file.

For example, `DSAPtest1` indicates a private key file generated by a management server named test1, and `DSAptest1` indicates the public key file generated by the same management server.

It is *very important* to back up and protect the dsa*.pvt files. If they are lost, you cannot regenerate these files.

User accounts

A user account is an account that is set up for an individual that defines that user for IBM Director. The information that is saved to the account is full name, user ID, password, privileges, group access, task access, pager number, and e-mail address. From IBM Director Console, you can manage user accounts.

IBM Director user accounts are based upon the underlying operating-system accounts. When IBM Director Server is installed, two groups of IBM Director users are created automatically at the operating-system level: administrators and super users. The two user groups have different levels of access to IBM Director:

Administrator group

Members of the administrator group have general access to IBM Director, although the privileges available to the administrator group or an individual user can be restricted by a super user.

Super-user group

Members of the super-user group can define the privileges available to the administrator group. Also, they can create and edit individual user accounts. The privileges available to members of the super-user group cannot be restricted.

The following table lists the operating-system specific names of the IBM Director user groups.

Table 6. IBM Director user groups

Operating system	Administrator group	Super-user group
i5/OS	QIBM_QDIR_ADMINISTRATOR	QIBM_QDIR_SUPER_ADM_PRIVILEGES

Table 6. IBM Director user groups (continued)

Operating system	Administrator group	Super-user group
Linux	diradmin	dirsuper
Windows	DirAdmin	DirSuper

To create a user that has access to IBM Director Server, you must first create a user account for the operating system that is running on the management server. Once the account is created, that user must be made a member of either the diradmin or dirsuper group. Root users (users belonging to the root group) or members of the Administrator group on Windows are also able to access IBM Director. After a user account has been added to the applicable IBM Director group, you can log in to IBM Director Console as an administrator and configure that user's privileges to IBM Director tasks and groups. On Windows, the IBM Director service account is automatically assigned to the super-user group (DirSuper). In addition, all operating-systems accounts with administrator privileges on the management server automatically can access IBM Director Console. Users with such operating-system accounts can access the same IBM Director privileges as members of the DirAdmin group.

On i5/OS, the groups are not automatically populated. A user with security administrator authority must assign users to the appropriate groups.

On Linux, the groups are not automatically populated. A user with root privileges must assign users to the appropriate groups.

On a management server that is running Windows, you also can create additional groups at the operating-system level and add these groups to the diradmin or dirsuper groups. The subgroups that you add to the diradmin or dirsuper groups can be managed in IBM Director.

Encryption

This topic provides conceptual information about encryption.

IBM Director contains a security feature that encrypts all data in interprocess communications, except transport-layer datagrams used during discovery. This encryption feature provides automatic key management and enables you to select an encryption algorithm from the provided libraries:

- IBM Java Cryptography Extension (JCE)
- OpenSSL

JCE provides ciphers for all Java-based platforms, including i5/OS and Linux; OpenSSL provides ciphers for 32-bit Windows operating systems.

Encryption is disabled by default. To encrypt data transmitted between Level-1 and Level-2 managed systems and IBM Director Server, you must enable encryption on both IBM Director Server and Level-1 and Level-2 managed systems.

When you install IBM Director Server, you can select one of the following encryption algorithms:

- Advanced Encryption Standard (AES)
- Data Encryption Standard (DES)
- Triple DES

IBM Director Server automatically generates a key, based on the encryption algorithm selected. IBM Director Server stores the key in memory and presents it to IBM Director Core Services or IBM Director Agent each time IBM Director Core Services or IBM Director Agent is started, using the Diffie-Hellman key exchange. This makes it unnecessary for a key to be stored on each managed system.

The following table outlines how data is transmitted between IBM Director Server and Level-1 and Level-2 managed systems, depending on whether encryption is enabled.

Table 7. Encryption state and data transmitted between IBM Director Server and IBM Director Agent

	IBM Director Core Services or IBM Director Agent (encryption enabled)	**IBM Director Core Services or IBM Director Agent (encryption disabled)**
IBM Director Server (encryption enabled)	Encrypted	Unencrypted
IBM Director Server (encryption disabled)	No data transmission possible	Unencrypted

Important: If two management servers have discovered each other (and they each appear in each other's IBM Director Console as managed nodes), and one management server (server A) has encryption enabled, and the other management server (server B) either has encryption disabled or has encryption enabled now but had it disabled when it was discovered and the communication has not ended since the discovery, then unencrypted transmissions sent by server B to server A will continue until the previous communication is ended. This occurs because server A (in its role as a management server) is already communicating with server B (in its role as managed system) in plain text. You can delete these managed objects from each other's console to end the unencrypted communication, and if you run multiple management servers that can discover each other, you can enable encryption on both management servers before they are started or before they can discover each other. You can also use the **dircli lsmo** command to check for previous communication.

Notes:

- Encryption is not supported on managed systems running NetWare or systems running 64-bit versions of Windows.
- Neither out-of-band communications nor communication used by Internet tools, such as Telnet or File Transfer Protocol (FTP), are encrypted.
- Enabling encryption imposes a performance penalty. Encrypting data packets and exchanging encryption keys has an effect on the speed with which IBM Director completes management operations. When either the management server or the managed systems are restarted, keys are regenerated and exchanged. Consequently, an unsecured managed system might appear to be unmanageable for a period of time.

Software distribution

This topic compares two methods for distributing software.

IBM Director supports the following methods of software distribution:

- Streaming from the management server
- Using redirected distribution

Streaming from the management server

This topic describes advantages and disadvantages of distributing software by streaming from the management server.

Software-distribution packages are copied directly from the management server to the managed system.

This method of software distribution is resource-intensive. It can have a negative effect on the management server performance. In addition, a package distributed by this method requires that the target managed system have empty disk space twice the size of the package.

For Level-2 managed systems, streaming from the management server has one advantage, however. If a network connection is broken during the transmission, IBM Director attempts to resume the connection from the point at which the transmission was interrupted. If the streaming operation can be resumed, retransmission time is saved.

Because of the ability to resume distribution, you might prefer to stream a software package from the management server if you have an unreliable or slow network link.

Using redirected distribution

This topic describes advantages and disadvantages of using redirected distribution to distribute software.

Many software packages are tens or hundreds of megabytes in size. Distributing software of this size across a large network can cause bottlenecks in network data transmission. To avoid this problem, you can set up a universal naming convention (UNC) or FTP share on a network server. IBM Director Server streams software packages to the network share, where they are cached. From the share, they are either streamed to the managed systems or, in the case of software that uses the Microsoft Windows Installer or InstallShield as the installation utility, installed directly from the file-distribution server.

Redirected distribution greatly reduces the software-distribution traffic in your network. It uses fewer system resources on the management-server. In addition, if you install InstallShield or Microsoft Windows Installer (MSI) packages directly from the file-distribution server, redirected distribution requires less disk space on the managed systems.

Redirected distribution has one limitation: if a redirected distribution of a software package is interrupted (for example, if the network connection is lost), the installation must begin all over.

File-distribution server considerations

Consider the following issues when setting up file-distribution shares:

- In a Windows environment, the file-distribution server must either be a member of the same domain as the management server or have a trust relationship with that domain.

- The management server must have full read/write access to the share. The user ID and password that were used to install IBM Director Server must also be present on the file-distribution server. Otherwise, software distribution uses streaming from the management server.
- The share must allow read access to all managed systems that you want to access the share.
- If the file-distribution server is configured as an FTP server, you can choose to use FTP when transferring packages from the management server to the share. For managed systems running Windows, the home directory for the FTP login must be the same directory as the file-distribution server. For example, if c:\stuff\swd_share is mapped to \\server\swd_share, then c:\stuff\swd_share must be the home directory for the FTP user ID login used on the FTP file-distribution server configuration panel.
- You can enable null credentials to access the share so that you do not have to specify a user ID and password for each managed system or group that needs to access the share. To enable null credentials, you must issue the **twgshare** command. This alters a registry setting on the file-distribution server, which enables managed systems to use null credentials to access the share. To issue the **twgshare** command, complete the following steps:
  1. Copy the twgshare.exe file to the file-distribution server. This file is in the \IBM\director\bin\ directory.
  2. From a command prompt, type the following command:

     ```
     twgshare -a sharename
     ```

     where *sharename* is the name of the share on the file-distribution server.
- If you do not want to use null credentials (which are a security risk), you must set up an operating-system account on the file-distribution server. This account must have read access to the share. Enter the user ID and password for this account when you configure distribution preferences for managed systems. In addition, the account must exist on each managed system so that IBM Director Agent can specify this user to mount the share.

SNMP devices

IBM Director discovers SNMP devices in your network according to discovery parameters that you can specify. The process that is used to discover SNMP devices in your network uses lists of initial IP addresses, SNMPv1 and SNMPv2c community names, subnet masks, and SNMPv3 profiles.

IBM Director works with SNMPv1, SNMPv2c, and SNMPv3 for all communications and recognizes Management Information Bases (MIBs) in System Management Information (SMI) version 1 and version 2 formats.

SNMPv1 and SNMPv2c devices and agents use community names to control their access. A community name can be any case-sensitive text string. By default, the community name of an SNMP device is set to `public`. If specific SNMP devices in your network have unique community names to restrict access, you can specify the correct name to gain access to a device. SNMPv3 devices and agents use profiles to control their access.

The subnet mask enables you to further refine the scope of the discovery process, limiting the search to certain subnets in the network. The default subnet mask is set to the subnet of each corresponding IP address.

Using your lists of IP addresses, community names, and subnet masks, a series of SNMP GET statements are performed against port 161 of the IP address to determine whether the address is associated with a valid SNMP device. A valid SNMP device for IBM Director has the following accessible values: sysName, sysObjectID, sysLocation, sysContact, sysDescr, and sysUpTime. If the object is determined to be a valid SNMP device, another series of SNMP GET statements are sent to obtain information in the ipNetToMediaNetAddress table, where additional IP addresses can be used to discover even more SNMP devices. The search continues until no new addresses are located. Newly discovered or created SNMP-device managed-object names default to the value of sysName. If sysName has no value, the host name of the device is used. If no host name is assigned, the IP address is used.

All SNMP traps that are configured with IBM Director Server as the destination are forwarded as events to the event log. Therefore, you can view an SNMP trap using the event log on the SNMP managed device that originated the trap. If a trap is received that corresponds to an SNMP device that has not been discovered, IBM Director creates the device automatically, if you selected the **Auto-add unknown agents which contact server** check box on the SNMP Discovery page in the Discovery Preferences window.

The MIB file is used to translate raw SNMP dotted decimal notation into human-readable text. This is especially useful for SNMP devices for Level-0 managed devices, which do not have IBM Director Core Services or IBM Director Agent installed (such as network hubs, switches, printers, and USPs). MIBs that are placed in the data\snmp directory on the management server are compiled automatically. You can also compile MIBs manually from the SNMP Browser window.

Storage managed objects

IBM Director recognizes certain storage devices that comply with the Storage Management Initiative Specification (SMI-S). This is an industry standard developed by the Storage Networking Industry Association (SNIA). IBM Director supports SMI-S versions 1.1 and 1.0.2.

IBM Director provides support these storage devices:
- IBM System Storage DS300
- IBM System Storage DS400
- IBM System Storage DS4000

IBM Director communicates with the storage devices through their respective SMI-S providers. Their Service Location Protocol (SLPv2) component enables the devices to be discovered by IBM Director, which looks for SNIA-defined SLP service types.

IBM Director obtains information about storage devices through the SMI-S provider’s Common Information Model Object Manager (CIMOM) component. Communication occurs using the Distributed Management Task Force (DMTF) standard for Web Based Enterprise Management (WBEM) as required by SNIA. The information is organized according to the DMTF standard for the Common Information Model (CIM) using the profiles defined by SNIA.

Note: For DS4000, the SANtricity SMI Provider from Engenio, which complies with SMI-S version 1.1, is required. You can obtain this provider from the

Engenio web site at www.engenio.com. Note that SMI providers version 1.1 are embedded in DS300 and DS400. The providers are from Adaptec.

For information on standards, see these Web sites:

SMI-S www.snia.org/smi/about

SNIA www.snia.org

DMTF
www.dmtf.org

WBEM
www.dmtf.org/standards/wbem

CIM www.dmtf.org/standards/cim

SMI-S Attributes

SMI-S attributes can include four sets of data values: Default, CIMOM, Base and Extended.

Default attributes

SMI-S storage managed objects appear on the console immediately after being discovered through SLPv2 as a locked object labeled by the host name (or IP address if DNS lookup fails). When the storage managed object is locked, only the public data surfaced through SLPv2 is available (such as a locked object that represents the CIMOM required by the SMI-S standard). Default attributes that are common to IBM Director managed objects are displayed. These attributes include:

SMI-S Storage Device Name
Starts as the primary host name or IP address of the CIMOM. Once unlocked, the generated name for the device.

System Factory ID
The managed object factory that creates the objects—SMI-S Storage Devices.

System State
State of the object. Starts as Unknown because access is required to determine the actual online, error or offline status.

System Presence Check Setting
Polling interval in minutes for checking the status.

Secure/Unsecure supported
Specifies whether securing of the target is supported.

Access Denied
True for a locked object. This attribute goes away once the object is unlocked.

Encryption Enabled
Specifies whether encryption to the target is enabled.

CIMOM attributes

Until the storage managed object is unlocked, the actual device and its associated data are unavailable. The storage managed object is unlocked by obtaining access to represent the CIMOM and the CIM schemas minded for data. The SLP provided CIMOM attributes includes:

SMI-S Provider Service ID
The unique service id of the CIMOM. As specified in SMI-S, responses from different IP addresses with the same Service ID value are assumed to be the same CIMOM and are collapsed together.

Interop Namespace
The entry namespace in CIM containing the Server profile that has the CIMOM data and list of registered profiles.

Registered Profiles Supported
The list of profiles this CIMOM claims to support.

SLP Service Names
The full service names for this CIMOM

SMI-S Provider IP Addresses
The list of one or more IP addresses for the CIMOM.

SMI-S Provider IP Port Numbers
The IP ports on this CIMOM.

Base attributes

After access is granted to the storage managed object, the full CIM data can be obtained. This might result in the device representation going away successfully because the entity already exists, or the object access failing or a security problem. If access is successful, the object becomes a representation of an actual device. The name changes based on the rules specified in the Discovery Preferences panel for SMI-S Storage Devices. The following base attributes then appear:

Registered Profile
The profile this device represents along with the version (for example, SNIA:Array 1.0.2).

Namespace
The namespace with the schema details about this particular profile.

Storage Server Manufacturer ID
The manufacturer of this device.

Storage Server Type and Model
Type and model string representing this device.

Storage Server Serial Number
Serial number for the device.

Endpoint Unique Name
Unique identifier (primary FC port in fibre channel).

Storage Device Type
Specifies whether this is a fibre channel or iSCSI device.

Extended attributes

Any extended attributes that are specified by the attribute extension files are created. These may vary based on the storage managed object. For example, for an IBM DS4000 disk array, the following attributes are displayed:

Subscriptions
Indicates whether a managed object is registered to receive state or alert indications.

Nickname

A name for the device

Controller IP Addresses

IP addresses for the controllers on the target.

External applications for storage managed objects

You can use IBM Director to start external applications for targeted storage managed objects, including Storage Manager Client for IBM System Storage DS4000 storage systems series.

Important: You must install Storage Manager Client on each management console from which you intend 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 is c:\Program Files\Common Files\IBM_FAStT\jre\1.4.

STORAGE_MANAGER

Defines the working directory of Storage Manager Client. The default directory is c:\Program Files\IBM_FAStT\client.

Groups used with storage managed objects

IBM Director provides several default groups of storage managed objects in the Groups pane for easier management of these objects.

This table lists the groups that support storage managed objects.

Group name	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.

Service processors

Hardware-based service processors, also known as management processors, work with hardware instrumentation and systems management software and are key to problem notification and resolution and allow you to remotely manage your system. In an IBM Director environment, service processors send alerts IBM Director Server when error conditions occur in a specific managed system and are key in helping you effectively managed your environment.

Communication with IBM Director Server

This topic provides information about the pathways on which data is transmitted between service processors and IBM Director Server.

There are several pathways along which communication between IBM Director Server and the service processors present in IBM Netfinity® or xSeries servers takes place:

In-band communication

IBM Director Server communicates with IBM Director Agent; IBM Director

Agent uses a device driver to pass data to and from the service processor. This also is called interprocess communication (IPC).

Over the local area network (LAN)
Data is transmitted between the service processor and IBM Director Server over the LAN. This is possible if the service processor has an integrated network interface card (NIC) or access to a NIC shared with the server.

Over the ASM interconnect
Data is passed from the service processor over an ASM interconnect network to a second service processor. The second service processor serves as a gateway between IBM Director Server and the first service processor.

Both of the latter types of communication are known as *out-of-band* communication, because they take place independent of an operating system.

An *ASM interconnect network* is a group of service processors that are networked together using the ASM interconnect feature. Connected through the RS-485 ports, the service processors can communicate with and send alerts out-of-band to IBM Director Server through a *gateway service processor* (sometimes called an ASM interconnect gateway). An ASM interconnect network eliminates the need for multiple modems, telephones, and LAN ports; it also permits service processors without network interface cards to communicate out-of-band with IBM Director Server.

Notes:

1. For IBM Director and Scalable Systems Manager (SSM) to communicate out-of-band, the following conditions must be met:
   - Service processors must maintain consistent IP addresses. You either must assign static IP addresses or configure Dynamic Host Configuration Protocol (DHCP) to maintain consistent IP addresses for the service processors.
   - The service processor IP addresses cannot change after IBM Director has discovered the server.
2. Only one of the following systems management applications can communicate with a service processor at any given time:
   - IBM Director Server
   - IBM Management Processor Command-Line Interface (MPCLI)

In-band communication and alerts

This topic provides information about when service processors can communicate in-band with and send alerts to IBM Director Server .

Whether a service processor can communicate in-band with IBM Director Server depends on both the type of service processor and the operating system running on the managed system.

Table 8. In-band communication between service processors and IBM Director Server

	Operating system		
Primary service processor	**Linux**	**NetWare**	**Windows**
Advanced System Management PCI Adapter (ASM PCI Adapter)	Yes	Yes	Yes
Advanced System Management processor (ASM processor)	Yes	Yes	Yes

Table 8. In-band communication between service processors and IBM Director Server (continued)

Primary service processor	Operating system		
	Linux	NetWare	Windows
Integrated system management processor (ISMP)	Yes	No	Yes
IPMI baseboard management processor	Yes	No	Yes
Remote Supervisor Adapter	Yes	Yes	Yes
Remote Supervisor Adapter II	Yes	Yes[1]	Yes
[1] Novell NetWare 6.5 only			

In addition, to enable in-band communication between IBM Director Server and a managed system that contains a service processor, both the service processor device driver and MPA Agent must be installed on the managed system.

When in-band communication is possible, alerts are handled either by MPA Agent or System Health Monitoring. Unless the server supports System Health Monitoring, ISMPs in servers running Linux cannot send alerts in-band, although in-band communication between the service processor and IBM Director Server is possible.

The following table specifies which IBM Director Agent feature handles in-band alerting.

Table 9. IBM Director Agent features that handle in-band alerts

Type of service processor	Operating system running on managed system		
	Linux	NetWare	Windows
ASM PCI Adapter	MPA Agent	MPA Agent	System Health Monitoring
ASM processor	MPA Agent	MPA Agent	System Health Monitoring
ISMP	None or System Health Monitoring[1]	Not applicable	System Health Monitoring
IPMI baseboard management processor	System Health Monitoring	Not applicable	System Health Monitoring
Remote Supervisor Adapter	MPA Agent or System Health Monitoring[2]	MPA Agent	System Health Monitoring
Remote Supervisor Adapter II	MPA Agent or System Health Monitoring[2]	MPA Agent	System Health Monitoring
[1] If System Health Monitoring is supported on the server. [2] MPA Agent handles the alerts, unless System Health Monitoring is supported on the server.			

See the *IBM Director Hardware and Software Compatibility* document for a list of servers on which System Health Monitoring is supported when the server is running Linux. This PDF file is updated every six to eight weeks. You can download it from the IBM Director Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

Out-of-band communication and alerts

This topic provides information about when service processors can communicate out-of-band with IBM Director Server. It also contains information about the pathways on which service processors can provide out-of-band alerts to IBM Director Server.

The type of service processor present in a server determines which paths out-of-band communication can take. Servers that contain ISMPs can communicate out-of-band with IBM Director Server only through a gateway service processor.

The following service processors all can serve as gateway service processors:
- ASM PCI Adapter
- ASM processor
- Remote Supervisor Adapter
- Remote Supervisor Adapter II

However, some of these service processors cannot communicate with certain other service processors. In addition, an ASM processor can communicate with IBM Director Server only through interprocess communication.

The following table details the possible gateway service processors and the types of service processors located on an ASM interconnect network with which they can communicate.

Table 10. Gateway service processors and communication with service processors on an ASM interconnect network

	Service processor on an ASM interconnect					
Gateway service processor	**ASM processor**	**ASM PCI adapter**	**ISMP**	**IPMI baseboard management controller**	**Remote Supervisor Adapter**	**Remote Supervisor Adapter II**
ASM PCI adapter	Yes	Yes	No	Not applicable	No	No
ASM processor	Yes	Yes	No	Not applicable	No	No
Remote Supervisor Adapter	Yes	Yes	Yes	Not applicable	Yes	Yes
Remote Supervisor Adapter II	Yes	Yes	Yes	Not applicable	Yes	Yes

To maximize the possibility of IBM Director Server receiving alerts from service processors located on an ASM interconnect network, consider using a Remote Supervisor Adapter or a Remote Supervisor Adapter II as a gateway service processor.

Note: If you have one of the following servers attached to an RXE-100 Remote Expansion Enclosure, you cannot use the on-board Remote Supervisor Adapter as a gateway service processor:
- xSeries 360
- xSeries 365
- xSeries 440
- xSeries 445

- xSeries 455

  The Remote Supervisor Adapter is dedicated to managing the RXE-100 Remote Expansion Enclosure.

The following table contains information about the pathways available for out-of-band alerting.

Table 11. Out-of-band alerting pathways

Type of service processor	Pathways for out-of-band alerting	Possible gateway service processors
ASM PCI adapter	• LAN • Over an ASM interconnect	• ASM PCI adapter • Remote Supervisor Adapter • Remote Supervisor Adapter II
ASM processor	• Over an ASM interconnect	• ASM PCI adapter • Remote Supervisor Adapter • Remote Supervisor Adapter II
ISMP	• Over an ASM interconnect	• Remote Supervisor Adapter • Remote Supervisor Adapter II
IPMI baseboard management processor	• LAN	• Not applicable
Remote Supervisor Adapter	• LAN • Over an ASM interconnect	• Remote Supervisor Adapter • Remote Supervisor Adapter II
Remote Supervisor Adapter II	• LAN • Over an ASM interconnect	• Remote Supervisor Adapter • Remote Supervisor Adapter II

See the documentation that came with the server for information about how to configure your service processor and ASM interconnect to ensure that IBM Director Server receives alerts. The IBM Redbooks publication *Implementing Systems Management Solutions Using IBM Director* (SG24-6188-01) also contains information that might be helpful.

Out-of-band alert-forwarding strategies

This topic provides information about the out-of-band alert-forwarding strategies that are supported by xSeries service processors.

The type of service processor also determines what type of alert-forwarding strategy is possible. The following table contains information about possible alert-forwarding strategies.

Table 12. Out-of-band alert-forwarding strategies

Type of service processor	Possible alert-forwarding strategies
ASM PCI adapter	IBM Director over LAN
ASM processor	IBM Director over LAN
ISMP	Not applicable
IPMI baseboard management processor	IBM Director comprehensive
Remote Supervisor Adapter	IBM Director over LAN IBM Director comprehensive
Remote Supervisor Adapter II	IBM Director comprehensive

Some service processors also support SNMP as an alert-forwarding strategy.

Upward integration

Upward integration modules (UIMs) enable third-party workgroup and enterprise systems-management products to interpret and display data that is provided by Level-1 and Level-2 managed systems. The UIMs provide enhancements to the systems-management products that you can use to start IBM Director Agent from within the systems-management platform, collect inventory data, view IBM Director event notifications, and for some UIMs, distribute IBM Director managed system software packages.

With the UIMs, you can use your systems-management software to manage systems installed with IBM Director Core Services or IBM Director Agent software. You can use IBM Director Agent software to:

- Gather detailed inventory information about your systems, including operating system, memory, network adapters, and hardware.
- Track your systems with features such as power management, event log, and system monitor capabilities.

IBM Director Agent uses some of the latest systems-management standards, including Common Information Model (CIM), Web-Based Enterprise Management (WEBM) and Extensible Markup Language (XML), to provide compatibility with your existing enterprise-management software.

IBM Director enables you to make the most of your existing enterprise management structure by upwardly integrating with Tivoli Management Framework, Tivoli NetView, HP OpenView, and Microsoft Systems Management Server (SMS), and Microsoft Operations Manager (MOM).

IBM Director UIM for HP OpenView

With the IBM Director UIM for HP OpenView, you can use your systems-management software to manage systems installed with IBM Director Core Services or IBM Director Agent software.

When you install IBM Director UIM for HP OpenView, the following functions are added to the HP OpenView environment:

- **Event notification**: Provides notification of events that occur on managed systems on which IBM Director Agent is installed. These notifications are delivered using SNMP traps.
- **Inventory**: Scans inventory using an inventory plug-in that starts a Java application that collects the inventory from IBM Director Agent, including Asset ID data, BIOS details, and lease information.
- **Web browser launch**: Provides Web browser capability from within the HP OpenView environment so that you can display and manage real-time asset and health information about managed systems on which IBM Director Agent is installed.
- **Discovery**: Provides SNMP-based discovery of managed systems on which IBM Director Agent is installed.

  Note: You must configure the SNMP community name of the managed system.

IBM Director UIM for Microsoft Operations Manager

With the IBM Director UIM for Microsoft Operations Manager, you can use your systems-management software to manage systems installed with Level-1: IBM Director Core Services or Level-2: IBM Director Agent software.

When you install IBM Director UIM for Microsoft Operations Manager (MOM), the following functions are added to the Microsoft Operations Manager environment:

- **Discovery**: Provides discovery of Level-1 and Level-2 managed systems.
- **Events**: Captures events that occur on Level-1 and Level-2 managed systems.
- **Alerts**: Sends a notification when certain events occur on Level-1 and Level-2 managed systems.
- **State**: Changes the state of Level-1 and Level-2 managed systems based on event criteria.

IBM Director UIM for Microsoft Systems Management Server

With the IBM Director UIM for Microsoft Systems Management Server (SMS), you can use your systems-management software to manage systems installed with IBM Director Core Services or IBM Director Agent software.

When you install IBM Director UIM for SMS, the following functions are added to the SMS environment:

- **Event notification**: Provides notification of events that occur on managed systems on which IBM Director Agent is installed. These notifications are translated into SMS status messages.
- **Collections**: Adds an SMS Collection to easily identify all managed systems on which IBM Director Agent is installed.
- **Inventory**: Scans inventory directly from IBM Director Agent, including Asset ID data, BIOS details, field-replaceable unit (FRU) numbers, lease information, and network details.

  Tip:

  - The inventory feature is compatible only with IBM Director Agent 4.20 or later.
- **Queries**: Adds an SMS Query to identify all managed systems on which IBM Director Agent is installed.
- **Software distribution**: Distributes an IBM Director Agent software package and performs an unattended installation on any system in the Microsoft SMS environment.
- **Wake on LAN®**: Remotely turns on managed systems on which IBM Director Agent is installed, and are Wake-on-LAN-capable.

IBM Director UIM for Tivoli Management Framework

With the IBM Director UIM for Tivoli Management Framework, you can use your systems-management software to manage systems installed with IBM Director Core Services or IBM Director Agent software.

When you install IBM Director UIM for Tivoli Management Framework , the following functions are added to the Tivoli Management Framework environment:

- **Event notification**: Provides notification of events (such as failing components) occurring on IBM Director Agent systems and IBM Management Processors, allowing IT personnel to take immediate corrective action. These notifications can be sent as native Tivoli Enterprise Console events, SNMP traps, and Windows event log events.

- **Inventory**: Collects inventory data directly from IBM Director Agent is installed using custom MIF files, SQL scripts, and inventory queries.
- **Monitors**: Provides hardware status monitors for managed systems on which IBM Director Agent is installed. This feature enhances the Tivoli Console interface by providing a richer set of features and more comprehensive hardware monitoring capabilities. You can monitor hardware status and various thresholds.
- **Software distribution**: Enables you to build and distribute update packages for IBM Director Agent software and perform an unattended installation of these packages on any Tivoli endpoint running Microsoft Windows.
- **Tasks**: Allows you to view additional information and restart or shut down managed systems on which IBM Director Agent is installed remotely using Wake on LAN.

IBM Director UIM for Tivoli NetView

With the IBM Director UIM for Tivoli NetView, you can use your systems-management software to manage systems installed with IBM Director Core Services or IBM Director Agent software.

When you install IBM Director UIM for Tivoli NetView, the following functions are added to the Tivoli NetView environment:

- **Event notification**: Provides notification of events (such as failing components) occurring on IBM Director Agent systems and IBM Management Processors, allowing IT personnel to take immediate corrective action. Notifications are delivered through SNMP traps.
- **Inventory**: Collects the inventory data from IBM Director Agent, including Asset ID data, BIOS details, FRU service numbers, lease information, and network details.
- **Web browser launch**: Provides Web-browser capability from within the NetView environment that allows you to view and manage real-time asset and health information about managed systems on which IBM Director Agent is installed.
- **Discovery**: Automatically finds systems with the IBM Director agent installed, using SNMP. From NetView, you can identify Director agent systems at a glance.

  Note: You must configure the SNMP community name of the managed system.

User interfaces

There are three methods for managing an IBM Director environment: a graphical user interface, called the IBM Director console, a command-line interface (dircli), and a Web-based interface.

IBM Director Console

The IBM Director Console allows you to control and monitor managed systems and devices from an application-based graphical user interface. You can install this console on a desktop computer, workstation, or mobile compute that exists on the same network as the management server.

IBM Director command-line interfaces

You can use the IBM Director the command-line interfaces to manage and monitor the managed objects and devices.

You can use the administrative command-line interface interactively using the **dircli** or **dircmd** utilities. This administrative command-line interface is an important primary interface into IBM Director and may be used either as an efficient way to accomplish simple tasks directly or as an embeddable and scriptable framework for achieving higher level goals. For security reasons, administrative command-line interface runs only on the management server.

Note: The IBM Director **dircli** supports a subset of the commands that were available previously through the deprecated **dircmd** utility.

To access **dircli** or **dircmd** you must log in to an management server as an IBM Director super user. Access to **dircli** and interfaces is limited to IBM Director super-users (members of the DirSuper group). By default, the connection between the CLI client and the management server is a nonsecure TCP/IP data link. You can use Secure Sockets Layer (SSL) to secure the data transmission.

Web-based Access

Web-based Access allows you to view managed system information, change alert standard format (ASF) alerts, change system settings and configurations from a Web-based graphical user interface. When you install Web-based Access on a managed system, you can access IBM Director Agent and view real-time asset and health information about the managed system.

Note: This feature is supported only on Windows 32-bit operating systems.

z/VM Center concepts

This topic provides information about the z/VM Center task and the z/VM environment that z/VM Center manages.

z/VM Center uses the IBM System z9 and @server zSeries virtualization technologies, in particular z/VM, to provision System z9 and zSeries resources in form of z/VM virtual servers. To z/VM, a z/VM virtual server is a guest virtual machine.

A z/VM guest virtual machine consumes a portion of the processor cycles, memory, and I/O bandwidth of the System z9 or zSeries hardware. All operating systems that can run natively on System z9 or zSeries can also run on a z/VM virtual server.

The z/VM Center task comprises two subtasks:

- Virtual Server Deployment
- Server Complexes

What you can do with the z/VM Center tasks

This topic explains what you can do with Virtual Server Deployment and Server Complexes and how they relate.

You can use the z/VM Center subtasks to virtualize your System z9 or zSeries hardware resources into z/VM virtual servers (guest virtual machines) and to deploy Linux instances on them. You interact with z/VM through a graphical user interface that runs on the IBM Director Console. You only have to directly work with z/VM for setting up z/VM Center and to install and set up master Linux instances that serve as the source for the Linux instances you deploy on your z/VM virtual servers.

The Virtual Server Deployment and Server Complexes task complement one another.

Virtual Server Deployment

With the Virtual Server Deployment task, you can define configurations of guest virtual machines and save them as virtual server templates. From a virtual server template you can then create numerous z/VM virtual servers all with the characteristics defined in the template. You can use specially prepared master Linux instances as sources for deploying Linux instances on z/VM virtual servers.

With Virtual Server Deployment you can manage the characteristics of your z/VM virtual servers.

Use the Virtual Server Deployment task to manage individual z/VM virtual servers and operating system instances and to set up templates and Linux guest systems to be used by Server Complexes.

Server Complexes

With the Server Complexes task you can manage configurations of *Linux guest systems*. A Linux guest system is a combination of a Linux instance and the z/VM virtual server on which the Linux instance is installed. A server complex is a configuration profile for Linux guest systems and includes both Linux and z/VM aspects. A server complex can define network settings, Linux configuration scripts, disk access, and VM Resource Manager (VMRM) performance goals.

You can automatically configure a Linux guest system by assigning it to a server complex. You can also create a new Linux guest system within a server complex. When creating a new Linux instance in a server complex, you automatically create a z/VM virtual server with a Linux instance that is configured according to the server complex. For creating a Linux guest system, you require a virtual server template and an operating system template that have been created by the Virtual Server Deployment task.

You can make changes to a server complex and then apply the configuration changes to all Linux instances in the server complex.

Use Server Complexes to manage numerous Linux instances with similar configurations.

System z9 and zSeries virtualization

This topic provides information about the zSeries virtualization technologies.

System z9 and zSeries provide two layers of virtualization:

zSeries LPAR hypervisor

is a virtualization technology built into the System z9 and zSeries hardware. With the LPAR hypervisor, you can divide a System z9 or zSeries mainframe into logical partitions (LPARs). Each LPAR has a dedicated portion of the available physical memory (*central storage*, in System z9 and zSeries terminology). Storage devices, I/O channels, and processors can be shared across LPARs or dedicated to a particular LPAR.

You can use the Integrated Facility for Linux (IFL) feature of the System z9 and zSeries hardware to set up LPARs that are restricted to Linux workloads. Such LPARs have processors that cannot run operating systems other than Linux and z/VM.

z/VM is a System z9 and zSeries operating system that acts as virtualization software. z/VM can run in an LPAR. z/VM can virtualize all system resources, including processors, memory, storage devices, and communication devices.

With z/VM, you can run hundreds of operating system instances concurrently, all on the same System z9 or zSeries hardware.

You can use a number of LPARs to concurrently run multiple instances of z/VM while other LPARs run other mainframe operating systems. Each z/VM can run a multitude of mainframe operating systems, including instances of z/VM itself.

z/VM basics:

This topic gives a brief introduction to z/VM and provides a reference to more information on z/VM.

For more detailed information on z/VM, visit the z/VM 5.1 library at ibm.com/servers/eserver/zseries/zos/bkserv/zvmpdf/zvm51.html or the corresponding z/VM 5.2 library.

The z/VM control program

At the core of the z/VM operating system is the control program (CP). CP is a virtualization layer between the System z9 or zSeries hardware and the z/VM guest virtual machines. CP runs on the System z9 or zSeries machine architecture.

As illustrated in Figure 3, a guest virtual machine is a virtualized System z9 or zSeries machine with a fraction of the actual hardware resources but with the same machine architecture.

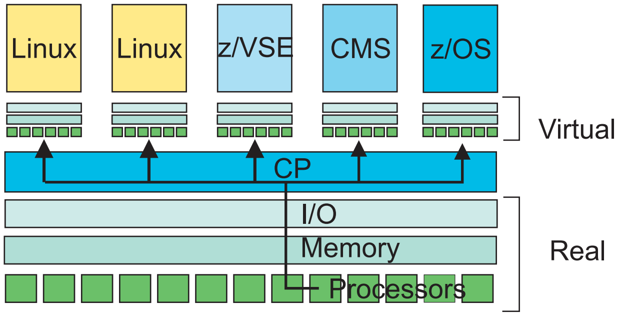


Figure 3. z/VM guest virtual machines

Any operating system or standalone program that can run natively on a System z9 or zSeries machine can also run in a guest virtual machine. To a System z9 or zSeries operating system a guest virtual machine looks like real System z9 or zSeries hardware. An operating system that runs in a z/VM guest virtual machine is called a z/VM guest operating system.

A guest virtual machine runs in the context of a z/VM user ID. With this z/VM user ID you can log on to the virtual hardware. To log on to a Linux guest operating system you do not need the z/VM user ID. You can use your Linux user ID and password, as usual.

The z/VM directory

z/VM uses the z/VM directory to keep track of its guest virtual machines. For each guest virtual machine, there is a directory entry with a number of statements that define its characteristics.

For example, the directory entry defines the processing power, memory size (virtual storage, in z/VM terminology), disk access permissions and other privileges.

The directory is well-protected from general access. There are predefined z/VM users that are privileged to perform administrative functions. Maintaining the directory is among the tasks that require the highest privilege level in z/VM. Many installations use a security manager in addition to this built-in security (see "Security manager" on page 73).

Service machines

z/VM includes a number of service machines. Service machines are guest virtual machines that provide specific services to other guest virtual machines. For example, there are service machines that run programs required for communications or printing. Like all guest virtual machines, service machines are associated with user IDs.

Table 13 shows examples of service machines that are directly relevant to z/VM Center:

Table 13. Examples of service machines

User ID	Purpose
VSMSERVE	This service machine implements the z/VM systems management API. z/VM Center uses it to interact with z/VM and its guest virtual machines.
TCPIP	This service machine runs a TCP/IP stack and defines an IP address through which z/VM can be addressed. z/VM Center accesses VSMSERVE through the IP address provided by TCPIP.
DIRMAINT	This service machine provides an interface for maintaining the z/VM directory. Instead of using DIRMAINT, you can use any directory management program that provides equivalent functions and the required interface.
DATAMOVE	This service machine has privileges to perform disk copy operations. z/VM Center uses DATAMOVE to make copies of disks it requires for setting up new operating system instances and templates.

Note: z/VM is a highly customizable operating system. The user IDs of Table 13 are the standard user IDs for the respective service machines. These IDs can be renamed and might be different on your installation. Your installation might also have multiple instances of a particular service machine, each with a different user ID.

Virtual networking

z/VM allows for a multitude of methods for communication between a guest operating system and another guest operating system on the same z/VM, an operating system instance elsewhere on the same System z9 or zSeries mainframe, or a networked operating system that runs on a separate hardware. For a comprehensive description of z/VM communications refer to *z/VM Connectivity*, SC24-6080.

This section briefly introduces three methods that are particularly relevant to Linux as a guest operating system:

- Direct connections from the z/VM guest virtual machines to an Open Systems Adapter (OSA) card
- Guest LAN
- Virtual switch

You can set up a virtual connection from each guest virtual machine to an OSA card. The OSA card provides a connection to a LAN outside the System z9 or zSeries mainframe. All guest virtual machines that are connected to the same OSA card can also communicate with one another (see Figure 4). *Connecting* in this context does not involve physical cables but means issuing commands that define virtual connections.

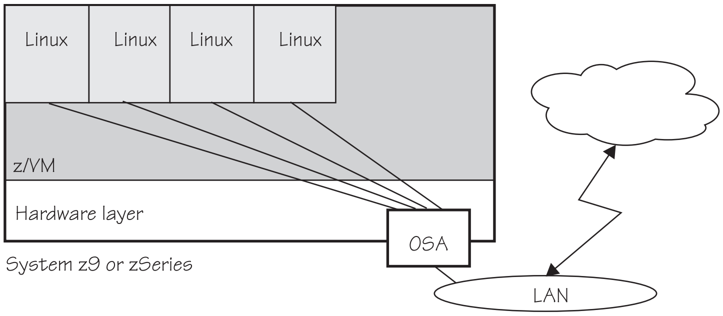


Figure 4. z/VM guest virtual machines directly connected to an OSA card

You can also define a guest LAN. A guest LAN is a virtual LAN, emulated by z/VM. Because a guest LAN does not use physical cables and is contained entirely within the mainframe, it is fast and, if configured correctly, highly secure.

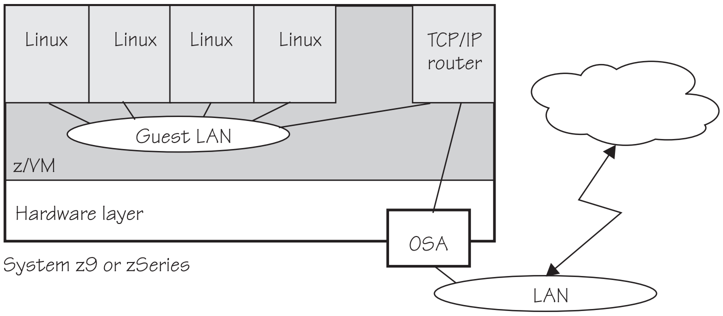


Figure 5. z/VM guest virtual machines connected to a guest LAN

If you want to provide your guest virtual machines with a connection outside the z/VM, you can include a TCP/IP router in your guest LAN (see Figure 5). The router can be a guest virtual machine with a Linux instance as the guest operating system or it can be a TCPIP service machine.

You can also use a virtual switch to connect your guest virtual machines. Like a guest LAN, a virtual switch does not use physical cables and can provide a fast and highly secure connection.

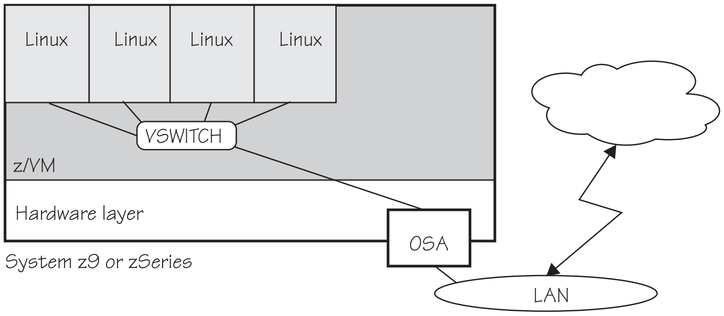


Figure 6. z/VM guest virtual machines connected to a virtual switch

To provide your guest virtual machines with a connection outside the z/VM, you can directly connect the virtual switch to an OSA card (see Figure 6). No router is needed in conjunction with a virtual switch.

Cloning:

This topic explains how copy and personalization techniques can be used to create new instances of guest operating systems.

When z/VM Center creates a new instance of an operating system, it creates a copy of an existing instance. The copy has the same characteristics as the original but instance-specific data is personalized to make the copy a unique instance, rather than a backup of the original. This copying in conjunction with a personalization is called *cloning*.

For example, a cloned Linux instance has the same network interfaces, directory structure, and installed programs as the original, but it has its own unique host name and IP addresses.

Cloning in the Virtual Server Deployment task

With the Virtual Server Deployment task, you do not directly clone operating system instances. You first use cloning to create an operating system template. You then use cloning again to create one or more operating system instances from the template. To create a clone of an operating system instance, you need an existing z/VM virtual server.

Cloning in the Server Complexes task

With the Server Complexes task, you work with z/VM virtual servers that have Linux installed on them. In single cloning operation, you directly create a z/VM virtual server, apply an operating system image to it, and configure it according to the target server complex properties.

For a direct cloning operation you need:

- A server complex that has been created with the Server Complexes task
- A virtual server template that has been created with the Virtual Server Deployment task

- An operating system template that has been created with the Virtual Server Deployment task
- A disk pool to provide the disk resources for the clone

Disk sharing:

Disk sharing can save disk resources.

To z/VM, the disks that a Linux guest operating system can access are minidisks. A minidisk is a logical representation of a part or all of a Direct Access Storage Device (DASD). If multiple operating systems that run on a z/VM require access to the same data, you can share the minidisk where this data resides. When a minidisk is shared, multiple operating system instances can access it.

z/VM Center typically provisions multiple operating system instances that are based on the same master system. Because of the common base, these systems have similar data on the respective system disks. z/VM Center allows the operating system instances to share system disks that:

- Are identical for all operating system instances that need them
- Do not need to be written to

All operating system instances use the same physical copy of a shared minidisks which saves disk space. z/VM ensures data integrity on shared minidisks by restricting access by the operating system instances to read-only.

You can use minidisk sharing most effectively if you set up your master operating systems such as to have the following data on separate minidisks:

- Read-only data
- Read-write and instance specific data

For example, when installing a master Linux you might want to design the file system such that the /etc, /var, and /home directories and any other directories that contain instance-specific data or data that needs to be written to are mounted from a separate minidisk, while the /usr and other directories with fixed data are on a minidisk that can then be shared.

Security manager:

This topic describes considerations if your z/VM installation uses a security manager in addition to the built-in security.

z/VM resources are protected through the access permissions and privileges defined in the z/VM directory. For example, a guest virtual machine cannot access a disk, unless there is a specific or generic directory statement that permits this access.

The directory source file and the facilities to make directory changes take effect are sensitive resources for z/VM security. Accordingly, these resources are well protected in a properly set up z/VM.

In addition to the built-in security, z/VM offers an API for security managers. Many installations use Resource Access Control Facility (RACF®) as their security manager.

If you are using a resource manager in conjunction with z/VM Center, you might need to use the security manager to grant access permissions and privileges for any objects you create with z/VM Center. z/VM Center handles the z/VM directory for you. If your security manager requires additional permissions, you need to define them using your security manager interfaces, outside z/VM Center. Table 14 provides an overview of the objects that you might have to define to your security manager.

Table 14. z/VM Center objects and required security manager definitions

z/VM Center object	z/VM view of the object	Required security manager definitions
z/VM virtual server	A guest virtual machine	• User ID • Optional: Password
Operating system template	A guest virtual machine that cannot be logged on to but owns a number of disks with an install image, that is an installed operating system that is ready to be booted for the first time	• User ID • Optional: Disk access
Operating system instance	A number of disks where an operating system instance resides; if there are shared disks they are owned by the guest virtual machine that corresponds to an operating system template; the remaining disks are owned by the guest virtual machine on which the operating system has been installed	• Access to network interfaces • Optional: Disk access

When you set up your z/VM for z/VM Center, you also create some z/VM guest virtual machines and need to ensure that the security manager grants the required privileges and permits access to the required disks.

Refer to your security manager documentation to find out how to grant a particular access or privilege.

The z/VM manageability access point

The z/VM manageability access point provides a CIM based remote interface for managing z/VM.

The Common Information Model (CIM) is a standard defined by the Distributed Management Task Force (DMTF). The management functions provided at that interface satisfy the CIM profile for z/VM management. Visit dmtf.org for more information on CIM and DMTF.

In terms of z/VM, the z/VM manageability access point is a guest virtual machine that is privileged to use the z/VM systems management API and the z/VM directory manager interface.

In terms of IBM Director, the z/VM manageability access point is a managed object that can be discovered by IBM Director. It is a Linux system that runs in a z/VM guest virtual machine and has IBM Director Agent and implements the CIM profile for z/VM management (z/VM management profile). Figure 7 shows the manageability access point in relation to z/VM.

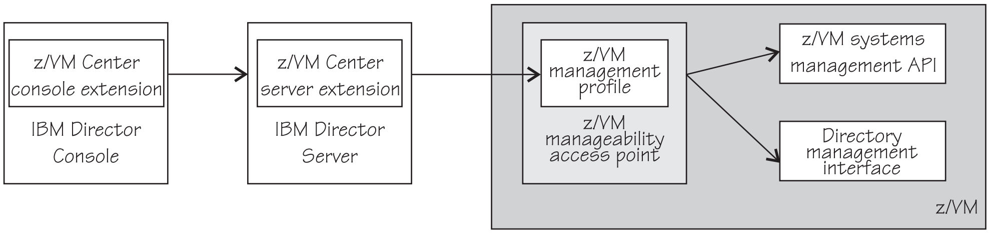

z/VM Center console extension
IBM Director Console
z/VM Center server extension
IBM Director Server
z/VM management profile
z/VM manageability access point
z/VM systems management API
Directory management interface
z/VM

Figure 7. z/VM manageability access point

z/VM Center uses the z/VM management profile to provision systems under z/VM.

To interact with the z/VM manageability access point, you need z/VM Center extension code installed on the IBM Director Console on which you are working and on your IBM Director Server. You can then work with the z/VM Center task on the IBM Director Console. On z/VM, the z/VM manageability access point uses the z/VM systems API and the directory management interface to perform the operations according to the user actions on the IBM Director Console.

The z/VM management profile is not for exclusive use by z/VM Center but is available to any z/VM systems management application.

Virtual Server Deployment concepts

This topic introduces some of the basic concepts of the Virtual Server Deployment task.

z/VM virtual servers and virtual server templates:

All z/VM virtual servers are guest virtual machines but not all guest virtual machines are z/VM virtual servers.

A guest virtual machine is not a z/VM virtual server, if its z/VM directory entry includes a NOLOG statement, that is, if it cannot be logged on.

You use a virtual server template to create a z/VM virtual server. A virtual server template contains configuration data for creating a directory entry for the z/VM virtual server on z/VM. The template relieves you from having to enter all details each time you want to create a z/VM virtual server. You can maintain multiple templates for z/VM virtual servers with different characteristics. Virtual server templates are stored in the CIMOM data repository and are not defined in the z/VM directory.

When creating a z/VM virtual server, the Virtual Server Deployment task uses:

- z/VM defaults. Advanced z/VM users can create their own set of defaults by defining a prototype in the z/VM directory.
- Data from the virtual server template. If you are using a prototype, the data from the virtual server template complements or overrides data from the prototype.
- Data you provide when creating the z/VM virtual server. Data you provide when creating the z/VM virtual server complements or overrides data from the virtual server template.

Once a z/VM virtual server is in place, you can create an operating system instance on it.

Master systems, operating system templates, and personalization:

Master systems are the sources on which Virtual Server Deployment models the operating system instances it creates.

Virtual Server Deployment needs the following to create an operating system instance on a z/VM virtual server:

- An operating system template with a fully configured operating system instance.
- Instance-specific data for the new operating system instance.

Virtual Server Deployment uses cloning techniques to create new operating system instances. You first configure an operating system instance as a model for new operating system instances. To make this operating system instance into a *master operating system instance*, you install a personalization script on it.

When you create a new operating system instance with Virtual Server Deployment, you must specify some instance-specific data. When the newly created operating system instance is started for the first time, the personalization process reads the provided instance-specific data and personalizes the operating system instance accordingly.

Virtual Server Deployment does not clone new operating system instances directly from a master operating system instance. Instead, you create an operating system template. To z/VM, an operating system template is a guest virtual machine that owns disks but cannot be activated. In more general terms, an operating system template can be considered an *install image*.

You can activate the master operating system instance, for example, to make software updates. You can create more than one operating system template from the same master operating system instance.

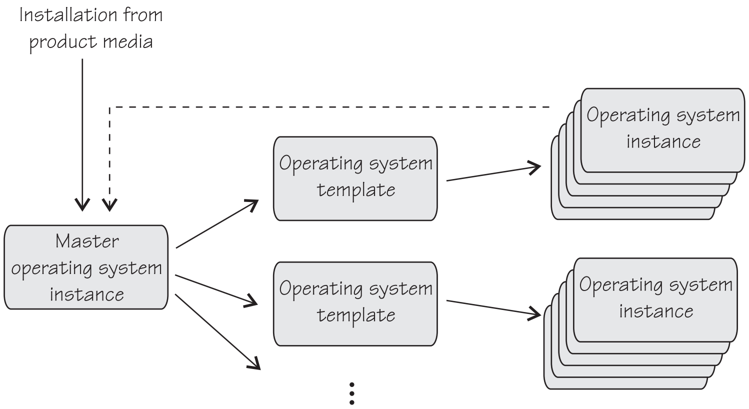

Installation from product media
Operating system instance
Operating system template
Master operating system instance
Operating system template
Operating system instance

Figure 8. Operating system creation flow

As illustrated in Figure 8, you can create one or more operating system templates from a master operating system instance. From each operating system template, you can create one or more operating system instances. The master operating system instance can be from an installation that takes place outside z/VM Center or it can be one of the operating system instances that have been created from an operating system template, within z/VM Center.

At least an initial master operating system instance must have been installed outside z/VM Center.

Registration of operating system instances:

When you register an operating system instance, you provide configuration data about the operating system instance to Virtual Server Deployment.

z/VM Center cannot detect data on the internal configuration of z/VM guest operating system instances. If you have installed an operating system instance outside z/VM Center, you need to provide configuration data about the operating system instance to z/VM Center. This process is called registration. z/VM Center cannot work with operating systems that have been installed outside z/VM Center, unless you register them.

You do not need to register operating system instances that have been created from an operating system template. z/VM Center takes the required configuration data from the template from which they were created.

Regardless of how configuration data on a particular operating system instance has been provided to Virtual Server Deployment—by registration or through a template—z/VM Center cannot detect any changes you might make to that configuration data. If you want to use an instance as a master operating system instance, the actual operating system configuration data must match the data that was registered or taken from an operating system template.

You re-register an operating system instance to make updates to the information z/VM Center holds on an operating system instance.

z/VM Center supports only a single operating system instance on each z/VM virtual server. Before you can create or register a new operating system instance, you must first delete an existing one. De-registering an operating system instance in Virtual Server Deployment only deletes the data Virtual Server Deployment holds on the instance. It does not delete any data on the disks where the instance resides. To delete an operating system instance itself and free the disks where it resides, you can delete the z/VM virtual server on which the instance is installed.

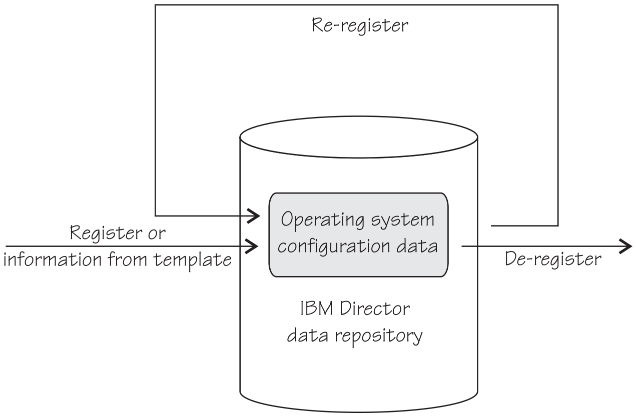


Figure 9. Register, Re-register, and De-register

Figure 9 on page 77 summarizes the relationship between register, re-register, and de-register.

Resource names and descriptions:

The z/VM Center graphical user interface provides fields for names and descriptions that you can assign to objects, such as, templates, z/VM virtual servers, disks, and ports.

z/VM Center reads most of the data on the objects from the z/VM directory. Any descriptions and names that you assign to resources are stored in the CIMOM data repository. As an exception, the virtual server template resides entirely in the CIMOM data repository.

z/VM Center uses definitions from z/VM to establish the association between the data in the CIMOM data repository and the z/VM directory. Be aware that names and descriptions can become dissociated from the actual objects when changes are made directly on z/VM.

Server complexes

This topic introduces some of the basic concepts related to the Server Complexes task.

The Server Complexes task lets you control the configuration of your Linux guest systems in an automatic fashion. Within the context of a managed z/VM, you can create as many server complexes as you need.

You set the properties of a server complex to control various configuration aspects of Linux guest systems. Then, when you add a Linux guest system to a server complex, it is automatically configured according to the properties, taking care of the required configuration in both sides—the underlying z/VM and the Linux operating system itself.

You can also directly create a Linux guest system in a server complex. This way, you get a new Linux guest system configured according to the server complex properties in one action. You can also create and configure multiple Linux guest systems this way in one action.

Before beginning to work with server complexes, you should be familiar with the concepts described here:

Server complex:

A server complex represents a (possibly) multi-tier grouping of Linux guest systems. It governs the creation and configuration of included Linux guest systems by persistent properties.

The supported configuration domains are virtual networking, z/VM minidisk attachments, VM Resource Manager performance goals, and configuration scripts. In each configuration domain, you can define the properties separately for each tier, or for the whole server complex.

Linux guest system:

A Linux guest system is an IBM Director managed object. This object represents a Linux system running as a guest operating system in a z/VM virtual server.

From the point of view of IBM Director, a Linux guest system is simply a managed object that is a Linux system.

Server complex properties:

You configure the properties of a server complex, with the intention that these properties will govern the configuration of Linux guest systems contained in that server complex.

You can configure the properties of a server complex within four domains:

- **Virtual Machine Resource Manager (VMRM) velocity goals** – define the CPU and DASD/IO velocity goals to be monitored and adjusted by the VMRM
- **Virtual networking** – define the virtual networking of the Linux guest systems, based on VM guest LANs, direct OSA attachments, or VSWITCHes
- **Post configuration scripts** – add scripts to be run on Linux guest systems when you add them to, or remove them from, the server complex (or tier)
- **Minidisk attachments** – attach minidisks up to the Linux mount point

You can set the properties for all four configuration domains or for a single one. For example, if you are only interested in VMRM configuration, you can create server complexes and specify their properties only for the VMRM domain. Similarly, you can use them for networking or minidisk management.

For each configuration domain, you can specify the properties for either the whole server complex or for each tier separately.

Inconsistencies in server complexes:

Server complex properties govern the configuration state of the Linux guest systems contained within them. However, there are situations in which the configuration of Linux guest systems is not consistent with the configuration implied by the properties of the server complex containing them.

There are two kinds of situations that may cause a state of inconsistency.

Cause 1: If a user changes configuration properties directly on the managed systems and not through the Server Complexes task functionality.

For example, a user sets the CPU velocity goal property value of a tier to 10 and moves Linux guest systems lnx001, lnx002 (or directly creates them) into the tier. This triggers a VMRM configuration of a workload for that tier and a corresponding CPU velocity goal of 10. Then, the user manually edits the VMRM configuration and changes the velocity goal to 20. This results in an inconsistency.

Cause 2: Configuration failure.

For example, a user changes a property value and applies the reconfiguration on all the Linux guest systems in the server complex (or the tier). However, one Linux guest system is down, so the reconfiguration can not be performed on it. The configuration failure for that Linux guest system is ‘remembered’ according to each configuration domain.

Chapter 2. Planning

This topic contains information about planning to install IBM Director.

Requirements

This topic provides information about IBM Director product requirements.

Hardware requirements

This topic describes the minimum requirements that must be met when you install IBM Director.

Because a system configured with the minimum requirements might perform poorly in a production environment, consider the following suggestions:

- The microprocessor speed, memory, and disk-space minimum requirements are *in addition* to whatever resources are necessary for the software already installed on the system.
- Conduct a performance analysis to ensure that the system has sufficient capacity to handle the additional requirements of functioning as a management server or a management console.

Intel-compatible systems

This topic lists the minimum microprocessor speed, random access memory (RAM), and disk space needed by the IBM Director components on Intel-compatible systems, including iSeries servers, IntelliStation workstations, NetVista desktop computers, IBM ThinkCentre desktop computers, ThinkPad mobile computers, IBM System Storage Network Attached Storage (NAS) products, and IBM SurePOS point-of-sale systems.

When reviewing the hardware requirements, consider the following information:

- The disk space listed is the minimum requirement for an installation using the default selections.
- Requirements listed for IBM Director Server do not include the database program hardware requirements or the increased persistent storage for managed objects.
- The systems on which you install IBM Director Agent or IBM Director Server must meet the Wired for Management (WfM), version 2.0, specifications.
- System Management BIOS (SMBIOS) 2.1 or later is required for all systems in an IBM Director environment.

Table 15. Intel-compatible systems: Minimum hardware requirements

Requirements	IBM Director Core Services	IBM Director Agent	IBM Director Console	IBM Director Server
Microprocessor speed	Pentium-class processor	Pentium-class or Itanium 2 processor	Pentium® 1.5 GHz	Pentium 1.5 GHz
Memory (RAM)	128 MB	128 MB	256 MB	512 MB (minimum) 1024 MB (recommended)
Disk space	40 MB (for Windows) 100 MB (for Linux)	110 MB (for Windows) 165 MB (for Linux)	170 MB	325 MB

Table 15. Intel-compatible systems: Minimum hardware requirements (continued)

Requirements	IBM Director Core Services	IBM Director Agent	IBM Director Console	IBM Director Server
Display	Not applicable	Not applicable	At least 256 colors	At least 256 colors

Servers running AIX

This topic lists the minimum microprocessor speed, random access memory (RAM), and disk space needed by the IBM Director components on servers running AIX, including iSeries and System p5 and pSeries servers, and @server JS20 blade servers.

When reviewing the hardware requirements, consider the following information:

- The disk space listed is the minimum requirement for an installation using the default selections.
- Requirements listed for IBM Director Server do not include the database program hardware requirements or the increased persistent storage for managed objects.
- On systems that do not provide display capability, such as the JS20 blade server, you must export IBM Director Console using either the xhost command or SSH tunneling. The IBM Director Console requirements apply to the receiving system.

Table 16. Servers running AIX: Minimum hardware requirements

Requirements	IBM Director Agent	IBM Director Console	IBM Director Server
Microprocessor speed	Power4 or Power5 1.5 GHz	Power4 or Power5 1.5 GHz	Power4 or Power5 1.5 GHz
Memory (RAM)	512 MB (minimum)	512 MB (minimum)	512 MB (minimum) 1024 MB (recommended)
Disk space	75 MB (/opt) 1 MB (/usr)	170 MB (/opt) [1] 2 MB (/usr)	325 MB (/opt) 2 MB (/usr)
Display	Not applicable	At least 256 colors	At least 256 colors
1. Includes the disk space required for IBM Director Agent.			

Servers running Linux on POWER

This topic lists the minimum microprocessor speed, random access memory (RAM), and disk space needed by the IBM Director components on servers running Linux on POWER, including iSeries and System p5 and pSeries servers, and @server JS20 blade servers.

When reviewing the hardware requirements, consider the following information:

- The disk space listed is the minimum requirement for an installation using the default selections.
- Requirements listed for IBM Director Server do not include the database program hardware requirements or the increased persistent storage for managed objects.
- On systems that do not provide display capability, such as the JS20 blade server, you must export IBM Director Console using either the xhost command or SSH. The IBM Director Console requirements apply to the receiving system.

Table 17. Servers running Linux on POWER: Minimum hardware requirements

Requirements	IBM Director Core Services	IBM Director Agent	IBM Director Console	IBM Director Server
Microprocessor speed	Power4 or Power5 1.5 GHz	Power4 or Power5 1.5 GHz	Power4 or Power5 1.5 GHz	Power4 or Power5 1.5 GHz
Memory (RAM)	128 MB (minimum)	512 MB (minimum)	512 MB (minimum)	512 MB (minimum) 1024 MB (recommended)
Disk space	100 MB	165 MB	170 MB	325 MB
Display	Not applicable	Not applicable	At least 256 colors	At least 256 colors

iSeries servers

This topic lists the minimum commercial processing workload (CPW), storage pool size, and disk space needed by the IBM Director components.

Table 18. iSeries servers: Minimum hardware requirements

Requirements	IBM Director Agent	IBM Director Server
Relative system performance	75 CPW	150 CPW
Storage pool size	350 MB	500 MB
Disk space	300 MB	500 MB

IBM System z9 and zSeries servers

This topic lists the minimum microprocessor speed, random access memory (RAM), and disk space needed by the IBM Director components.

Table 19. Minimum hardware requirements for IBM Director on System z9 and zSeries servers

Requirement	IBM Director Server (with or without CIM instrumentation for manageability access point)	IBM Director Console	IBM Director Agent	IBM Director Agent with CIM instrumentation for manageability access point
Processor speed	All processor speeds provided by IBM System z9 and zSeries servers are sufficient for IBM Director.			
Memory	1 GB	256 MB	256 MB	512 MB
Disk space	316 MB	168 MB	43-109 MB	215 MB
Display	Not applicable	At least 256 colors	Not applicable	Not applicable

Which additional resources you require for the systems you want to provision with z/VM Center depends on the number and nature of the provisioned systems. The requirements of the provisioned systems, including networking requirements, are the same as if you were to set them up without z/VM Center. Refer to the z/VM Planning information for further details.

Alert Standard Format-capable systems supported by IBM Director 5.10

Alert Standard Format (ASF) defines remote control and alerting interfaces in an environment that does not have an operating system, on servers with ASF-capable network interface cards (NICs).

The following servers have ASF-capable network interface cards (NICs).

- xSeries 206
- xSeries 226
- xSeries 235
- xSeries 255
- xSeries 306
- xSeries 335
- xSeries 345
- IntelliStation A10
- IntelliStation M20
- IntelliStation M30
- IntelliStation M40
- IntelliStation Z20

Network requirements

This section discusses supported network protocols and the ports used in an IBM Director environment.

Network protocols

This topic lists the network protocols that can be used in an IBM Director environment.

The following table lists the versions of network protocols that can be used in an IBM Director environment.

Table 20. Supported versions of network protocols

Protocol	Supported version
IPX	IPX versions supported by NetWare and Windows
NetBIOS	Native NetBIOS versions supported by Windows
TCP/IP	All WinSock-compatible versions of TCP/IP version 4.0 supported by AIX, i5/OS, Linux, NetWare, and Windows

Some network protocols are supported only for certain types of data transmissions or on certain operating systems. The following table contains additional information.

Table 21. Types of data transmission and supported network protocols

Type of data transmission	Operating system running on managed system	Supported network protocols
IBM Director Server ↔ IBM Director Console	Not applicable	TCP/IP
IBM Director Server ↔ SNMP devices	Not applicable	TCP/IP
IBM Director Server ↔ IBM Director Agent	AIX	TCP/IP
IBM Director Server ↔ IBM Director Agent	i5/OS	TCP/IP
IBM Director Server ↔ IBM Director Agent	Linux	TCP/IP
IBM Director Server ↔ IBM Director Agent	NetWare	IPX or TCP/IP
IBM Director Server ↔ IBM Director Agent	Windows	IPX, NetBIOS, or TCP/IP

Ports

This topic lists the ports used in an IBM Director environment.

The abbreviations that appear in this table are spelled out below the table.

Note: In the Connection column, the component to the left of the arrow indicates the *Initiator* of the communication and the component to the right of the arrow indicates the *Listener* or receiver of the communication.

For the TCP ports listed, the *Initiator* opens a random port in the 1024-65535 range and then connects to the *Listener* on the port listed in the Destination Port column. When the *Listener* responds, it connects back to the random port in the 1024-65535 range opened by the *Initiator*. For example, if the entry in the Connection column is IBM Director Console → IBM Director Server, then IBM Director Console is the Initiator and IBM Director Server is the Listener.

Table 22. Ports used by IBM Director

Category	Connection	Destination port
IBM Director interprocess communication	IBM Director Server ↔ IBM Director Agent	14247 UDP and TCP[1]; 14248 TCP; 4490 IPX (read); 4491 IPX (write)
	IBM Director Console → IBM Director Server	2033 TCP
	DIRCLI client ↔ IBM Director Server	2044 TCP
	DIRCMD client ↔ IBM Director Server	2034 TCP
	IBM Director Console → IBM Director Console	Any free port (for use of BladeCenter Switch Management launch pad)
	IBM Director Console → IBM Director Server over SSL; DIRCLI client ↔ IBM Director Server	4066 TCP
IBM Director Web-based Access	Web Browser → IBM Director Agent Web Server	411 TCP (HTTP) Configurable at installation[1]
	Web Browser → IBM Director Agent Web Server	423 TCP (HTTPS) Configurable at installation[1]
	IBM Director Agent Web Server → IBM Director Agent Web Server	8009 TCP (loopback)
CIM-XML over HTTP[2]	IBM Director Server → Level-1 or Level-2 managed system, or SMI-S storage device	5988 TCP
CIM-XML over HTTPS[2]	IBM Director Server → Level-1 or Level-2 managed system, or SMI-S storage device	5989 TCP
HTTP	IBM Director Server → BladeCenter switch module	80 TCP
Microsoft Windows DCOM	IBM Director Server → Level-0 system	137 UDP; 138 UDP; 139 TCP; 445 TCP
ServeRAID interprocess communication	ServeRAID CIM Provider → ServeRAID Manager	34572 TCP

Table 22. Ports used by IBM Director (continued)

Category	Connection	Destination port
Service processors	IBM Director Server ↔ service processor	6090 TCP
	Service processor → IBM Director Server (alerts)	13991 UDP
	IBM Director Server → service processor (ASF, ASF 2.0, and IPMI)	623 and 664 UDP
	Service processor → IBM Director Server (ASF, ASF 2.0, and IPMI)	Random port in the 1024-65535 range[3]
SLP	IBM Director Server ↔ SLP service agents or SLP directory agents	427 TCP and UDP
SNMP	IBM Director Server → SNMP agent	161 TCP and UDP[1]
	SNMP agent → IBM Director Server	162 TCP and UDP[1]
SSH	IBM Director Server → SNMP devices (Remote Session task)	22 TCP
	IBM Director Server → Level-0 system	22 TCP
Telnet	IBM Director Server → BladeCenter management module	23 TCP
	IBM Director Server → BladeCenter switch module	23 TCP
	IBM Director Server → SNMP devices (Remote Session task)	23 TCP

Abbreviations:
- ASF = Alert Standard Format
- HTTP = Hypertext Transfer Protocol
- HTTPS = Hypertext Transfer Protocol Secure
- IPMI= Intelligent Platform Management Interface
- SLP = Service Location Protocol
- SNMP = Simple Network Management Protocol
- SSH = Secure Shell
- SSL = Secure Sockets Layer
- TCP = Transmission Control Protocol
- UDP = User Datagram Protocol

Supported operating systems

This section lists the operating systems on which IBM Director Server, IBM Director Console, IBM Director Agent, and IBM Director Core Services are supported.

For the most recent list of supported operating systems, see *IBM Director Hardware and Software Compatibility*. You can download it from www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

[1] (Windows XP Professional Edition with Service Pack 2 only) You must enable these ports for IBM Director to function properly.

[2] The HTTP port must be turned on for the Pegasus CIMOM, regardless of whether or not HTTPS is turned on (SSL is enabled) for any CIM-related functionality of the Level-2 agent to work.

[3] You can specify a fixed port by modifying the asmDefinitions.properties file, which is in the data directory.

Operating systems supported by IBM Director Server

This topic lists the operating systems on which you can install IBM Director Server.

Depending on your server model, you can install IBM Director Server on the following operating systems.

xSeries servers

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86

  Note: For systems that contain an AMD Opteron or Athlon64 processor, Update 5 is required.
- Red Hat Enterprise Linux AS and ES, version 4.0, for AMD64 and EM64T
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 9 for AMD64 and EM64T
- SUSE LINUX Enterprise Server 9 for x86
- Windows 2000, Advanced Server and Server Editions
- Windows Server 2003, Enterprise, Standard, and Web Editions
- Windows Server 2003, Enterprise, Standard, and Web x64 Editions

iSeries servers

- AIX 5L, Version 5.3
- i5/OS, Version 5 Release 3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System p5 and pSeries servers

- AIX 5L, Version 5.3
- i5/OS, Version 5 Release 3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System z9 and zSeries servers

- 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

Operating systems supported by Level-2, Level-1, and Level-0 managed systems

This topic lists the operating systems on which you can install IBM Director Agent and IBM Director Core Services, as well as the operating systems for which IBM Director provides Level-0 system-management support.

Note: Unless stated otherwise, all of the listed operating systems are supported by IBM Director Agent, IBM Director Core Services, and Level-0 system management.

xSeries servers and Intel-compatible systems (32-bit operating systems)

- Novell NetWare, version 6.5

  Note: IBM Director does not provide Level-0 support for NetWare.

- Red Hat Enterprise Linux AS, ES, and WS, version 3.0

  Note: (Level-2 and Level-1 support only) For systems that contain an AMD Opteron or Athlon64 processor, Update 5 is required.
- 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, version 2.1, with the following guest operating systems:
  - Red Hat Enterprise Linux AS, ES, and WS, version 3.0
  - SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
- VMware ESX Server, version 2.5, with the following guest operating systems:
  - Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 3 required)
  - SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
  - SUSE LINUX Enterprise Server 9 for x86
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
  - Windows XP Professional Edition (Service Packs 1 and 2 required)
- VMware ESX Server, version 2.51, with the following guest operating systems:
  - Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 4 required)
  - SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
  - SUSE LINUX Enterprise Server 9 for x86 (Service Pack 1 required)
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
  - Windows XP Professional Edition (Service Packs 1 and 2 required)
- VMware GSX Server, version 3.1, with the following support:

Guest operating systems	• Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 4 required) • SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required) • Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required) • Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
Host operating systems supported on 32-bit systems	• Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Stock 2.4.21-4, Update 2.4.21-9, 2.4.21-9.0.1, 2.4.21-15, 2.4.21-27.EL kernels required) • SUSE LINUX Enterprise Server 8 for x86 (Stock 2.4.19, Update 2.4.21-138, 2.4.21-143, 2.4.21-215 and Patch 3 kernels required) • Windows 2000, Advanced Server and Server Editions (Service Packs 3 or later required) • Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
Host operating systems supported on 64-bit systems	Windows Server 2003, Enterprise, Standard, and Web x64 Editions (Service Pack 1 required)

- VMware GSX Server, version 3.2, with the following support:

Guest operating systems	• Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 3 required) • Red Hat Enterprise Linux AS, ES, and WS, version 4.0 (Updates 1 and 2 required) • SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required) • SUSE LINUX Enterprise Server 9 for x86 (Service Pack 1 required) • Windows 2000, Advanced Server and Server Editions (Service Pack 3 or later required) • Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required) • Windows XP Professional Edition (Service Packs 1 and 2 required)
Host operating systems supported on 32-bit systems	• Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Stock 2.4.21-4, Update 2.4.21-9, 2.4.21-9.0.1, 2.4.21-15, 2.4.21-27.EL kernels required) • Red Hat Enterprise Linux AS, ES, and WS, version 4.0 (Stock 2.6.9-5.EL kernel required) • SUSE LINUX Enterprise Server 8 for x86 (Stock 2.4.19, Update 2.4.21-138, 2.4.21-143, 2.4.21-215 and Patch 3 kernels required) • SUSE LINUX Enterprise Server 9 for x86 (Stock 2.6.5-7.97 kernel, Service Pack 1 2.6.5-7.139 kernel required) • Windows 2000, Advanced Server and Server Editions (Service Packs 3 or later required) • Windows Server 2003, Enterprise, Standard, and Web Editions (Service Pack 1 required)
Host operating systems supported on 64-bit systems	Windows Server 2003, Enterprise, Standard, and Web x64 Editions (Service Pack 1 required)

- Microsoft Virtual Server 2005 with the following guest operating systems:
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or 4 required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions
- Microsoft Virtual Server 2005 (Service Pack 1) with the following guest operating systems:
  - Windows 2000, Advanced Server and Server Editions (Service Pack 3 or 4 required)
  - Windows Server 2003, Enterprise, Standard, and Web Editions
  - Windows Server 2003, Enterprise, Standard, and Web x64 Editions
  - Windows XP Professional Edition (Service Pack 2 required)
  - Windows XP Professional x64 Edition
- Windows 2000, Advanced Server, Datacenter, Professional, and Server Editions
- Windows Server 2003, Datacenter, Enterprise, Standard, and Web Editions
- Windows XP Professional Edition

xSeries servers and Intel-compatible systems (64-bit operating systems)

- Red Hat Enterprise Linux AS, ES, and WS, version 3.0, for AMD64 and EM64T
- Red Hat Enterprise Linux AS, version 3.0, for Intel Itanium
- Red Hat Enterprise Linux AS, ES, and WS, version 4.0, for AMD64 and EM64T
- 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
- Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions
- Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions
- Windows XP Professional x64 Edition

iSeries servers

IBM Director provides Level-2 support for the following operating systems. Level-0 support includes Discovery, Remote Session and a limited subset of the Software Distribution task.

- AIX 5L, Version 5.2
- AIX 5L, Version 5.3
- i5/OS, Version 5 Release 3

IBM Director provides Level-2, Level-1, and Level-0 support for the following operating systems:

- Red Hat Enterprise Linux AS, version 3.0, 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

iSeries servers with xSeries options

iSeries server installations can use the following xSeries options:

- Integrated xSeries Server (ISX)
- xSeries servers that are attached to the iSeries servers via the Integrated xSeries Adapter (IXA)

Using these xSeries options, you can install IBM Director Agent and IBM Director Core Services on the following operating systems:

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 9 for x86
- Windows 2000, Advanced Server and Server Editions
- Windows Server 2003, Enterprise, Standard, and Web Editions

Note: Whether these operating systems are supported in your iSeries environment depends on the following criteria:

- The Integrated xSeries Server (ISX) installed in the iSeries server
- The xSeries server that is attached to the iSeries server via the Integrated xSeries Adapter (IXA)
- The release of i5/OS or OS/400 installed on the iSeries server

For more information, see *IBM Director Hardware and Software Compatibility*. You can download this document from www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

System p5 and pSeries servers

IBM Director provides Level-2 support for the following operating systems. Level-0 support is includes Discovery, Remote Session and limited subset of the Software Distribution task.

- AIX 5L, Version 5.2
- AIX 5L, Version 5.3

- i5/OS, Version 5 Release 3

IBM Director provides Level-2, Level-1, and Level-0 support for the following operating systems:

- Red Hat Enterprise Linux AS, version 3.3, 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

System z9 and zSeries servers

IBM Director provides Level-2, Level-1, and Level-0 support for the following operating systems:

- 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

Operating systems supported by IBM Director Console

This topic lists the operating systems on which you can install IBM Director Console.

Depending on your system model, you can install IBM Director Console on the following operating systems.

xSeries servers

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86

  Note: For systems that contain an AMD Opteron or Athlon64 processor, Update 5 is required.
- Red Hat Enterprise Linux AS and ES, version 4.0, for AMD64 and EM64T
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 9 for AMD64 and EM64T
- SUSE LINUX Enterprise Server 9 for x86
- Windows 2000, Advanced Server, Professional, and Server Editions
- Windows XP Professional Edition
- Windows Server 2003, Enterprise, Standard, and Web Editions
- Windows Server 2003, Enterprise, Standard, and Web x64 Editions

iSeries servers

- AIX 5L, Version 5.3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System p5 and pSeries servers

- AIX 5L, Version 5.3
- Red Hat Enterprise Linux AS, version 4.0, for IBM POWER
- SUSE LINUX Enterprise Server 9 for IBM POWER

System z9 and zSeries servers

- 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

Operating systems supported by IBM Director tasks

This section lists the operating systems upon which IBM Director tasks are supported.

Support for IBM Director tasks can vary depending on the following items:

- The managed object hardware
- The operating system that is installed on a managed object
- The service processor installed in the managed object
- The level of the device drivers that are installed on the managed object

Note: The device drivers that are available for a managed object depend on the service processor and operating system that are installed on the managed object.

For information about what hardware features are supported on IBM xSeries, BladeCenter, or IntelliStation hardware or what operating systems are supported on IBM xSeries, BladeCenter, or IntelliStation hardware, go to the IBM ServerProven Web site at www.ibm.com/pc/us/compat/index.html.

Operating systems supported by Asset ID

This topic provides information about the operating systems supported by the Asset ID task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 23. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No
Versions of Linux for 32-bit systems:	

Table 23. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 2
• 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:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • 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	No

Table 24. 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	No
• 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	Yes

Table 25. 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

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 26. 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:	
• 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 27. 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 28. 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

Operating systems supported by the CIM Browser

This topic provides information about the operating systems supported by the CIM Browser task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 29. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No
Versions of Linux for 32-bit systems:	

Table 29. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	**Level 2**
• 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:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • 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	No

Table 30. 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	Yes

Table 31. 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	Yes

Operating systems supported by Configuration Manager

This topic provides information about the operating systems and the IBM Director managed-system levels supported by the Server Configuration Manager and BladeCenter Configuration Manager.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

Managed-object support

This task does not require IBM Director Agent version 5.10 or IBM Director Core Services version 5.10 to function. The task is a function of IBM Director Server. You can use this task on IBM xSeries and iSeries hardware managed objects. The operating system running on the managed object does not affect the support of this task.

The Server Configuration Manager performs IP configuration using out-of-band communication.

Operating systems supported by Configure Alert Standard Format

This topic provides information about the operating systems supported by the Configure Alert Standard Format task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 32. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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 GSX Server, versions 3.1 and 3.2, Console	Yes
• VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	No

Table 32. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 2
Versions of Linux for 64-bit systems:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	No
NetWare, version 6.5	No

Table 33. 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 34. 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

Operating systems supported by Configure SNMP Agent

This topic provides information about the operating systems supported by the Configure SNMP Agent task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 35. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
• 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:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • 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	No

Table 36. 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	Yes

Table 37. 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	Yes

Operating systems supported by Event Log

This topic provides information about the operating systems supported by the Event Log task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-1 and Level-2 managed systems.

Table 38. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 1	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	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	Yes	Yes
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	Yes
Versions of Linux for 64-bit systems:		

Table 38. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 1	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	Yes	Yes
Other operating systems supported by xSeries servers:		
Microsoft Virtual Server (guest operating system)	Yes	Yes
NetWare, version 6.5	Yes	Yes

Table 39. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 1	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	Yes	Yes

Table 40. Operating systems supported by System z9 and zSeries servers

Operating system	Level 1	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	Yes	Yes

Operating systems supported by External Application Launch

This topic provides information about the operating systems supported by the External Application Launch task.

Management-server support

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

- Linux
- 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. Managed-object support for this task varies by the application that you add to the IBM Director Console Tasks pane.

Table 41. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	No

Table 42. 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	No
• 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	Yes

Table 43. 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	Yes

Operating systems supported by File Transfer

This topic provides information about the operating systems supported by the File Transfer task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Note: (VMware ESX Server and VMware GSX Server only) File systems that are displayed for the guest operating system are limited to file systems within its virtual disk.

Table 44. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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 44. Operating systems supported by xSeries servers and third-party Intel-based systems (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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 45. 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	Yes

Table 46. 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	Yes

Operating systems supported by the Hardware Management Console task

This topic provides information about the operating systems supported by the Hardware Management Console task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

Managed-object support

This task is supported only on an HMC managed object. The HMC is a closed system that includes an embedded Linux distribution.

Note: You must install V5R2 or later for this task to function.

Operating systems supported by Hardware Status

This topic provides information about the operating systems supported by the Hardware Status task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-1 and Level-2 managed systems.

Unless otherwise indicated, this task is supported (although the support might be limited) by:

- Out-of-band notifications generated by a service processor
- CIM indications generated by IBM Director Core Services or IBM Director Agent, Version 5.10

Table 47. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	**Level 1**	**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	Yes
Editions of Windows for 64-bit systems:		
• Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions • Windows XP Professional x64 Edition	Yes	Yes
Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No	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	Yes	Yes[1]
VMware ESX Server, versions 2.1, 2.5, and 2.51, Console	Yes[1]	Yes[1]
VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems	Limited	Limited
• VMware GSX Server, versions 3.1 and 3.2, Console • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	(For Console) Yes[1] (For guest) Limited	(For Console) Yes[1] (For guest) Limited
Versions of Linux for 64-bit systems:		

Table 47. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 1	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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes	Yes [1]
• 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 Itanium Processor Family • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No	No
Other operating systems supported by xSeries servers:		
Microsoft Virtual Server (guest operating system)	Limited	Limited
NetWare, version 6.5	Yes [2]	Yes [3]
1. Out-of-band notifications generated by a service processor or in-band events generated by CIM (CIM support is system specific). 2. Out-of-band notifications generated by a service processor only. 3. In-band events generated by IBM Director Agent for NetWare, Version 5.1 or earlier, or out-of-band notifications generated by a service processor.		

Table 48. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 1	Level 2
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3	No	No
i5/OS, Version 5 Release 3	No	Yes[1]
• 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	Yes[1]	Yes[1]
1. (BladeCenter JS20 only) Out-of-band notifications generated by a service processor only.		

Table 49. Operating systems supported by System z9 and zSeries servers

Operating system	Level 1	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	No

Operating systems supported by Inventory (hardware)

This topic provides information about the operating systems and the IBM Director managed-system levels supported by the Inventory task when collecting hardware inventory.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-0, Level-1 and Level-2 managed systems. However, the inventory data provided can vary among Level-0, Level-1 and Level-2 managed systems.

Table 50. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	**Level 0**	**Level 1**	**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	Yes	Yes
Editions of Windows for 64-bit systems:			
• Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions • Windows XP Professional x64 Edition	Yes	Yes	Yes
Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No	No	Yes[1]
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, version 2.1 Console • VMware ESX Server, version 2.1 guest operating systems • VMware ESX Server, version 2.5 Console • VMware ESX Server, version 2.5 guest operating systems • VMware ESX Server, version 2.51 Console • VMware ESX Server, version 2.51 guest operating systems • VMware GSX Server, version 3.1 Console • VMware GSX Server, version 3.1 guest operating systems • VMware GSX Server, version 3.2 Console • VMware GSX Server, version 3.2 guest operating systems	Yes	Yes	Yes
Versions of Linux for 64-bit systems:			
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes	Yes	Yes
• 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 Itanium Processor Family • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No	No	Yes[1]
Other operating systems supported by xSeries servers:			
Microsoft Virtual Server (guest operating system)	Yes	Yes	Yes

Table 50. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 0	Level 1	Level 2
NetWare, version 6.5	No	No	Yes[1]
1. Platform-specific data is not available for hardware inventory.			

Table 51. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 0	Level 1	Level 2
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • i5/OS, Version 5 Release 3	No	No	Yes[1]
• 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	Yes	Yes	Yes
1. Platform-specific data is not available for hardware inventory.			

Table 52. Operating systems supported by System z9 and zSeries servers

Operating system	Level 0	Level 1	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	Yes	Yes	Yes

Operating systems supported by Inventory (software)

This topic provides information about the operating systems and the IBM Director managed-system levels supported by the Inventory task when collecting software inventory.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-0, Level-1 and Level-2 managed systems.

Table 53. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 0	Level 1	Level 2
Editions of Windows for 32-bit systems:			

Table 53. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 0	Level 1	Level 2
• Windows 2000, Advanced Server, Datacenter, Professional, and Server Editions • Windows XP Professional Edition • Windows Server 2003, Datacenter, Enterprise, Standard, and Web Editions	Yes	Yes	Yes
Editions of Windows for 64-bit systems:			
• Windows Server 2003, Datacenter, Enterprise, Standard, and Web x64 Editions • Windows XP Professional x64 Edition	Yes	Yes	Yes
Windows Server 2003, Datacenter and Enterprise 64-bit Itanium Editions	No	No	Yes
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, version 2.1 Console • VMware ESX Server, version 2.1 guest operating systems • VMware ESX Server, version 2.5 Console • VMware ESX Server, version 2.5 guest operating systems • VMware ESX Server, version 2.51 Console • VMware ESX Server, version 2.51 guest operating systems • VMware GSX Server, version 3.1 Console • VMware GSX Server, version 3.1 guest operating systems • VMware GSX Server, version 3.2 Console • VMware GSX Server, version 3.2 guest operating systems	Yes	Yes	Yes
Versions of Linux for 64-bit systems:			
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes	Yes	Yes
• 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 Itanium Processor Family • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No	No	Yes
Other operating systems supported by xSeries servers:			
Microsoft Virtual Server (guest operating system)	Yes	Yes	Yes
NetWare, version 6.5	No	No	Yes

Table 54. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 0	Level 1	Level 2
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • i5/OS, Version 5 Release 3	No	No	No

Table 54. Operating systems supported by iSeries servers and System p5 and pSeries servers (continued)

Operating system	Level 0	Level 1	Level 2
• 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	Yes	Yes	Yes

Table 55. Operating systems supported by System z9 and zSeries servers

Operating system	Level 0	Level 1	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	Yes	Yes	Yes

Operating systems supported by Microsoft Cluster Browser

This topic provides information about the operating systems supported by the Microsoft Cluster Browser task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 56. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 2
Editions of Windows for 32-bit systems:	
• Windows 2000, Advanced Server, Datacenter, and Server Editions • Windows Server 2003, Datacenter, Enterprise, Standard, and Web Editions	Yes
• Windows 2000 Professional Edition • Windows XP Professional Edition	No
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:	

Table 56. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 2
• 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	No
Versions of Linux for 64-bit systems:	
• 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)	No
NetWare, version 6.5	No

Table 57. 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 58. 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

Operating systems supported by Network Configuration

This topic provides information about the operating systems supported by the Network Configuration task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 59. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • 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	No

Table 60. 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 • 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
i5/OS, Version 5 Release 3	Yes

Table 61. 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	Yes

Operating systems supported by Power Management

This topic provides information about the Power Management task and the criteria that managed systems must meet for the Power Management task to work.

The Power Management task is provided using the right-click feature on managed objects in IBM Director Console. Power Management support is provided through one or more of the hardware or software:

- A service processor configured for out-of-band communication
- Alert Standard Format (ASF)
- Operating system
- Wake on LAN network interface card (NIC)

Note: IBM Director Server also provides Power Management support for the following versions of IBM Director Agent with the MPA Agent feature installed:

- 4.22
- 4.21
- 4.20.2
- 4.20
- 4.12
- 4.11
- 4.10.2
- 4.10

For information about this support, see the *IBM Director 4.20 Systems Management Guide*.

Power Management-support provided by Alert Standard Format:

Support for the Power Management task can be provided by xSeries servers that are ASF 2.0-capable systems.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

Managed-object support

ASF provides the Power On, Restart Now, and Power Off subtasks. The following table lists the operating systems on which ASF 2.0-capable IBM xSeries servers provide support for the Power Management task. To provide power-management support, systems must meet the following criteria:

- An ASF 2.0-capable NIC must be installed in the managed system. These systems include:
  - xSeries 206
  - xSeries 226
  - xSeries 306
  - IntelliStation M Pro (Types 6218, 6225, and 6228)
  - IntelliStation Z Pro (Types 6222, 6223, and 6227)
- ASF must be configured on the system for power management.
- IBM Director Core Services or IBM Director Agent, version 5.10, must be installed on the system.

Table 62. Operating systems supported by xSeries servers and third-party Intel-based systems

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 [1]
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	Yes [2]
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 [3]
Versions of Linux for 64-bit systems:	
• 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	Yes [4]

Table 62. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 2
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes [1, 2]
NetWare, version 6.5	No

1. Power-management support on editions of Windows for 32-bit systems is provided by the following system models: xSeries 206, xSeries 226, xSeries 306, IntelliStation M Pro (Types 6218, 6225, and 6228) and IntelliStation Z Pro (Types 6222, 6223, and 6227).
2. Power-management support on editions of Windows for 64-bit systems is provided by the following system models: xSeries 226 and IntelliStation M Pro (Type 6218).
3. Power-management support on versions of Linux for 32-bit systems is provided by the following system models: xSeries 206, xSeries 226, xSeries 306, and IntelliStation M Pro (Type 6218).
4. Power-management support on versions of Linux for 64-bit systems is provided by the following system models: xSeries 226 and IntelliStation M Pro (Type 6218).

Power Management-support provided by operating systems:

Support for the Power Management task can be provided by the operating system running on Level-0, Level-1, and Level-2 managed systems.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 63. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Supported
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, Restart and Shutdown
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	Yes, Restart and Shutdown
Versions of Linux for 32-bit systems:	

Table 63. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Supported
• 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 GSX Server, versions 3.1 and 3.2, Console	Yes, Restart
• VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	Yes, Restart (for Linux) and Restart and Shutdown (for Windows)
Versions of Linux for 64-bit systems:	
• 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	Yes, Restart
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes, Restart and Shutdown
NetWare, version 6.5	No

Note: (For System p5 and pSeries servers only) Power Management-support provided only for Level-2 managed systems.

Table 64. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Supported
i5/OS, Version 5 Release 3	No [1]
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • 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	Yes, Restart
1. Power-management support is available to Level-2 managed systems running i5/OS and SSH. To acquire this support, discover the managed system, log in to the system, and promote the system to a Level-2 managed system.	

Table 65. Operating systems supported by System z9 and zSeries servers

Operating system	Supported
• 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	Yes, Restart

Power Management-support provided by service processors:

Support for the Power Management task can be provided by xSeries service processors that can communicate out of band.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

Managed-object support

The following service processors in IBM xSeries servers and @server blade servers provide support for the Power Management task using out-of-band communication:

- Remote Supervisor Adapter
- Remote Supervisor Adapter II
- IPMI baseboard management controller

These service processors provide support for the Power On, Restart Now, and Power Off Now subtasks. Out-of-band communication does not require IBM Director Core Services or IBM Director Agent, version 5.10. However, you must configure the service processor to communicate with IBM Director Server. Also, you must associate a Physical Platform managed object (PPMO) with the service processor in IBM Director Console.

Power Management-support provided by the Wake on LAN feature:

Support for the Power Management task can be provided by xSeries servers that have the Wake on LAN feature enabled. These servers can be Level-0, Level-1, or Level-2 managed systems.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

Managed-object support

Wake on LAN provides the Power On subtask only. In order to use Wake on LAN-provided power management, the following criteria must be met:

- The system must include a network interface card (NIC) that is Wake on LAN-capable.
- The Wake on LAN feature must be enabled.
- IBM Director Server can detect the MAC address of a Level-0, Level-1, or Level-2 managed system.
- The managed system data is included in the IBM Director inventory tables.

- The managed system is running an operating system that supports the Wake on LAN feature. See the following table for details.

Table 66. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Supported
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	Yes
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	Yes
• 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	No
Versions of Linux for 64-bit systems:	
• 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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	No
NetWare, version 6.5	Yes

Operating systems supported by Process Management

This topic provides information about the operating systems supported by the Process Management task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 67. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 68. 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	Yes

Table 69. 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	Yes

Operating systems supported by Rack Manager

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

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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 systems must be xSeries and Netfinity servers.

Table 70. 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 70. 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 71. 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 72. 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

Operating systems supported by Remote Control

This topic provides information about the operating systems supported by the Remote Control task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 73. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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 GSX Server, versions 3.1 and 3.2, Console	No
• VMware ESX Server, versions 2.1, 2.5, and 2.51, guest operating systems • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	Windows only
Versions of Linux for 64-bit systems:	
• 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	No

Table 74. 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 75. 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

Operating systems supported by Remote Session

This topic provides information about the operating systems supported by the Remote Session task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

The Remote Session task works on any SNMP device that has either Secure Shell (SSH) or Telnet server installed and running.

Table 76. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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 76. Operating systems supported by xSeries servers and third-party Intel-based systems (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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 77. 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	Yes

Table 78. 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	Yes

Operating systems supported by Resource Monitors

This topic provides information about the operating systems supported by the Resource Monitors task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 79. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 80. 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	Yes

Table 81. 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	Yes

Operating systems supported by ServeRAID Manager

This topic provides information about the operating systems supported by the ServeRAID 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 systems must be xSeries and Netfinity servers.

Table 82. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 2
Editions of Windows for 32-bit systems:	
• Windows 2000, Advanced Server and Server Editions • Windows Server 2003 Standard Edition • Windows Server 2003 Enterprise Edition	Yes
• Windows 2000 Professional Edition • Windows 2000 Datacenter Edition • Windows XP Professional Edition • Windows Server 2003 Web Edition • Windows Server 2003 Datacenter Edition	No
Editions of Windows for 64-bit systems:	
• Windows Server 2003 Standard x64 Edition • Windows Server 2003 Enterprise x64 Edition	Yes
• Windows XP Professional x64 Edition • Windows Server 2003 Web x64 Edition • Windows Server 2003 Datacenter 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	Yes

Table 82. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 2
• VMware GSX Server, versions 3.1 and 3.2, Console • VMware GSX Server, versions 3.1 and 3.2, guest operating systems	No
Versions of Linux for 64-bit systems:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • SUSE LINUX Enterprise Server 9 for Itanium Processor Family	No
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	No
NetWare, version 6.5	Yes

Table 83. 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 84. 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

Operating systems supported by SNMP Browser

This topic provides information about the operating systems supported by the SNMP Browser task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

To use the SNMP Browser task, the operating system SNMP agent must be installed.

Table 85. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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	Yes
Other operating systems supported by xSeries servers:	
Microsoft Virtual Server (guest operating system)	Yes
NetWare, version 6.5	Yes

Table 86. 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	Yes

Table 87. 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	Yes

Operating systems supported by the Software Distribution (Standard Edition)

This topic provides information about the operating systems and the IBM Director managed-system levels supported by Software Distribution (Standard Edition).

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-0, Level-1, and Level-2 managed systems.

Notes:

1. Only packages in the Solution Install format can be distributed to Level-0 and Level-1 managed systems.
2. UpdateXpress packages can be distributed to Level-2 managed systems only.

Table 88. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 0	Level 1	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	Yes	Yes
Editions of Windows for 64-bit systems:			

Table 88. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 0	Level 1	Level 2
• 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	Yes	Yes	Yes
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	Yes	Yes
Versions of Linux for 64-bit systems:			
• 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	Yes	Yes	Yes
Other operating systems supported by xSeries servers:			
Microsoft Virtual Server (guest operating system)	Yes	Yes	Yes
NetWare, version 6.5	No	No	No

Table 89. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 0	Level 1	Level 2
i5/OS, Version 5 Release 3	No	No	No
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • 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	Yes	Yes	Yes

Table 90. Operating systems supported by System z9 and zSeries servers

Operating system	Level 0	Level 1	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	Yes	Yes	Yes

Operating systems supported by the Software Distribution (Premium Edition)

This topic provides information about the operating systems and the IBM Director managed-system levels supported by Software Distribution (Premium Edition).

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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-0, Level-1, and Level-2 managed systems only.

Notes:

1. Only packages in the Solution Install format can be distributed to Level-0 and Level-1 managed systems.
2. UpdateXpress packages can be distributed to Level-2 managed systems only.

Table 91. Operating systems supported by xSeries servers and third-party Intel-based systems

Operating system	Level 0	Level 1	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	Yes	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	Yes	Yes	Yes
Versions of Linux for 32-bit systems:			

Table 91. Operating systems supported by xSeries servers and third-party Intel-based systems (continued)

Operating system	Level 0	Level 1	Level 2
• 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	Yes	Yes
Versions of Linux for 64-bit systems:			
• 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	Yes	Yes	Yes
Other operating systems supported by xSeries servers:			
Microsoft Virtual Server (guest operating system)	Yes	Yes	Yes
NetWare, version 6.5	No	No	No

Table 92. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 0	Level 1	Level 2
i5/OS, Version 5 Release 3	No	No	No
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • 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	Yes	Yes	Yes

Table 93. Operating systems supported by System z9 and zSeries servers

Operating system	Level 0	Level 1	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	Yes	Yes	Yes

Operating systems supported by System Accounts

This topic provides information about the operating systems supported by the System Accounts task.

Management-server support

This task is supported on all operating systems supported by IBM Director Server.

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.

Table 94. Operating systems supported by xSeries servers and third-party Intel-based systems

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	Yes
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:	
• 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 • SUSE LINUX Enterprise Server 8 for AMD64 • SUSE LINUX Enterprise Server 9 for AMD64 and EM64T	Yes
• 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 Itanium Processor Family • 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	No

Table 95. Operating systems supported by iSeries servers and System p5 and pSeries servers

Operating system	Level 2
i5/OS, Version 5 Release 3	Yes
• AIX 5L, Version 5.2 • AIX 5L, Version 5.3 • 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 96. 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	Yes

Operating systems supported by System Availability

This topic provides information about the operating systems supported by the System Availability 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 97. 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:	

Table 97. Operating systems supported by xSeries servers (continued)

Operating system	Level 2
• 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:	
• 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	No

Table 98. 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 99. 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

IBM Director task support for BladeCenter products

This topic discusses IBM Director task support for BladeCenter products and how it varies depending on whether it is for the BladeCenter chassis, network devices, and blade servers.

A BladeCenter unit consists of a chassis, one or two management modules, one or more network devices (previously called switches, up to a total of four), and one or more blade servers (up to a total of 14, depending on the model).

The chassis is the physical enclosure that contains the blade servers. The chassis has one or two management modules that contain a service processor. IBM Director discovers the chassis and gathers information from the chassis by way of the management module. You cannot install IBM Director Agent or IBM Director Core Services on the chassis.

The network device is an SNMP device, and IBM Director considers the network device to be a managed device. When you view the network device in IBM Director, it might be displayed in the RMON devices group, which is a subgroup of the SNMP devices group.

IBM Director can gather some information from a blade server *before* IBM Director Agent or IBM Director Core Services is installed on the blade server. The information is gathered from the blade server by way of the chassis management module. In IBM Director Console, the blade server is represented by a physical platform managed object. However, after you install IBM Director Agent or IBM Director Core Services on the blade server, it is a managed object, and the features and functions that you can use on the blade server are comparable to those that you can use on any managed object.

IBM Director tasks that you can use on your BladeCenter unit can vary, depending on the features and options that you have installed. See the following table for a list of IBM Director tasks and information about whether you can use a task on the chassis, network device, or a blade server without IBM Director Agent or IBM Director Core Services installed. Unless otherwise noted in this documentation, a task behaves the same for blade servers as for any managed system.

Note: When IBM Director Agent or IBM Director Core Services is installed on a blade server, the supported tasks depend on the operating system that is installed on the blade server.

Table 100. IBM Director task support for BladeCenter products

Tasks and subtasks	Chassis	Network device	Blade server without IBM Director Agent or IBM Director Core Services installed
BladeCenter Configuration Manager	Yes	No	Not applicable
Event Action Plans	Yes	Yes	Yes
Hardware Status	Yes	No	Yes [1]
Inventory	Yes	Yes	Yes
Network Device Manager (formerly Switch Management launch pad)	Not applicable	Yes	Not applicable
Power Management	No	No	Yes
Rack Manager	Yes	Yes	No
Remote Session	Not applicable	Yes	No
Remote Monitors	No	Yes	No
SNMP Browser	No	Yes	Yes [2]

1. Inventory of the chassis, network device, and blade servers can be obtained through the management module. Blade server inventory that is collected through the management module is a subset of the total inventory that is available if IBM Director Agent or IBM Director Core Services is installed on the blade server.
2. To use the SNMP Browser task, the operating-system SNMP agent must be installed on the blade server.

Supported database applications

This topic provides information about the database applications that are supported for use with IBM Director. IBM Director Server uses an SQL database to store inventory data for the systems in the environment.

The following tables list the database applications supported by IBM Director Server. They also provide information about whether the database application can be installed locally (on the management server) or remotely.

Table 101. Database applications for management servers running AIX

Database application	Type of installation
Apache Derby (embedded in IBM Director Server)	Local only
IBM DB2 Universal Database™ 8.1with Fix Pack 9a	Local or remote
Oracle Server, versions 9.2 and 10g	Local or remote

Table 102. Database applications for management servers running i5/OS

Database application	Type of installation
IBM DB2 Universal Database for iSeries (part of i5/OS)	Local only

Table 103. Database applications for management servers running Linux (xSeries, System p5 and pSeries, and System z9 and zSeries)

Database application	Type of installation
Apache Derby (embedded in IBM Director Server)	Local only
IBM DB2 Universal Database 8.1with Fix Pack 9a	Local or remote
Microsoft SQL Server 2000 with Service Pack 3a	Remote only
Oracle Server, versions 9.2 and 10g	Local or remote
PostgreSQL, versions 7.2., 7.3, and 7.4	Local or remote

Table 104. Database applications for management servers running Windows

Database application	Type of installation
Apache Derby (embedded in IBM Director Server)	Local only
IBM DB2 Universal Database 8.1, Fix Pack 9a	Local or remote
Microsoft Data Engine (MSDE) 2000 (aka Microsoft SQL Server 2000 Desktop Engine) with Service Pack 3a (local use only)	Local only
Microsoft SQL Server 2000 with Service Pack 3a	Local or remote
Oracle Server, versions 9.2 and 10g	Local or remote

The Microsoft Jet database supported in previous releases of IBM Director continues to be supported only for IBM Director upgrades. MS Jet is *not* available as a database option for new installations.

Reviewing the environment

This topic describes how to review your environment before you install IBM Director.

Your network must be up and running before you install IBM Director. Complete the following tasks to facilitate the IBM Director installation and discovery of systems and devices:

- Determine the physical locations and network addresses of all systems and devices in your network. Identify local and remote subnets and the network protocols that are used.
- Determine the amount of traffic that your network can manage. If you have a wide area network (WAN) link, use a T1 line that transmits at a speed of *at least* a 1.5 megabytes per second (MBps) to ensure reliable network performance.
- Ensure that all systems and devices are correctly installed and cabled.
- Enable SNMP traps, if necessary. If you want IBM Director to poll SNMP devices and receive their alerts, make sure that an SNMP server and an SNMP trap service are running on the management server.

Identifying the hardware

This topic provides information about identifying the hardware in the environment that you want to manage with IBM Director.

The type of hardware in the environment might determine how you prepare the physical infrastructure or which features you select when you install IBM Director Server.

Begin the planning process by identifying the hardware that you want to manage with IBM Director and recording the information in the environment worksheet. Your environment might include one or more of the following types of hardware:

- Desktop and mobile computers
- @server BladeCenter units
- iSeries servers
- System p5 and pSeries servers
- xSeries servers
- System z9 and zSeries servers

If your environment includes xSeries servers, identify whether the servers include ServeRAID controllers or service processors.

Identifying local and remote subnets

This topic provides information about identifying local and remote subnets.

Identify the local and remote subnets in which the systems that you want to manage with IBM Director are located. Record this information in the "Worksheet: Environment" on page 341. You will need this information to configure the discovery preferences.

Identifying firewalls and blocked ports

This topic provides information about identifying firewalls and blocked ports.

Before installing IBM Director, you need to review the firewalls and blocked ports in your installation environment.

Consider each of the following issues carefully when planning to install IBM Director:

- The SLP port (port 427) needs to be open if the installation environment is behind a firewall.
- For the **getfru** command to run successfully, the managed system must have firewall access through a standard FTP port.
- The Remote Control and Software Distribution tasks both use session support to increase data transmission. Session support within TCP/IP causes data to flow through a nonreserved port that is different from the one that IBM Director typically uses for communication. Most firewalls do not allow the data to be transmitted through this other port.
- Windows firewall can interfere with discovery of managed systems running Windows XP.

Preparing the physical environment

Planning to manage a BladeCenter

This topic provides planning information for deploying IBM Director to manage the blade servers in an @server BladeCenter chassis.

Planning to manage a BladeCenter chassis using IBM Director Server on a non-blade server

This topic discusses planning considerations for using IBM Director Server on a non-blade server to manage servers in an @server BladeCenter chassis, and provides information about configuring the network for this installation.

You can install IBM Director Server on a non-blade server. With this management server you can manage one or more BladeCenter units and the blade servers installed in them.

1. Consider using a Dynamic Host Configuration Protocol (DHCP) server to assign an address to the external port of the management module. When a BladeCenter management module is first started, it searches for a DHCP server. If a DHCP server is not found, the BladeCenter management module assigns IP address 192.168.70.125 to the external management port. Because this static IP address is the same for all management modules, IP address conflicts can occur if you do not use a DHCP server and introduce multiple BladeCenter chassis onto a network simultaneously. When you configure the BladeCenter chassis, you assign static IP addresses to the switch module and the external and internal ports of the management module.
2. Set up a separate management network to configure and manage your BladeCenter chassis and blade servers. By separating the LAN segment used for production from the LAN segment to which the BladeCenter management module is connected, you can ensure that only authorized system administrators can connect to the BladeCenter chassis and switch modules. Figure 10 on page 140 shows such a network configuration.
3. If you intend to use Remote Deployment Manager (RDM), install RDM on the management server.
4. If you plan to use a database application other than Apache Derby, consider installing the database server on the management LAN.
5. Make sure that you have installed the latest version of the management module firmware. To download the firmware, go to the IBM Servers Web site at www.ibm.com/servers/.

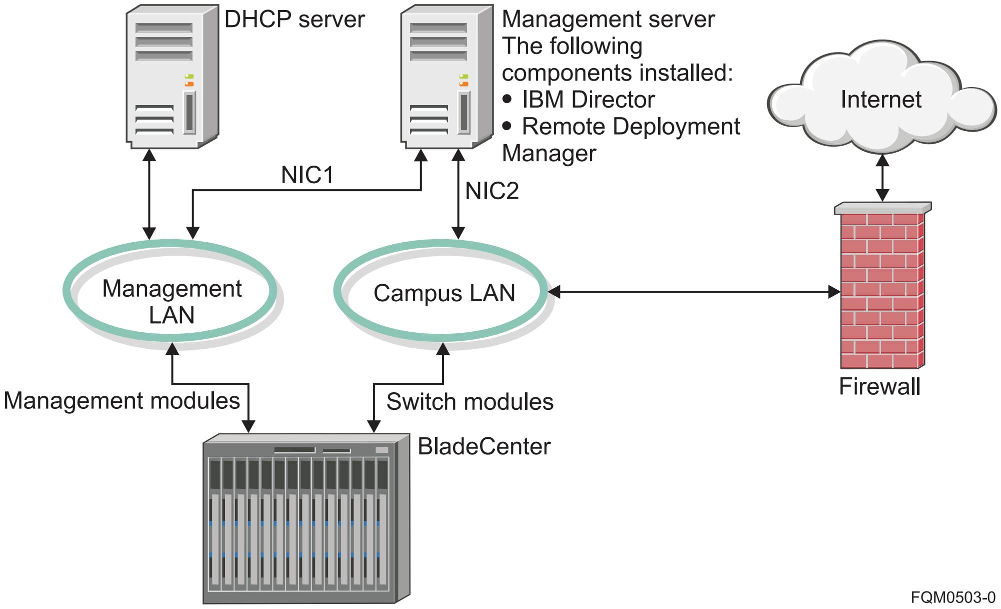


Figure 10. Example of BladeCenter deployment network when IBM Director Server is not installed on a blade server

This network configuration ensures that applications running on the blade servers cannot modify chassis settings, because the blade servers have no connection to either the management module or the switch module configuration ports.

Note: Only one of the following software applications can communicate with a BladeCenter management module at any given time:

- Cluster Systems Management (CSM)
- IBM Director Server
- IBM Management Processor Command-Line Interface (MPCLI)

Planning to manage a BladeCenter chassis using IBM Director Server on a blade server

This topic discusses planning considerations for installing IBM Director Server on a blade server, and provides information about configuring the network to allow this installation.

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.

Consider the following issues 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.

By default, the blade servers installed in a BladeCenter chassis cannot communicate automatically with the BladeCenter 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.

1. Consider using a Dynamic Host Configuration Protocol (DHCP) server to assign an address to the external port of the management module. When a BladeCenter management module is first started, it searches for a DHCP server. If a DHCP server is not found, the BladeCenter management module assigns IP address 192.168.70.125 to the external management port. Because this static IP address is the same for all management modules, IP address conflicts can occur if you do not use a DHCP server and introduce multiple BladeCenter chassis onto a network simultaneously. When you configure the BladeCenter chassis, you assign static IP addresses to the switch module and the external and internal ports of the management module.
2. Set up a separate management network to configure and manage your BladeCenter chassis and blade servers. By separating the LAN segment used for production from the LAN segment to which the BladeCenter management module is connected, you can ensure that only authorized system administrators can connect to the BladeCenter chassis and switch modules. Figure 10 on page 140 shows such a network configuration.
3. To use an installation of IBM Director Server on a blade to manage the BladeCenter unit in which the management server is installed, enable communication between the Campus LAN and the Management LAN. Figure 11 on page 142 shows such a network configuration.
4. If you intend to use Remote Deployment Manager (RDM), install RDM on the management server.
5. If you plan to use a database application other than Apache Derby, consider installing the database server on the management LAN.
6. Make sure that you have installed the latest version of the management module firmware. To download the firmware, go to the IBM Servers Web site at www.ibm.com/servers/.

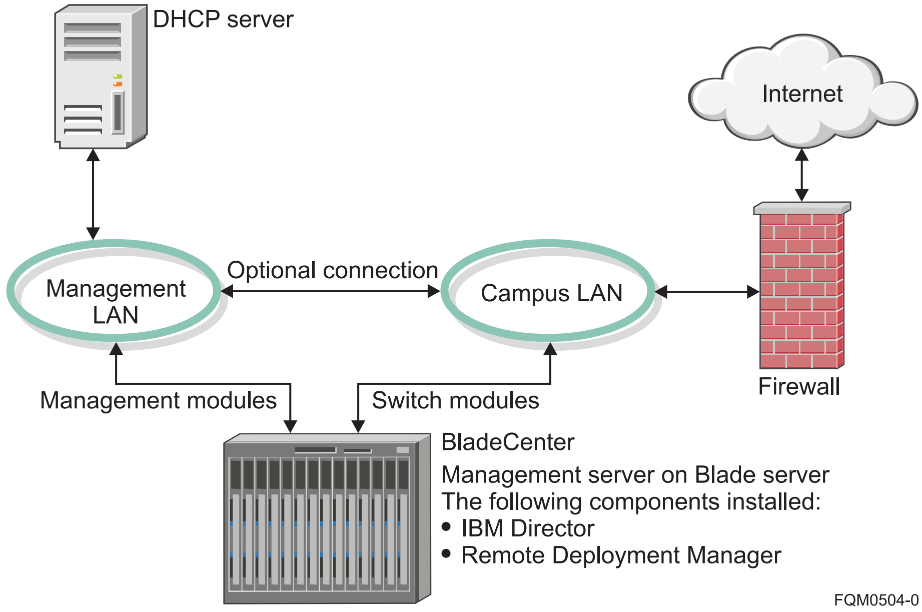


Figure 11. Example of BladeCenter deployment network when IBM Director Server is installed on a blade server

With this configuration, IBM Director Server can communicate through the Campus LAN to the Management LAN and then onto the management module.

Note: Only one of the following software applications can communicate with a BladeCenter management module at any given time:

- Cluster Systems Management (CSM)
- IBM Director Server
- IBM Management Processor Command-Line Interface (MPCLI)

Planning to install IBM Director

This topic provides planning information that will ensure that the installation of IBM Director is completed successfully.

Choosing where to install IBM Director Server

This topic describes how to choose a server on which to install IBM Director Server.

Determine the server on which you will install IBM Director Server. You might want to install more than one instance of IBM Director Server, depending on the following considerations:

- Consider whether you will be installing components of the Virtualization Engine management collection. This has a few potential impacts on the IBM Director installation:
  1. Review and consider the installation requirements for the Virtualization Engine components you will install. Some of these requirements can affect your installation of IBM Director Server.
  2. Ensure that the management server where IBM Director Server will be installed is available to the server on which Virtualization Engine components will be installed, and that the management server has the required ports available.

3. Install IBM Director Server before installing Virtualization Engine components. This allows IBM Director to be registered in the Virtualization Engine environment when the management collection components are installed.

Refer to the Virtualization Engine documentation for more information.

- Consider installing IBM Director Server on a blade to manage a BladeCenter chassis. @server BladeCenter chassis may be managed using IBM Director Server installed either on a blade in the BladeCenter, or on a separate management server. Refer to “Planning to manage a BladeCenter” on page 139 for detailed information.
- For Windows installations, do not install IBM Director Server on a domain controller, due to the following possible consequences:
  - Its high resource usage might degrade domain controller performance.
  - If you install IBM Director Server on a domain controller and then demote the domain controller, you no longer can access IBM Director Console.
  - Unless the IBM Director service account has domain administrator privileges, you cannot restart IBM Director Server.
- Consider installing multiple instances of IBM Director Server. Installing IBM Director Server on multiple management servers may be helpful in the following situations:
  - You want to manage more than 5000 systems.
  - The systems that you want to manage are in several geographic locations or are owned by multiple system administrators.
  - You want to manage each BladeCenter with an installation of IBM Director Server on a blade in the chassis.
- Consider the kind of database you wish to use. You may wish to use a particular database for IBM Director data, to facilitate data-mining activity or for other reasons. Not all databases are supported for all IBM Director Server installation locations. Refer to “Selecting the IBM Director database application” on page 145 for detailed information.
- Consider the extensions you wish to install, and their requirements. Some extensions, such as Capacity Manager, can require large amounts of storage. Select a management server—or multiple management servers—which will allow extensions to be installed and continue functioning even if the network grows.

Selecting the IBM Director Server installation options

This topic describes how to determine the options that you can select when you install IBM Director Server. These options include features, encryption settings, network settings, and file locations.

When you install IBM Director Server, you must make various choices. Use the “Worksheet: Installing IBM Director Server” on page 346 to record the decisions that you make as you work through this procedure. Complete the following steps:

1. Determine the optional features that you want to install. You can choose from the following features:

   IBM Director Remote Control Agent

   Select this feature if you want to use the Remote Control task to remotely control the management server.

   BladeCenter Management

   Select this feature if your environment includes BladeCenter units.

Rack Manager
Select this feature if you want to use the Rack Manager task. You can use the Rack Manager task to build a realistic, visual representation of a rack and its components.

2. Determine the location where you want to install IBM Director Server. By default, IBM Director Server is installed in the following locations:

Operating System	Location
i5/OS	`/qibm/proddata/director`
Linux or AIX	`/opt/ibm/director`
Windows	*`d`*`:\Program Files\IBM\Director`

d is the drive letter of the hard disk drive.

3. Determine the IBM Director service account information. You need to provide the following information when you install IBM Director Server:
   - Computer name
   - User name
   - Password
4. Determine whether you want to encrypt the data that is transmitted between IBM Director Server and IBM Director Agent. If you want to encrypt the data transmissions, you can select from the following encryption settings.

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.

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

Triple Data Encryption Setting (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.

5. Determine where software-distribution packages are located. By default, software-distribution packages are located in the following directories:

Operating System	Location
i5/OS	`/qibm/proddata/director/`*`directory`*
Linux or AIX	`/opt/ibm/director/`*`directory`*
Windows	*`d`*`:\Program Files\IBM\Director\`*`directory`*

`directory` is one of the following strings:
- SwDistPk
- SwPkInst

IBM Director Server creates software-distribution packages in the SwDistPk directory; when software packages are distributed to the instance of IBM Director Agent running on the management server, these packages are placed in the SwPkInst directory.

6. Determine the network settings:

a. Will you enable all or only certain network interface cards (NICs)? If you enable an individual NIC, IBM Director Server will receive only those data packets that are addressed to the individual adapter.
b. Determine the network timeout setting, which is the number of seconds that IBM Director Server waits for a response from IBM Director Agent. By default, the network timeout setting is 15 seconds.
c. Determine whether you want to enable Wake on LAN.

7. (If IBM Director Remote Control Agent is installed) Determine which remote control options you want to enable:
   - Require user authorization for system access
   - Disable screen saver
   - Disable background wallpaper

Planning for Capacity Manager

This topic provides planning steps for installing the Capacity Manager extension for IBM Director.

The principal concern when planning to install Capacity Manager is the amount of disk space required for Capacity Manager data and reports. For a network with 1000 managed systems, Capacity Manager may require about 4GB of disk space.

1. Estimate the disk space required for Capacity Manager data. Capacity Manager data is stored internally, irrespective of the installed database for IBM Director. Use the worksheet "Worksheet: Capacity Manager space requirements" on page 342 to estimate the disk space which will be required for Capacity Manager data and reports.
2. If the disk space required for Capacity Manager data will be prohibitive, consider the following options:
   - Reduce the frequency of data collection.
   - Reduce the number of days' data that Capacity Manager will retain.
   - Reduce the frequency of report generation.
   - Plan to archive Capacity Manager data and reports to a system with additional storage.

   Use the Capacity Manager space requirements worksheet to re-calculate the storage requirements with different parameters.

Selecting the IBM Director database application

The topic describes how to select the database application to use with IBM Director Server.

IBM Director Server uses the database to store inventory information in a central point. This inventory information then can be used for managing your assets.

Before you install IBM Director Server, you should decide which database you want to use. Some installations will not require a database installed.

The Apache Derby database is embedded in IBM Director Server and is the default database on all platforms except for i5/OS. The default database for i5/OS is IBM DB2®.

Use the following steps to determine the appropriate database application for your installation of IBM Director.

Use Table 105 to determine what database(s) meet your needs. The criteria are described following the table.

Table 105. Database selection criteria for IBM Director 5.10

Criterion	No database	Apache Derby	IBM DB2	Microsoft Data Engine (MSDE) 2000	Microsoft SQL Server 2000 Desktop Engine	Microsoft SQL Server 2000	Oracle Server	PostgreSQL
Using inventory functionality	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Using dynamic groups	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accessing data with a third-party tool while IBM Director is running	No	No	Yes	No	Yes	Yes	Yes	Yes
Large managed network (> ~500 managed objects)	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Using Capacity Manager	No	Yes[4]	Yes	Yes[4]	Yes	Yes	Yes	Yes
IBM Director Server on AIX	n/a	Local (default)	Local or remote	No	No	No	Local or remote	No
IBM Director Server on i5/OS	n/a	No	Local (default)	No	No	No	No	No
IBM Director Server on Linux	n/a	Local (default)	Local or remote	No	No	Remote	Local or remote	Local or remote
IBM Director Server on Windows	n/a	Local (default)	Local or remote	Local	Local	Local or remote	Local or remote	No

The criteria from Table 105 are described more fully below:

Using inventory functionality

If you will be performing inventory tasks in IBM Director, a database of some kind is required to store the inventory information.

Using dynamic groups

If you will be using dynamic groups in IBM Director, a database of some kind is required to store the information.

Accessing data with a third-party tool while IBM Director is running

Database mining by other applications may or may not be useful in your environment. If you will need to access IBM Director data such as inventory or group information while IBM Director is running, you cannot use Apache Derby. Instead, DB2, Oracle, or SQL Server are good choices.

[4] Support may be limited for larger networks. For more information, refer to “Planning for Capacity Manager” on page 145.

Large managed network (> ~500 managed objects)
If you will be managing a large network (approximately 500 managed objects or more), Apache Derby is probably not sufficient to meet your database needs.

local The database is installed on the management server along with IBM Director Server. A local database server offers better ease of use, and connectivity and security are simpler. Additionally, you have no dependencies (for example, you would not have to contact the database department to change the database settings), and a separate server is not required for housing the database. On the other hand, you must plan backup carefully, as you would have a single point of failure with the database and application server residing on the same machine.

remote
The database is installed on a different server than the management server, and accessed remotely by IBM Director Server. Remote databases have several advantages, including reduced memory requirements for the management server and the possibility of not having to purchase a database license if you already have one on a corporate server.

Planning for tiered deployment of IBM Director

IBM Director's tiered architecture requires system administrators to decide how to deploy IBM Director components to manage objects.

Depending on the type of managed object and the management tasks you wish to perform, IBM Director may be deployed to manage objects in one of three tiers:

Level 0
No IBM Director components installed; limited function. Level-0 managed systems can be IBM or non-IBM servers, desktop computers, workstations, and mobile computers supporting either the Secure Shell (SSH) or Distributed Component Object Model (DCOM) protocol and running either Windows or Linux. Level-0 managed objects may also include managed objects supporting SSH or SNMP, such as Remote Supervisor Adapter (RSA) or SNMP devices.

Level 1
IBM Director Core Services installed; more function than Level 0. Level-1 managed systems can be IBM servers, desktop computers, workstations, and mobile computers running either Windows or Linux.

Level 2
IBM Director Agent installed; full management of object. Level-2 managed systems can be IBM servers, desktop computers, workstations, and mobile computers running one of the following operating systems:

- AIX
- i5/OS
- Linux (xSeries, System p5 and pSeries, and System z9 and zSeries)
- NetWare
- Windows

For each managed object or managed object type, decide what level of management is required for the objects.

Planning for events

An *event* is an occurrence of a predefined condition relating to a specific managed object. There are two types of events: alert and resolution. An *alert* is the occurrence of a problem relating to a managed object. A *resolution* is the occurrence of a correction or solution to a problem relating to a managed object.

Note: In the IBM Director product, there are tasks and features that use the word *alert* in place of the word *event*. Also, some tasks use the word *notification* instead of event.

Sources that can generate events include, but are not limited to, the following programs and protocols:

- IBM Director Agent
- IBM Director Core Services
- Microsoft Windows event log
- Windows Management Instrumentation (WMI)
- SNMP through out-of-band communication
- Alert Standard Format (ASF) Platform Event Traps (PET) through out-of-band communication
- Intelligent Platform Management Interface (IPMI) Platform Event Traps (PET) through out-of-band communication
- IBM service processors through out-of-band communication

To monitor one or more events, you must create an event filter that contains an event type from one of these sources, use the event filter as part of an event action plan, and then apply the event action plan to a managed object. Events from the Windows event log are displayed in the Windows event log tree in the Event Type Filter Builder. Events from WMI are displayed in the Common Information Model (CIM) tree.

Successful use of event notification depends on careful planning. The following questions should be considered:

1. Which events can be monitored on the managed object?
   a. Which of these events are useful to my management strategy?
   b. What configuration is required for the managed object to send event notifications?
2. How should event notifications be sent to IBM Director?

See the *IBM Director Events Reference* for additional information.

Planning events to be monitored

The events that you can monitor are divided into three groups. You can enable the monitoring of these events using any one of the available user interfaces, including IBM Director and a Web browser.

Tip: These events are not enabled by default.

- Critical alerts
  – Temperature outside critical thresholds
  – Voltage outside critical thresholds
  – Tamper alert (server cover opened) - on some servers only

  - Multiple fans failure
  - Power supply failure
  - Hard disk drive failure
  - VRM failure
- Warning alerts (non-critical)
  - Redundant power supply failure
  - Single fan failure
  - Temperature outside warning thresholds
  - Voltage outside warning thresholds
- System alerts
  - Operating system timeout value is exceeded
  - Power off
  - Power on
  - Boot failure
  - Server loader timeout value is exceeded
  - PFA notification
  - Partition configuration

If you enable the O/S timeout and server loader timeout alerts, then you also must plan to enable those timeouts.

1. Consider how events will be sent by the managed systems to IBM Director Server. There are generally two options:
   - via telephonic modem
   - over a LAN, using an IP address
2. On the service processors that have Ethernet connections and modems, you should configure those connections so alerts can be sent through them. For Ethernet connections, configure either a static IP address or enable the use of DHCP.

   Tips:

   - The RSA and RSA II support DHCP; however, the use of a static IP address is potentially more reliable than using DHCP. A static address will mean that the failure or inaccessibility of DNS and/or DHCP servers will not prevent access to the service processor.
   - If the RSA II is set to use DHCP but does not receive an address from the DHCP server within two minutes, it will set its address as 192.168.70.125.
   - For modem use, configure the standard modem settings (baud rate, parity, and stop bits) plus any additional strings if necessary.
   - For SNMP, enable traps and the SNMP agent, and configure the community name and IP address.
   - For SMTP, configure the SMTP server.

Planning for event action plan implementations

To plan and design an event action plan, you must determine what the goal of the event action plan is. Consider which managed objects you intend to target with the event action plan. You can target all managed objects, a subgroup of managed objects, or a specific managed object.

You can structure event filters and event actions in different ways. This section presents some of the possible structures that you can use. Remember that many event action plans might include each of the elements of each of the structures that are presented.

When designing your event action plan structure, consider all the managed objects in groups. Start by designing an event action plan that contains events that apply to the largest number of objects. Then, create event action plans that cover the next largest group of managed objects, and continue to group them until you reach the individual managed-object level. When doing this, remember that each managed object can be a member of multiple groups.

When planning an event action plan structure, consider the following issues:

- What do you want to monitor on most or all of the managed objects of the same type as a whole? This answer determines the grouping and event filters for your event action plans.
- How will you group your managed objects as smaller groups, according to the additional events you want to monitor? The smaller groups are usually based on the following criteria:
  - Managed-object manufacturer, for vendor-specific events
  - Function of the managed object, for services and resources specific to that function
- What type of managed objects are you monitoring?
- What is the function of the managed object?
- What are the key monitors for the managed object?
- Are there other managed objects for which you want to use the same monitors?

Managing and monitoring systems with event action plans:

This topic provides information about events and event action plans; how to plan, design, and build event action plan implementations; and how to work with existing event action plans.

You can use event action plans to specify actions that occur as a result of events that are generated by a managed object. An event action plan is composed of two types of components:

- One or more event filters, which specify event types and any related parameters
- One or more event actions, which occur in response to filtered events

You can apply an event action plan to an individual managed object, several managed objects, or a group of managed objects.

By creating event action plans and applying them to specific managed objects, you can be notified by e-mail or pager, for example, when a specified threshold is reached or a specified event occurs. You also can configure an event action plan to start a program on a managed object and change a managed-object variable when a specific event occurs. You can use process-monitor events and resource-monitor events to build an event action plan.

Successful implementation of event action plans requires planning and consideration of how you will implement them. In particular, developing and following strict naming conventions is important, so that you can easily identify what a specific plan does.

Note: When you first start IBM Director, the Event Action Plan wizard starts. You can use this wizard to create an event action plan.

Planning managed object grouping:

Event action plans are best implemented by grouping all of your managed objects into both larger and smaller groups. The following criteria are examples of groupings:

Type of managed object (servers, desktop computers, workstations, mobile computers, and network equipment)
Each type of managed object has its own event action plans.

By manufacturer
Each managed-object manufacturer has its own event action plans. Many organizations have managed objects from multiple manufacturers. In this case, if manufacturer-specific event monitors are required, you might want to have manufacturer-specific event action plans for each type of managed object.

By function
Each function of the managed object has its own event action plans. Each group of managed objects performing specific roles has different events to monitor. For example, on all of your print servers, you might want to monitor the print spoolers and printers.

By resources
Event action plans are based on specific resources. Typically, these event action plans monitor a specific resource outside of those in the managed-object type of event action plan. These resource event action plans might apply to managed objects with more than one system function but not to all managed objects of the same type.

By management technology
If you have many devices that send SNMP traps, you can design event action plans to act on those events.

Structuring event action plans:

Determine the overall structure of your event action plans before you create them. A little planning in advance can prevent wasted time and duplication of effort. Consider the following examples of event action plan structures:

A structure based on the areas of responsibility of each administrator
Servers are maintained and managed by one group of personnel, and desktop computers and mobile computers are maintained by another group of personnel.

A structure based on administrator expertise
Some organizations have personnel that specialize in particular types of technology. These individuals might be responsible for complete managed objects or only certain software running on these managed objects.

A structure based on managed-object function
Servers performing different functions are managed differently.

A structure based on the type of event
Examples of some structures based on the type of event are monitoring a specific process and monitoring for hardware events.

A structure based on workday shifts

Because you can set up the event filters to be active during certain parts of certain days, you can structure your event action plans and event filters according to the shift that will be affected by the events that are occurring.

Structuring event filters:

You can use an event filter to capture a single event or multiple events. The following list includes some of the criteria that you can use to determine whether to include an event with other events:

- All managed objects that are targeted for the filter are able to generate all events that are included in the filter. If the managed object does not generate the event for which the filter is defined, the filter will not be effective on that managed object.
- The event actions that will be used to respond to the event are the same for all targeted objects.
- The other event filter options besides the event type are common for all targeted objects. These settings include the times the event filter is active, the severity of the event, and other attributes.

Event action plans can include event filters with event types that are not generated by all managed objects. In such instances, you can apply the event action plan to those managed objects, but it will have no effect. For example, if an event filter is based on a ServeRAID event and that event action plan is applied to managed objects that do not have a ServeRAID adapter installed, the event filter has no events to filter, and therefore, no actions are performed. If you understand this concept, you can create more complex event action plans, and you can reduce the number of event action plans you have to build and maintain.

All currently available event types are displayed in the tree on the Event Type page in the Event Filter Builder window. The currently installed tasks and extensions publish their events in the Event Type tree when IBM Director Server or IBM Director Agent starts.

Note: Whether the events are published when IBM Director Server or IBM Director Agent starts depends on the tasks or extensions and how they are implemented.

If you add an extension to your IBM Director installation, the extension might publish its events either when it is added to the installation or when the extension sends its first event. If the extension publishes when it sends its first event, *only* that event is published.

Chapter 3. Installing

This section provides instructions for installing IBM Director Server, IBM Director Console, IBM Director Core Services, IBM Director Agent, and IBM Director extensions. In addition, it contains information about how to prepare your environment for the installation of IBM Director, instructions for upgrading IBM Director from previous releases, and recommendations for the initial configuration of IBM Director.

Preparing to install IBM Director

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

Preparing the IBM Director database

This topic describes how to prepare the SQL database that IBM Director uses to store inventory data.

Unless you plan to use Apache Derby or IBM DB2 Universal Database for iSeries, you must prepare the database application before configuring IBM Director Server to use it. IBM Director can be installed before preparing the database, but you will not be able to use database-dependent features until you configure IBM Director Server to use a database.

The preparation required depends on the database application; it might include one or more of the following tasks:

- Downloading and installing the applicable Java Database Connectivity (JDBC) drivers
- Creating a database or server ID
- Configuring and starting a TCP/IP listener
- Setting the authentication mode

The database administrator should determine an appropriate size for the database file. If IBM Director will be managing 300 - 500 systems, an initial size of 100 MB is sufficient. A larger database might be necessary if there will be additional managed systems or extensive inventory data.

Preparing IBM DB2

This topic describes how to prepare an IBM DB2 database for use with IBM Director.

The IBM DB2 database can be installed on the management server. Except when IBM Director Server is installed on i5/OS, the IBM DB2 database can optionally be installed on a remote server from the management server. See Table 106 on page 154 for a detailed listing of IBM DB2 database installation options.

Table 106. IBM DB2 installation options

IBM Director Server installed on:	IBM DB2 database installed on:			
	Same server as IBM Director Server	AIX	Linux	Windows
AIX	local	remote	remote	remote
i5/OS	local	-	-	-
Linux	local	remote	remote	remote
Windows	local	remote	remote	remote

Complete the following tasks before installing IBM Director Server:

1. Install IBM DB2 Universal Database 8.1 with fix pack 9a, if you have not done so already.

   Note: The DB2 client installation is not required for IBM Director release 5.10.
2. Install the DB2 Java JDBC Type 4 Universal driver on the management server. This driver is located on the DB2 Run-time or Administration Client. Only the Java support selection is required. The installation must use the driver provided with Fix Pack 9a.
3. Create a user on the DB2 server for the IBM Director database.
4. Create the DB2 database, if it does not already exist. The DB2 database must be created on the local or remote server before you configure IBM Director to use it.
5. Grant the following runtime permissions for the user you created on the DB2 server:
   - CREATE TABLE
   - ALTER TABLE
   - DROP TABLE
   - CREATE INDEX
   - ALTER INDEX
   - DROP INDEX
   - CREATE VIEW
   - ALTER VIEW
   - DROP VIEW
6. If IBM Director Server will be installed on a Linux platform, perform the following steps on the Linux management server on which IBM Director Server will be installed:
   a. Create a `/etc/ibm/director/setup_env` file. Add the following statement to the file:
   ```
   . /home/db2inst1/sqllib/db2profile
   ```
   home/db2inst1 is the directory in which DB2 is installed. This statement sets up the DB2 environment.

   b. Set the `setup_env` file attributes to read-execute.
7. Provide the following information to the system administrator who will install IBM Director Server:
   - TCP/IP listener port ID
   - Host name of the database server
   - Database name
   - User ID and password

Note: The IBM DB2 Information center has current information about security in DB2.

Preparing Microsoft Data Engine and Microsoft SQL Server 2000

This topic describes how to prepare a Microsoft Data Engine (MSDE) 2000 or Microsoft SQL Server 2000 database for use with IBM Director.

Complete the following tasks before installing IBM Director Server:

1. **(Microsoft SQL Server 2000 only)** Install Microsoft SQL Server 2000 Service Pack 3a, enabling network connections and setting the security to mixed mode. The Java Database Connectivity (JDBC) driver provided by Microsoft does not support trusted connections; these settings enable the database to work with the SQL Server 2000 Driver for JDBC required by IBM Director.
2. **(MSDE 2000 only)** Install MSDE 2000 Service Pack 3a, using the following command-line parameters to override the default settings:

   ```
   DISABLE NETWORKPROTOCOLS=0
   SECURITYMODE=SQL
   ```

   If SP 3a is already installed: By default, Service Pack 3a is installed with network connections disabled and security set to Windows authentication. Ensure that network connections are enabled and that the authentication mode is set to mixed mode. For information about changing these parameters for an existing installation, see the following Microsoft Knowledge Base articles:

   - 285097 *How to Change the Default Login Authentication Mode to SQL*
   - 319930 *How to Connect to Microsoft Desktop Engine*
3. Install the SQL Server 2000 Driver for JDBC Service Pack 3. You can download this driver from www.microsoft.com/sql/downloads.
4. Set the system variable CLASSPATH to include the following entries:
   - *sql_server_directory*/lib/msbase.jar
   - *sql_server_directory*/lib/msutil.jar
   - *sql_server_directory*/lib/mssqlserver.jar

   Replace *sql_server_directory* with the fully qualified path of the directory in which the SQL Server 2000 Driver for JDBC is installed.

   Note: For Linux installations, use the `/etc/ibm/director/setup_env` file to set CLASSPATH.

   For example:

Windows	`CLASSPATH=.;`
	`c:\Microsoft SQL Server 2000 Driver for JDBC\lib\msbase.jar;`
	`c:\Microsoft SQL Server 2000 Driver for JDBC\lib\msutil.jar;`
	`c:\Microsoft SQL Server 2000 Driver for JDBC \lib\mssqlserver.jar`

UNIX	`CLASSPATH=/opt/msSQLjdbc/lib/msbase.jar:`
	`/opt/msSQLjdbc/lib/msutil.jar:`
	`/opt/msSQLjdbc/lib/mssqlserver.jar`

5. Create an SQL Server ID for use with IBM Director.

6. Complete one of the following tasks:

Option	Description
To create the database during the installation of IBM Director	Assign the SQL Server ID Create Database permission in the master database. When the database is created during the IBM Director installation, the size of the database is set to the larger of the following sizes: • The size of the model database • The default database size specified in the SQL Server configuration options
To create the database now	Create the SQL Server database and give the following runtime permissions to the SQL Server ID that you created in step 1 on page 155: • CREATE TABLE • ALTER TABLE • DROP TABLE • CREATE INDEX • ALTER INDEX • DROP INDEX • CREATE VIEW • ALTER VIEW • DROP VIEW

7. Provide the following information to the system administrator who will install IBM Director Server:
   - TCP/IP listener port ID
   - Host name of the database server
   - Database name
   - User ID and password

Preparing Oracle Server

This topic describes how to prepare an Oracle Server database for use with IBM Director.

Before preparing the Oracle Server database for use with IBM Director, ensure that the following conditions are met:

- Oracle Server must be installed.
- IBM Director is certified to run with the Oracle Java Database Connectivity (JDBC) thin driver for use with Java Development Kit (JDK) 1.4 *only*. One of the following Oracle Java Database Connectivity (JDBC) thin drivers must be installed:

For Oracle Server 9.2	Version 9.2.0.5
For Oracle Server 10g	Version 10.1.0.2.0

You can download the Oracle JDBC thin drivers from www.otn.oracle.com/software/content.html.

Complete the following tasks before installing IBM Director Server:

1. Make sure that the CLASSPATH statement points to the fully qualified name of the `ojdbc14.jar` file that contains the Oracle JDBC thin driver.
2. Create the Oracle Server database.

3. Configure and start the Oracle TCP/IP listener.
4. If IBM Director Server will be installed on a Linux platform, perform the following steps on the Linux management server on which IBM Director Server will be installed:
   a. Create a /etc/ibm/director/setup_env file. Add the following statements to the file:

      ```
      CLASSPATH=path/ojdbc14.jar
      export CLASSPATH
      ```

      path is the path of the ojdbc14.jar file that contains the Oracle JDBC driver.
   b. Set the setup_env file attributes to read-execute.
5. Provide the following information to the system administrator who will install IBM Director Server:
   - Oracle administrator account ID and password
   - Oracle system identifier (SID)
   - Oracle TCP/IP listener port ID
   - TCP/IP host name of the database server

   Note: The Oracle administrator account ID and password are used to perform the following tasks only:
   - Create table spaces and a role (TWG_ROLE)
   - Assign a user ID and password

   IBM Director *does not* save the Oracle administrator account ID and password.

Preparing PostgreSQL

This topic describes how to prepare a PostgreSQL database for use with IBM Director.

- PostgreSQL must be installed.
- The Java Database Connectivity (JDBC) driver must be compatible with JDK 1.4.
- The PostgreSQL postmaster must be running with the -i flag.

Complete the following tasks before installing IBM Director Server:

1. Create a PostgreSQL server ID for use with IBM Director.
2. Complete one of the following tasks:

Option	Description
To create the database during the installation of IBM Director	Assign the PostgreSQL server ID that you created in step 1 Create Database permission.

Option	Description
To create the database now	Create the PostgreSQL database and give the following runtime permissions to the PostgreSQL server ID that you created in step 1 on page 157: • CREATE TABLE • ALTER TABLE • DROP TABLE • CREATE INDEX • ALTER INDEX • DROP INDEX • CREATE VIEW • ALTER VIEW • DROP VIEW

3. If IBM Director Server will be installed on a Linux platform, perform the following steps on the Linux management server on which IBM Director Server will be installed:
   a. If the PostgreSQL JDBC driver is not named `postgresql.jar`, create a symbolic link for the driver. From a command prompt, type the following command and press **Enter**:

      ```
      ln -s realname path/postgresql.jar
      ```

      - *realname* is the fully qualified name of the PostgreSQL JDBC driver, for example, `/opt/postgres/lib/jdbc7.1-2.jar`.
      - *path* is the path of the symbolic link, for example, `/opt/postgres/lib/`.

   b. Create a `/etc/ibm/director/setup_env` file. Add the following statement to the file:

      ```
      export CLASSPATH=path/postgreslq.jar
      ```

      path is the path of the PostgreSQL JDBC driver, for example, `/opt/postgres/lib`.

      Note: If you created a symbolic link to the PostgreSQL JDBC driver, *path* is the path of the symbolic link.

   c. Set the `setup_env` file attributes to read-execute.
4. Provide the system administrator who will install IBM Director Server with the following information:
   - Database name (if the PostgreSQL database was created in step 2 on page 157)
   - Host name of the database server
   - PostgreSQL IP listener port
   - User ID and password, if necessary

Preparing to install IBM Director Server

This topic describes how to prepare your system for the installation of IBM Director Server.

Preparing to install IBM Director on an iSeries server

This topic provides information about preparing an iSeries server for the installation of IBM Director.

Before you install IBM Director on an iSeries server, consider the following information:

- IBM Director for i5/OS is installed using the IBM Virtualization Engine installation wizard. When you select to install IBM Director Server, the installation images for IBM Director Agent and IBM Director Console are also selected to by copied to the management server by default. After the installation of IBM Director Server is complete, you must install IBM Director Console on a desktop computer, workstation, or mobile computer to provide a GUI to access IBM Director Server.
- The iSeries server must be in an unrestricted state, and your user profile should have *ALLOBJ, *SECADM, *JOBCTL, and *IOSYSCFG special authorities.
- Ensure that the following products and options are installed on the iSeries (i5/OS V5R3) server where you plan to install IBM Director, along with the latest cumulative PTF packages or Group PTFs. They are required to successfully install and securely run IBM Director.

Table 107. iSeries servers: Required products and options

Products or options	Order number
IBM Cryptographic Access Provider 128-bit for iSeries	5722-AC3
IBM HTTP Server for iSeries	5722-DG1
Extended Base Directory Support, Option 3	5722-SS1
Java Developer Kit 1.4, Option 6	5722-JV1
OS/400® - Qshell, Option 30	5722-SS1
OS/400 - Digital Certificate Manager, Option 34	5722-SS1

- If you plan to use Software Distribution to distribute IBM Director Agent to Level-0 managed systems that are running i5/OS, ensure you have installed and configured Open SSH, provided in i5/OS Utilities, *BASE and Option 1 (order number 5733-SC1) on the managed systems. For more information about Open SSH, see www.openssh.org.
- If you plan to use IBM Director to monitor SNMP devices in your IBM eServer i5 or iSeries environment, ensure you have completed the necessary configuration tasks for iSeries and SNMP devices. See the Networking topic in the iSeries Information Center for more information.
- If you want to install IBM Director on an i5/OS logical partition that is running AIX, see “Preparing to install IBM Director on System p5 and pSeries servers”

Preparing to install IBM Director on System p5 and pSeries servers

This topic provides information about preparing a System p5 or pSeries server for the installation of IBM Director.

Before you install IBM Director on a System p5 or pSeries server, consider the following information:

- **(Red Hat Enterprise Linux AS, version 4.0, for IBM POWER only) All Components**

  Before installing IBM Director on a system running Red Hat Enterprise Linux AS, version 4.0, for IBM POWER, ensure that the following RPM file is installed:

  compat-libstdc++-33-3.2.3-47.3.ppc.rpm
- **(AIX only) IBM Director Server and Level 2: IBM Director Agent**

  Ensure that the following packages are installed:
  - openSSL RPM
  - sysmgt.pegasus.cimserver
  - sysmgt.pegasus.osbaseproviders

For more information about installation and requirements for OpenSSL and Pegasus, go to the pSeries and AIX Infocenter at publib.boulder.ibm.com/infocenter/pseries/index.jsp?topic=/com.ibm.aix.doc/aixbman/cim/ciminstall.htm.

- **(Linux on POWER only) IBM Director Core Services**

  Ensure that the following RPM files (or later versions) are installed:
  - librtas-1.2-1.ppc64.rpm
  - ppc64-utils-2.5-2.ppc64.rpm
  - lsvpd-0.12.7-1.ppc.rpm

  You can download these RPM files from the IBM Service and productivity tools for Linux on POWER Web site at techsupport.services.ibm.com/server/lopdiags. Select the appropriate tab for your Linux distribution.
- **(SUSE LINUX Enterprise Server 9 for IBM POWER only) Level 1: IBM Director Core Services**

  Disable the Service Location Protocol daemon (SLPD) before installing IBM Director Core Services. IBM Director Server does not discover Level-1 managed objects that are running SLPD.
- **IBM Director Console**
  - (AIX only) Ensure that the following packages are installed:
    - sysmgt.sguide
    - sysmgt.websm
  - (AIX only) Before installing IBM Director Console on AIX, you must install IBM Director Agent.
  - (IBM eServer BladeCenter JS20 blade servers only) To access IBM Director Console on an IBM eServer BladeCenter JS20 blade server you need a fast network connection to a workstation with a Virtual Network Computing (VNC) client or an X-Windows server.

Preparing to install IBM Director on an xSeries server

This topic provides information about preparing an xSeries server for the installation of IBM Director.

Before you install IBM Director on an xSeries server, consider the following information:

- **All components**
  - (Linux only) Make sure that the instance of IBM Director Agent running on the management server will be fully functional and able to send alerts to IBM Director Server. For the IBM Director Agent to be fully functional you might need to install service processor device drivers or the IBM LM78 and SMBus device drivers for Linux.
  - (Linux only) Before you install IBM Director on Red Hat Enterprise Linux AS and ES, version 3.0, make sure that the following RPM file is installed:

    compat-libstdc++-7.3-2.96.122.i386.rpm
  - (Linux only) Before you install IBM Director on Red Hat Enterprise Linux AS and ES, version 4.0, make sure that the following RPM files are installed:

    compat-libstdc++-296-2.96-132.7.2.i386.rpm
  - (Intel Itanium systems; Linux only) Before you install IBM Director on an 64-bit Intel Itanium system running Red Hat Enterprise Linux AS, version 4.0, for Intel Itanium, make sure that the following RPM file is installed:

    compat-libstdc++-33-3.2.3-47.3.ia64.rpm

- (Upgrades; Linux only) If you are upgrading from IBM Director, version 4.20 or later on SUSE LINUX Enterprise Server 9 for x86, ensure that the following RPM is installed:

  rpm-4.1.1-177.9.i586.rpm
- (Systems with IPMI Baseboard Management Controllers) The supporting IPMI device drivers and mapping layers must be installed. IBM Director cannot receive System Health Monitoring information if these drivers and mapping layers are not installed. The device drivers and mapping layers for Windows, Linux, and NetWare can be downloaded from the IBM Support Web site at www.ibm.com/pc/support.

  For eServer 325 or eServer 326 models, download and install the following items (the exact names of the files to download are dependent upon your operating system):
  - Microsoft Windows Installer (MSI) IPMI device drivers
  - IBM IPMI Library (mapping layer)

  For all other xSeries systems, download and install the following items (the exact names of the files to download are dependant upon your operating system):
  - OSA IPMI device drivers
  - IBM Mapping layer software source for OSA IPMI

  Important: You must install the device driver first and then install the mapping layer.

- **(Linux only) IBM Director Server**

  Before you install IBM Director on Red Hat Enterprise Linux AS and ES, version 4.0, make sure that the following RPM file is installed:

  compat-libstdc++-33-3.2.3-47.3.i386.rpm
- **(Linux only)Level 1: IBM Director Core Services and Level 2: IBM Director Agent**
  - If you want to use the Remote Session task on the managed system, make sure that the package that contains telnetd daemon is installed and configured. This is usually in the telnet_server_*version*.i386.RPM package, where *version* is the code level of your Linux distribution.

Service-processor device drivers:

This topic lists the service-processor device drivers that must be installed before installing IBM Director.

If you plan to install IBM Director Server or IBM Director Agent on an xSeries server that contains one of the following service processors, make sure that the service processor device driver has been installed:
- Advanced System Management processor
- Advanced System Management PCI Adapter
- Remote Supervisor Adapter
- Remote Supervisor Adapter II

IBM LM78 and SMBus device drivers for Linux:

This topic describes when to install the LM78 and SMBus device drivers for Linux.

If you plan to install IBM Director Server on an xSeries server running Linux, you might need to install either or both the LM78 and SMBus device drivers for Linux.

These device drivers ensure that certain IBM Director tasks and functions work correctly. The following table contains information about these device drivers, when they need to be installed, and what they do.

Table 108. Installing IBM Director Server: IBM LM78 and SMBus device drivers for Linux

Device driver	When it is needed	What it does
LM78	If either of the following conditions applies: • The server is one of the following servers: – eServer(TM) BladeCenter(TM) HS20, machine type 8832 – eServer BladeCenter HS20, machine type 8843 – eServer BladeCenter HS40, machine type 8839 – xSeries 225, machine type 8647 – xSeries 226, machine type 8836 – xSeries 236, machine type 8841 – xSeries 336, machine type 8837 – xSeries 346, machine type 8840 • The server contains an integrated systems management processor (ISMP).	The LM78 device driver ensures that IBM Director Server receives memory and processor Predictive Failure Analysis® (PFA) alerts.
SMBus	If the server does not contain one of the following service processors: • IPMI baseboard management controller • Remote Supervisor Adapter • Remote Supervisor Adapter II	The SMBus device driver ensures that the Management Processor Assistant tasks and System Health Monitoring function correctly.

Preparing to install the LM78 and SMBus device drivers:

This topic describes how to install the IBM LM78 and SMBus device drivers.

You must perform the following steps to install either the IBM LM78 or SMBus device driver:

1. Build a binary RPM file that is customized for the kernel version of the Linux operating system on your server. For instructions, see "Building the binary RPM file."
2. Install the binary RPM file on the system on which you will install IBM Director Server. For instructions, see "Installing the IBM LM78 or SMBus device driver" on page 163.

Building the binary RPM file:

This topic describes how to build the binary RPM files for the IBM LM78 or SMBus device drivers.

Ensure that the following conditions are met before building the binary RPM file:

- The system has Linux development and build capability.
- The Linux kernel source is installed and correctly configured.
- Any earlier versions of the LM78 or SMBus device drivers are uninstalled.

You must build the binary RPM file on a system with the same kernel version and hardware configuration as the system on which you will install IBM Director Server. Make sure that the hardware configuration is similar in regard to the number of processors and that any previous versions of the drivers have been uninstalled.

Note: If you are building on Red Hat Enterprise Linux ES, version 4.0 and the /usr/src/linux does not exist, perform the following steps:

1. From a command prompt, change to the /usr/src directory.
2. Type the following command and press **Enter**:

   ```
   ln -s ./kernels/<version>/ ./linux
   ```

   where <*version*> is the appropriate kernel subdirectory under /usr/src/kernels (for example, 2.6.9-5.EL-smp-i686), which matches the kernel the system is currently running.

Complete the following steps to build either the LM78 or SMBus device driver:

1. Copy the source file (ibmlm78-5.10-1.tgz for the LM78 driver or ibmsmb-5.10-1.tgz for the SMBus driver) to the SOURCES directory.
2. From a command prompt, change to the SOURCES directory.
3. Type one of the following commands and press **Enter**:

LM78 driver	SUSE LINUX Enterprise Server 8 for x86	`rpm -tb ibmlm78-5.10-1.tgz`
	All other supported Linux distributions	`rpmbuild -tb ibmlm78-5.10-1.tgz`
SMBus driver	SUSE LINUX Enterprise Server 8 for x86	`rpm -tb ibmsmb-5.10-1.tgz`
	All other supported Linux distributions	`rpmbuild -tb ibmsmb-5.10-1.tgz`

Running this command creates a binary RPM file in the RPMS/*architecture* directory, where *architecture* is one of the following strings:

- i586 (SUSE LINUX Enterprise Server 9 for x86
- i386 (all other 32-bit operating systems)
- X86_64 (64-bit operating systems)

Installing the IBM LM78 or SMBus device driver:

This topic describes how to install the IBM LM78 or SMBus device driver.

Before installing the IBM LM78 or SMBus drivers, you must build the binary RPM file. See "Building the binary RPM file" on page 162 for more information.

You can install the binary RPM file either on the server on which it was built or on another server that has the same Linux kernel and hardware configuration.

Complete the following steps to install either the IBM LM78 or SMBus device driver:

1. If you built the binary RPM file on another server, complete the following steps:

a. Make sure that any earlier versions of the device drivers have been uninstalled from the server where you will install version 5.10 of the device driver and IBM Director.

b. Copy the binary RPM file to an RPMS/*architecture* directory, where *architecture* is either i386 (for a 32-bit operating system) or X86_64 (for a 64-bit operating system).

Note: In this procedure, *driver* is one of the following strings:

For the IBM LM78 device driver	ibmlm78
For the IBM SMBus device driver	ibmsmb

2. Change to the RPMS/*architecture* directory.
3. From a command prompt, type the following command and press **Enter**:

```
rpm -ivh driver-5.10-1.architecture.rpm
```

where *architecture* is one of the following values:

- i386 (32-bit operating systems)
- X86_64 (64-bit operating systems)

Issuing this command performs the following tasks:

- Decompresses and untars the archive into the /usr/local/*driver* directory
- Copies the device driver, shared library, and all the configuration files to the appropriate locations
- Loads and starts the device driver

Uninstalling the IBM LM78 or SMBus device driver:

This section describes how to uninstall the IBM LM78 or SMBus device drivers.

Before you install the IBM LM78 or SMBus device driver, version 5.10, you must uninstall any previous versions of the drivers from the server.

Uninstalling the IBM LM78 or SMBus device driver, version 4.21 or later:

This topic describes how to uninstall the IBM LM78 or SMBus device driver, version 4.21 or later.

Note: For instructions about how to uninstall the IBM LM78 or SMBUS device driver, version 4.20 or earlier, see “Uninstalling the IBM LM78 driver, version 4.20 or earlier” on page 165 and “Uninstalling the IBM SMBus device driver, version 4.20 or earlier” on page 165.

To uninstall the IBM LM78 or SMBus device driver, version 4.21 or later, open a command prompt, type the following command, and press **Enter**:

```
rpm -e driver
```

where *driver* is one of the following strings:

For the IBM LM78 device driver	ibmlm78
For the IBM SMBus device driver	ibmsmb

Issuing this command unloads the device driver and removes all driver-related files from the server.

Uninstalling the IBM LM78 driver, version 4.20 or earlier:

This topic describes how to uninstall versions 4.20 or earlier of the IBM LM78 driver.

Note: For instructions about how to uninstall the IBM LM78 or SMBus driver, version 4.21 or later, see "Uninstalling the IBM LM78 or SMBus device driver, version 4.21 or later" on page 164.

To uninstall the IBM LM78 device driver, version 4.20 or earlier, complete the following steps:

1. To uninstall the binary RPM file, from a command prompt, type the following command and press **Enter**:
   ```
   rpm -e ibmlm78
   ```
2. To uninstall the source RPM file, open a command prompt, type the following command, and press **Enter**:

```
rpm -e ibmlm78-src-distribution
```

where *distribution* is one of the following strings:

For servers running Red Hat Linux or VMware ESX Server	redhat
For servers running SUSE LINUX	suse

Issuing this command unloads the device driver and removes all driver-related files from the server.

Uninstalling the IBM SMBus device driver, version 4.20 or earlier:

This topic describes how to uninstall the IBM SMBus device driver, versions 4.20 or earlier.

Note: For instructions about how to uninstall the SMBus device driver, version 4.21 or later, see "Uninstalling the IBM LM78 or SMBus device driver, version 4.21 or later" on page 164.

To uninstall the IBM SMBus device driver, version 4.20 or earlier, complete the following steps:

1. To uninstall the binary RPM file, from a command prompt, type the following command and press **Enter**:
   ```
   rpm -e ibmsmb
   ```
2. To uninstall the source RPM file, open a command prompt, type the following command, and press **Enter**:

```
rpm -e ibmsmb-src-distribution
```

where *distribution* is one of the following strings:

For servers running Red Hat Linux or VMware ESX Server	redhat
For servers running SUSE LINUX	suse

Issuing this command unloads the device driver and removes all driver-related files from the server.

Preparing to install IBM Director on a System z9 or zSeries server

This topic provides information about preparing a System z9 or zSeries server for the installation of IBM Director.

Before you install IBM Director on a System z9 or zSeries server, consider the following information:

- **All components**
  - Make the installation code available to your Linux on System z9 and zSeries. You can use the *IBM Director 5.10 for Linux on System z9 and zSeries* CD or the IBM Director Support Web site as the source of the installation code.

    System z9 and zSeries servers, typically, do not have directly attached CD-ROM drives. If you are using the CD, you might have to mount the CD on a different platform. Table 109 lists some methods of making the installation code available.

Table 109. Making the IBM Director installation code available to Linux on System z9 and zSeries

Method	**How to proceed**
NFS server	1. Mount the CD on an NFS server. You might already have set up an NFS server for installing Linux. The steps for mounting the CD depend on the platform on which the NFS server runs. Refer to the installation information for that platform for details. 2. Access the NFS server from your Linux on System z9 and zSeries system.

ISO image	1. Mount the CD on the platform of your choice.
	The steps for mounting the CD depend on the platform. Refer to the installation information for that platform for details.
	2. Create an ISO image. For example, if you are accessing the CD from Linux, you can issue a command of this form:
	`dd if=/dev/cdrom of=./iso_file_name`
	where */dev/cdrom* is the device node for the CD-ROM drive and *iso_file_name* is the name of the ISO image.
	3. Transfer the ISO image to your Linux on System z9 and zSeries, for example, with FTP.
	4. On the Linux on System z9 and zSeries system, mount the ISO image through a loopback device:
	`mount -o loop iso_file_name /mnt`
	where *iso_file_name* is the name of the ISO image and */mnt* the mount point of the file system.

Web download	1. To obtain the tar file with the installation code go to the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/ 2. Decompress the contents of the tar file to a local directory.

  - Ensure that the following RPMs are installed:

    Table 110. Required RPMs

Red Hat Enterprise Linux AS, version 4.0	31-bit	`compat-libstdc++-295-2.95.3-81.s390.rpm` `compat-libstdc++-33-3.2.3-47.3.s390.rpm`
	64-bit	`compat-libstdc++-295-2.95.3-81.s390x.rpm` `compat-libstdc++-33-3.2.3-47.3.s390x.rpm`
SUSE LINUX Enterprise Server 9	31-bit	`compat-2004.7.1-1.2.s390.rpm`
	64-bit	`compat-2004.7.1-1.2.s390x.rpm` `compat-32bit-9-200407011411.s390x.rpm`

- **Level 1: IBM Director Core Services**

  Make sure that SSH is available.
- **Level 2: IBM Director Agent**
  - Make sure that SSH is available.
  - Ensure that the CPINT RPM is installed.

    This RPM is shipped with SUSE LINUX Enterprise Server 9.

    For Red Hat Enterprise Linux AS, you can download the RPM from linuxvm.org/Patches/. You need version 2.5.3 or later.

    Note: Be aware that installing the RPM on Red Hat Linux AS might affect any support contract you may have for the distribution.
- **IBM Director Console**

  To access IBM Director Console on Linux on System z9 and zSeries you need a fast network connection to a workstation with a Virtual Network Computing (VNC) client or an X-Windows server.
- If you want to use IBM Director Server on System z9 or zSeries for heterogeneous management, you require agents for the platforms to be managed. You can obtain these agents from the *IBM Director Agents for AIX 5L, i5/OS, Windows, Linux on xSeries, System z9, zSeries and POWER* CD.

Preparing Level-1 managed systems

This topic describes procedures for preparing systems for Level-1 management with IBM Director Core Services.

Perform the following steps on *each* system to be managed with IBM Director Core Services:

1. Set the clock on the managed system to match the time of the management server. If the managed system time is earlier than that of the management server, the management server will be unable to unlock the managed system.

   To avoid the problem of system-time mismatch, you can configure managed systems and the management server to synchronize their clocks using a common network time protocol (NTP) server.
2. (Level-1 managed systems with ServeRAID controllers only) In order for the management server to receive inventory data and events information from the system, you must install the ServeRAID Manager software that was included with the controller.
3. The chkconfig bug fix for Red Hat Enterprise Linux AS, ES, and WS, version 3.0 must be installed on Level-1 managed systems running the following operating systems:
   - Red Hat Enterprise Linux AS, version 3.0

- Red Hat Enterprise Linux ES, version 3.0
- Red Hat Enterprise Linux WS, version 3.0

IBM Director Server might not discover these systems if the chkconfig bug fix is not installed.

For more information about the chkconfig bug fix and how to download it, go to rhn.redhat.com/errata/RHBA-2005-116.html.

Preparing Windows XP managed systems

This topic describes procedures for preparing Windows XP systems for discovery by IBM Director Server.

Typically, managed systems are first discovered using IBM Director Server. Then, IBM Director Core Services or IBM Director Agent is installed on the managed systems directly from IBM Director Console. However, the configuration of some Windows XP managed systems can prevent discovery by IBM Director Server.

Perform the following steps on *each* Windows XP system to enable discovery by IBM Director Server:

1. Disable Simple File Sharing. Windows XP targets must have Simple File Sharing disabled for Level 0 discovery to work. Use the following steps to disable Simple File Sharing on the Windows XP system to be managed:
   a. Select **Start** → **Control Panel** → **Folder Options**.
   b. In the Folder Options window, click the **View** tab.
   c. In the **View** panel, scroll to the bottom of the **Advanced settings** list and clear the **Use simple file sharing (Recommended)** check box.
   d. Click **OK**.
2. Configure Windows Firewall (Internet Connection Firewall) to allow access by IBM Director Server. Windows XP (before Service Pack 2) includes a built-in firewall called Internet Connection Firewall (ICF), which is disabled by default. Windows XP Service Pack 2 includes Windows Firewall, which is enabled by default. Either firewall will block attempted accesses by Level 0 discovery unless the firewall is disabled or an exception is defined for the management server on which IBM Director Server is installed.

   Use the following steps to enable IBM Director Server to access the managed system:
   a. Select **Start** → **Control Panel** → **Network Connections** → *connection*. The *connection* is the network connection that will be used for discovery. Typically, this is Local Area Connection.
   b. In the **General** tab of the connection status window, click **Properties**.
   c. In the connection properties window, click the **Advanced** tab.
   d. In the **Advanced** panel, click the firewall **Settings** button.
   e. If the firewall is turned off, no further configuration is required. Continue to step 3.
   f. If the firewall is enabled, click the **Exceptions** tab.
   g. In the **Exceptions** panel, select the **File and Printer Sharing** check box.
   h. Click **OK**.

   Note: The network administrator can define a group policy for this configuration.
3. Verify that remote registry administration is enabled. Remote registry administration must be enabled in order for Level 0 discovery to run

commands and execute scripts on the managed system. The default setting for remote registry administration on Windows XP systems is enabled. Use the following steps to verify or change the remote registry administration setting:

   a. At a command prompt, type `%SystemRoot%\system32\services.msc /s` and press **Enter**.
   b. In the list of services in the Services window, right-click the **Remote Registry** service and select **Properties** from the menu.
   c. On the General page, set the **Startup type** to **Automatic**.
   d. If the Service status is not Started, click **Start**.
   e. Click **OK** to apply the new settings and close the window.

4. Verify the hidden administrative disk shares (such as C$, D$, etc). The default hidden administrative disk shares (such as C$, D$, and so on) are required for correct operation of Level 0 discovery.

Preparing your System z9 or zSeries environment for z/VM Center

Before you can use z/VM Center, you need to perform some setup tasks on the System z9 or zSeries mainframe.

z/VM Center will operate with z/VM 5.1 and z/VM 5.2 systems that are installed on IBM System z9 or eserver zSeries hardware. There are some setup tasks that you need to perform on each z/VM for which you want to use z/VM Center.

Some of these tasks are setup tasks for the z/VM system itself other tasks involve setting up a special z/VM guest virtual machine, the z/VM manageability access point. The z/VM manageability access point acts as an agent to z/VM Center and uses the z/VM systems management API, the z/VM directory manager interface, and the z/VM control program to perform z/VM Center tasks.

If your installation uses a security manager (for example, RACF) in addition to the built-in z/VM security, you might have to supplement or replace the privileges and permissions described in this section with privileges or permissions granted through your security manager.

Setting up your z/VM for z/VM Center

The Common Information Model (CIM) profile for z/VM management requires a directory manager product. You must set up disk pools to be used by the directory manager. You must also set up the systems management API, and Virtual Machine Resource Manager (VMRM).

Before you start: If you are using z/VM 5.1, you require the PTFs for APAR VM63804.

z/VM Center restrictions:

This topic describes z/VM Center restrictions you should be aware of when preparing z/VM for z/VM Center.

- For its provisioning tasks, z/VM Center cannot work with disk resources other than minidisks that are made available in form of disk pools (allocation groups).
- z/VM directory displays data on guest virtual machines as it is defined in the z/VM directory. Dynamic changes—for example, through a CP command—are not reflected. The displayed information comprises:

User IDs:
name, password and privilege class

Processors:
all static information

Memory:
initial size and maximum size

Minidisks:
MDISK and LINK definitions, dedicated disks are omitted

NetworkPorts:
OSA and HiperSocket, Guest LAN, VSWITCH

- z/VM Center only recognizes a set of virtual OSA devices as a virtual OSA adaptor if three dedicate statements are contiguously defined in the z/VM directory and three consecutive device numbers are assigned.
- VLAN is not supported. You can use virtual switches. If you use z/VM Center to create guest virtual machines that use a virtual switch, the authorizations for using the switch are not persistent across a z/VM system restart. To assure that the required authorizations are granted after a z/VM restart you can:
  - Add the required SET VSWITCH statements to a z/VM configuration file that is processed during IPL (for example, to SYSTEM CONFIG). You can check $VMAPI/.vmapi/vswitch.grant as guidance on which statements to add to SYSTEM CONFIG.
  - Run $VMAPI/.vmapi/vswitch.grant your z/VM manageability access point.
- z/VM Center requires that operating systems that run on a z/VM virtual server must have network ports. You cannot register an operating system for a z/VM virtual server that has no network ports. Accepted network port types are OSA and HiperSocket, guest LAN, and VSWITCH.

Preparing the directory manager:

z/VM Center requires a directory manager to manage z/VM guest virtual machines.

Before you start:

- If you are using DirMaint™ as your directory manager, you will need DirMaint FL510 with the PTFs for APARs VM63700, VM63733, and VM63639.
- To perform this task you need access to the z/VM MAINT user ID or an alternative user ID that is authorized to issue commands for your directory manager.

z/VM maintains information about its guest virtual machines in the z/VM directory. The z/VM directory contains an entry for each guest virtual machine. Each entry consists of a set of directory statements that define the guest virtual machine in terms of the resources and attributes that are assigned to it.

The installation and customization of a directory manager is product-dependent. For illustration purposes, this topic describes how to set up IBM z/VM Directory Maintenance Facility (DirMaint) for z/VM Center. DirMaint is shipped with z/VM but you must obtain a license for using it.

If you are using DirMaint as the directory manager, complete the following steps. If you are using another directory manager, refer to the product documentation of your directory manager and perform equivalent steps.

1. Define tagged comments. z/VM Center requires tagged comments to store operating system information within z/VM directory records.
   a. On your z/VM, establish a CMS session with your MAINT user ID or with your alternative user ID.
   b. Query the tagged comments that are already defined for your z/VM. Issue:

      ```
      DIRM DEFINESTAG ? ALL
      ```

      z/VM issues a number of DVHDST3404I messages. Messages that inform you of an existing tagged comment are of the form *tagname nnn*, where *tagname* is a unique comment name that begins with an asterisk (*) and ends with a colon (:) and *nnn* is a unique number for the comment.

      Example: In the following sample output, the existing tagged comments have the names *STAGVAR1: and *STAGVAR2: and use the numbers 000 and 001:

      ```
      DVHREQ2288I Your DEFINESTAG request ...
      DVHDST3404I The current ...
      DVHDST3404I tagname sortorder.
      DVHDST3404I *STAGVAR1: 000
      DVHDST3404I *STAGVAR2: 001
      DVHREQ2289I Your DEFINESTAG request ...
      ```
   c. Verify whether the existing tagged comments include:
      - *CIMGOS01:
      - *CIMIMG:
   d. Ensure that there are tagged comments of the form *CIMNIC*mm*:, where *mm* is a 2-digit decimal number from 01 to 99.

      The number of these tagged comment variables limits the number of network interfaces you can clone for a z/VM virtual server. Define as many tagged comments of this form as the number of interfaces you expect to use on any one of your z/VM virtual servers. You can define more tagged comments as the need arises.
   e. If either of the tagged comments from step 1c do not already exist or if there are not enough tagged comments of the form *CIMNIC*mm*:, define them. For each missing comment, issue a command of the form:

      ```
      DIRM DEFINESTAG CREATE tagname nnn
      ```

      where *tagname* is the name of the missing comment and *nnn* is any 3-digit decimal number that is unique for the tagged comment.

      Example:

      ```
      DIRM DEFINESTAG CREATE *CIMGOS01: 100
      DIRM DEFINESTAG CREATE *CIMIMG:   101
      DIRM DEFINESTAG CREATE *CIMNIC01: 102
      DIRM DEFINESTAG CREATE *CIMNIC02: 103
      DIRM DEFINESTAG CREATE *CIMNIC03: 104
      ```

      In this example, three tagged comments of the form *CIMNIC*mm*: have been defined. With this setup, all z/VM virtual server that are created by z/VM Center are limited to three network interfaces.
2. Ensure that the following setting is made in your local CONFIGxx DATADVH member for DIRMAINT:

   ```
   ALLOW_ASUSER_NOPASS_FROM= VSMSERVE *
   ```
3. **Optional:** If you are an experienced z/VM system programmer, you might want to define one or more z/VM virtual server prototypes.

   In a prototype, you specify defaults that you can use when you create z/VM virtual servers with z/VM Center.

Refer to the description of the DIRM ADD command in *z/VM Directory Maintenance Facility Commands Reference*, SC24-6133, for details.

4. **Optional:** Define additional z/VM DATAMOVE service machines for copying disks.

   A DATAMOVE server is a z/VM service machine that has the privileges to perform disk copy operations. For disk copy operations z/VM Center requires at least one DATAMOVE server.

   Multiple DATAMOVE servers might allow you to simultaneously clone multiple systems. For details, refer to *z/VM Directory Maintenance Facility Tailoring and Administration Guide*, SC24-6024.

Create a NOLOG user ID for reserved OSA devices:

Assign OSA devices that z/VM Center is not to assign to a z/VM virtual server to a NOLOG user ID.

When z/VM Center requires an OSA device for a z/VM virtual machine, the z/VM manageability access point checks the z/VM directory to establish which devices have already been assigned to other user IDs. This check does not account for OSA devices that have been dynamically assigned to other user IDs by a class B attach command, or that are reserved for other purposes without being explicitly assigned in the z/VM directory. For example, the check does not account for network devices that are defined to the TCPIP user ID in the TCPIP DTCPARMS file. See *z/VM TCP/IP Planning and Customization*, 1.0 SC24-6125, for details.

For example, z/VM Center might attempt to assign an OSA device to a z/VM virtual server if the OSA device has already been assigned to another guest virtual machine by a script. z/VM Center might also assign OSA devices that installation-specific policies reserve for particular guest virtual machines.

Complete these steps to assign OSA devices to a NOLOG user ID:

Create a z/VM directory entry of the following form:

```
USER USERID NOLOG
  DEDICATE rlnm rlnm
  ...
  DEDICATE wxyz wxyz
```

where *USERID* is the NOLOG user ID and *rlnm* and *wxyz* are device numbers you want to prevent z/VM Center from using. Be sure to always include the complete triplets of device numbers that correspond to an OSA device.

Example: The following z/VM directory entry prevents z/VM Center from using device numbers 5200 through 5229 (that is, 10 specific OSA devices).

```
USER $DEVICE$ NOLOG
  DEDICATE 5200 5200
  DEDICATE 5201 5201
  ...
  DEDICATE 5228 5228
  DEDICATE 5229 5229
```

Result: the z/VM manageability access point finds the devices that are dedicated to the NOLOG user ID in the z/VM directory, regards them as already belonging to another guest virtual machine, and does not assign them to a z/VM virtual server. Because the NOLOG user ID is never actually logged, these devices remain free for their intended purpose.

Configuring the z/VM systems management API:

z/VM Center uses the z/VM systems management API that is provided by the VSMSERVE service machine.

VSMSERVE is essential for z/VM Center and must be operational.

For instructions on setting up the VSMSERVE server refer to *z/VM Systems Management Application Programming*, SC24-6122.

Setting up the z/VM resource manager:

The Server Complexes task uses z/VM Resource Manager (VMRM) to manage performance goals for Linux guest systems.

VMRM manages performance goals that are defined in a configuration file. The Server Complexes task requires that this file resides in the z/VM shared file system (SFS). You need to set up an initial configuration file. When you enter performance goals through the Server Complexes user interface, Server Complexes writes statements to the VMRM configuration file to represent your goals in VMRM syntax.

For more information on VMRM, refer to *z/VM Performance*, SC24-6109. For more information on the SFS refer to *CMS File Pool Planning, Administration, and Operation*, SC24-6074.

You can set up VMRM easily by using the default configuration file VMRM CONFIG VMSYS:VMRMSVM. If the default configuration file is not suitable for your installation, you can set up a custom configuration file.

Using the default name and location for the VMRM configuration file:

By default, VMRM uses VMRM CONFIG VMSYS:VMRMSVM as the configuration file.

Before you start: To perform this task you need access to the z/VM MAINT user ID or an alternative user ID that is authorized to issue commands for your directory manager.

Complete the following steps to set up VMRM using the default configuration file name and location:

1. Add the VSMSERVE server and the administrator ID for the z/VM manageability access point (see "Authorizing an administrator ID for the z/VM manageability access point" on page 180) as a user of the VMSYS file pool. From a MAINT CMS session, issue:

   ```
   ENROLL USER VSMSERVE
   ENROLL USER MAPAUTH
   ```

   where *MAPAUTH* is the administrator ID.
2. Make the SFS accessible to VMRM. Add the following lines to the PROFILE EXEC of VMRMSVM:

   ```
   SET FILEPOOL VMSYS:
   ACCESS VMSYS:.Z
   ```

   Run the PROFILE EXEC to make the changes take effect.

3. Create an empty VMRM configuration file, VMRM CONFIG, in the SFS directory VMSYS:VMRMSVM.
4. In the VMRM configuration file, include the following ADMIN statement:
   ```
   ADMIN MSGUSER VMRMADMN NEWCFG VMRM CONFIG VMSYS:VMRMSVM.
   ```
5. Add dummy WORKLOAD, GOAL, and MANAGE statements. The dummy statements are not used for goal management but are required to satisfy the configuration file syntax. Include, for example, the following lines:
   ```
   WORKLOAD work1 USER dummy
   GOAL goal1 VELOCITY CPU 10 DASD 10
   MANAGE work1 GOAL goal1 IMPORTANCE 5
   ```

   Server Complexes creates additional statements that are used for goal management. These additional statements use the prefix “D4Z”. Do not use dummy statements with this prefix for workload and goal names.

   If you need to assure sufficient resources for one or more essential z/VM components you can set actual VMRM goals for these components instead of using dummy statements. Examples of essential components are TCPIP, PORTMAP, VSMSERVE, RACFVM, DIRMAINT, or DATAMOVE. You might already have assured sufficient resources by alternate methods, for example, with a high share, QUICKDSP, or reserved pages.

   The completed configuration file might look like this, for example:
   ```
   ADMIN MSGUSER VMRMADMN NEWCFG VMRM CONFIG VMSYS:VMRMSVM.
   WORKLOAD work1 USER dummy
   GOAL goal1 VELOCITY CPU 10 DASD 10
   MANAGE work1 GOAL goal1 IMPORTANCE 5
   ```
6. Ensure that the administrator ID of the z/VM manageability access point has write access to the VMRM config file. As VMRMSVM issue:
   ```
   grant auth vmsys:vmrmsvm. to MAPAUTH (write newwrite
   grant auth vmsys:vmrmsvm. to VSMSERVE (write newwrite
   grant auth * * Z to MAPAUTH (write
   grant auth * * Z to VSMSERVE (write
   ```

   where *MAPAUTH* is the administrator ID of the z/VM manageability access point.
7. Ensure that the VMRM service machine is started automatically when z/VM is started. Include the following lines in the PROFILE EXEC of z/VM user ID AUTOLOG1 (AUTOLOG2 if you are using a security manager in addition to the built-in z/VM security):
   ```
   XAUTOLOG VMRMSVM
   ```

   You might also want to provide an XAUTOLOG statement for VMRMADMN if you want messages to go to VMRMADMN.
8. **Optional:** You can include VMRMSVM in the configuration of the TCPIP service machine to ensure that it is automatically restarted if they fail.

   For example, add VMRMSVM to the Autolog statement in the configuration file of the TCPIP service machine:
   ```
   AUTOLOG
   ...
     VMRMSVM  0           ; VSM SERVER
   ENDAUTOLOG
   ```
   Refer to *z/VM TCP/IP Planning and Customization*, 1.0 SC24-6125, for more details.

Using a custom name and location for the VMRM configuration file:

The Server Complexes task uses z/VM Resource Manager (VMRM) to manage performance goals for Linux guest systems.

Before you start: To perform this task you need access to the z/VM MAINT user ID or an alternative user ID that is authorized to issue commands for your directory manager.

Complete the following steps to use set up VMRM using the default configuration file name and location:

1. Add the VSMSERVE server and the administrator ID for the z/VM manageability access point (see “Authorizing an administrator ID for the z/VM manageability access point” on page 180) as a user of the VMSYS file pool. From a MAINT CMS session, issue:

   ```
   ENROLL USER VSMSERVE
   ENROLL USER MAPAUTH
   ```

   where *MAPAUTH* is the administrator ID.
2. Make the SFS accessible to VMRM; add the following lines to the PROFILE EXEC of VMRMSVM:

   ```
   SET FILEPOOL POOL:
   ACCESS POOL:DIRECTORY.MODE
   ```

   where *POOL* is the name of the file pool you want to use, *DIRECTORY* is the directory where the configuration file is to reside in the file pool, and *MODE* is the uppercase letter that specifies the file mode for the file pool.

   Run the PROFILE EXEC to make the changes take effect.

   Example:

   ```
   SET FILEPOOL MYPOOL:
   ACCESS MYPOOL:MYDIR.Z
   ```
3. In the PROFILE EXEC of VMRMSVM, specify the file you want to use as the configuration file. Include a statement of the following form:

   ```
   EXEC IRMSERV NAME CONFIG MODE
   ```

   where *NAME* is the file name of the configuration file you want to use and *MODE* is the file mode.

   Example:

   ```
   EXEC IRMSERV MYVMRM CONFIG Z
   ```
4. Create an empty VMRM configuration file with the file name and in the SFS directory of your choice.
5. In the VMRM configuration file, include a line with an ADMIN statement of this form:

   ```
   ADMIN MSGUSER VMRMADMN NEWCFG NAME CONFIG POOL:DIRECTORY.MODE
   ```

   where the variables have the same meaning as in the examples above.

   Example:

   ```
   ADMIN MSGUSER VMRMADMN NEWCFG MYVMRM CONFIG MYPOOL:MYDIR.
   ```
6. Add a triplet of dummies for WORKLOAD, GOAL, and MANAGE statements. The dummy statements are not used for goal management but are required to satisfy the configuration file syntax. Include, for example, the following lines:

   ```
   WORKLOAD work1 USER dummy
   GOAL goal1 VELOCITY CPU 10 DASD 10
   MANAGE work1 GOAL goal1 IMPORTANCE 5
   ```

Server Complexes creates additional statements that are used for goal management. These additional statements use the prefix "D4Z". Do not use dummy statements with this prefix for workload and goal names.

If you need to assure sufficient resources for one or more essential z/VM components you can set actual VMRM goals for these components instead of using dummy statements. Examples of essential components are TCPIP, PORTMAP, VSMSERVE, RACFVM, DIRMAINT, or DATAMOVE. You might already have assured sufficient resources by alternate methods, for example, with a high share, QUICKDSP, or reserved pages.

Example: The completed configuration file might look like this:

```
ADMIN MSGUSER VMRMADMN NEWCFG MYVVMRM CONFIG MYPOOL:MYDIR.
WORKLOAD work1 USER dummy
GOAL goal1 VELOCITY CPU 10 DASD 10
MANAGE work1 GOAL goal1 IMPORTANCE 5
```

7. Ensure that the VMRM service machine is started automatically when z/VM is started. Include the following lines in the PROFILE EXEC of z/VM user ID AUTOLOG1 (AUTOLOG2 if you are using a security manager in addition to the built-in z/VM security)::

   ```
   XAUTOLOG VMRMSVM
   ```

   You might also want to provide an XAUTOLOG statement for VMRMADMN if you want messages to go to VMRMADMN.
8. On the z/VM manageability access point, ensure that the file ~root/.cimvm/properties/CimVm.properties exists. Create an empty file if it doesn't exist.
9. Add a line of the following form to ~root/.cimvm/properties/CimVm.properties:

   ```
   VmrmConfigFile=NAME CONFIG POOL:DIRECTORY.
   ```

   Example:

   ```
   VmrmConfigFile=MYVMRM CONFIG MYPOOL:MYDIR.
   ```
10. Ensure that VSMSERVE and the administrator ID of the z/VM manageability access point have write access to the VMRM config file. As VMRMSVM issue:

    ```
    grant auth POOL:DIRECTORY. to MAPAUTH (write newwrite
    grant auth POOL:DIRECTORY. to VSMSERVE (write newwrite
    grant auth * * Z to MAPAUTH (write
    grant auth * * Z to VSMSERVE (write
    ```

    where *MAPAUTH* is the administrator ID of the z/VM manageability access point and *POOL:DIRECTORY* specifies the configuration file.
11. **Optional:** You can include VMRMSVM in the configuration of the TCPIP service machine to ensure that it is automatically restarted if they fail.

    For example, add VMRMSVM to the Autolog statement in the configuration file of the TCPIP service machine:

    ```
    AUTOLOG
    ...
      VMRMSVM  0           ; VSM SERVER
    ENDAUTOLOG
    ```

    Refer to *z/VM TCP/IP Planning and Customization*, 1.0 SC24-6125, for more details.

Defining allocation groups:

Allocation groups are logical groupings of disk spaces.

z/VM Center requires disk resources for maintaining templates and for creating z/VM virtual servers and their operating systems. z/VM Center needs these disk resources in the form of disk pools. Outside z/VM Center disk pools are known as *allocation groups*.

Allocation groups are composed of regions. A region defines a single contiguous area on a single DASD volume. An allocation group typically includes regions from numerous disks.

To add disk space from a particular disk to an allocation group, you first define one or more regions that cover the available disk space. You then assign the regions to the allocation group.

Example: This example shows several 3390-9 and 3390-27 DASD volumes that have been allocated as regions in a pool in the DirMaint EXTENT CONTROL file:

```
:REGIONS.
  *RegionId  VolSer    RegStart      RegEnd  Dev-Type  Comments
  REG0       VMAU00    0001          10016   3390-09
  REG1       VMAU01    0001          10016   3390-09
  REG2       VMAU02    0001          32759   3390-32K
  REG3       VMAU03    0001          10016   3390-09
  REG4       VMAU04    0001          10016   3390-09
  REG5       VMAU05    0001          32759   3390-32K
  REG6       VMAU06    0001          10016   3390-09
  REG7       VMAU07    0001          10016   3390-09
  REG8       VMAU08    0001          32759   3390-32K
  REG9       VMAU09    0001          10016   3390-09
  REGA       VMAU0A    0001          10016   3390-09
:END.
:GROUPS.
  *GroupName RegionList
  POOL0      (ALLOCATE ROTATING)
  POOL0      REG0 REG1 REG2 REG3 REG4 REG5 REG6 REG7 REG8 REG9 REGA
:END.
```

Be sure that the volumes that to be added to a pool are formatted with CPFMTXA before attempting to use them. Regions do not have to occupy an entire volume, but they do have to be allocated on DASD volumes, not minidisks. Regions can be placed on a volume beside minidisks of other users.

For more information on allocation groups refer to *z/VM Directory Maintenance Facility Tailoring and Administration Guide*, SC24-6024.

Defining a custom user class:

You can optionally define a user class with the privileges required by the administrator ID of the z/VM manageability access point.

Before you start: To perform this task you need access to the z/VM MAINT user ID or an alternative user ID that is authorized to issue commands for your directory manager.

A user class defines the privileges that a z/VM user ID has on the z/VM system. A user class is represented by an uppercase letter or by one of the numbers 1 - 6. Classes A - H are predefined by z/VM but can be modified for a particular z/VM installation; the remaining classes are always installation-specific.

1. Establish a CMS session with your MAINT user ID or with your alternative user ID.

2. Identify an eligible character that is not already used for a user class. Check the SYSTEM CONFIG file to find out which characters are free.
3. Add the following lines to the SYSTEM CONFIG file:

   ```
   SET      Subcmd Vswitch      IBMclass B PRIVclass BX
   QUERY    Subcmd *            IBMclass B PRIVclass BX
   IND                          IBMclass E PRIVclass EX
   QUERY    Subcmd *            IBMclass G PRIVclass GX
   LINK                         IBMclass G PRIVclass GX
   ```

   where *X* is the free character.

   You have to make the changes in the SYSTEM CONFIG file active through an IPL or dynamically. For example you can issue the following commands:

   ```
   MODIFY SET       Subcmd Vswitch      IBMclass B PRIVclass BX
   MODIFY QUERY     Subcmd *            IBMclass B PRIVclass BX
   MODIFY IND                           IBMclass E PRIVclass EX
   MODIFY QUERY     Subcmd *            IBMclass G PRIVclass GX
   MODIFY LINK                          IBMclass G PRIVclass GX
   ```

   For details, refer to *CP Planning and Administration*, SC24-6083.

You can now employ user classes G and *X* to provide the administrator ID of the z/VM manageability access point with only the privileges that are required.

Setting up the z/VM manageability access point

The z/VM manageability access point is a z/VM guest virtual machine that implements a CIM instrumentation for z/VM management.

In the Common Information Model (CIM), the units in which manageability functions are implemented are called *management profiles*. The z/VM manageability access point implements the z/VM management profile. IBM Director uses the manageability access point for all interactions with z/VM. The z/VM management profile can be used by any z/VM systems management application.

You need one z/VM manageability access point on each z/VM system on which you want to use z/VM Center. You must not set up multiple z/VM manageability access points on the same z/VM system.

For more information on CIM visit dmtf.org

Creating a z/VM guest virtual machine for the z/VM manageability access point:

You must create a z/VM guest virtual machine for the z/VM manageability access point. This topic provides the steps for creating a guest virtual machine and describes the parameters you need for a z/VM manageability access point.

Before you start: You need access to the z/VM MAINT user ID or an alternative user ID that is authorized to issue commands for your directory manager..

Complete the following steps to create a z/VM guest virtual machine for the z/VM manageability access point:

1. Establish a CMS session with your MAINT user ID or with your alternative user ID.
2. Create a CMS file of the form *USERID* DIRECT, where *USERID* is the user ID you want to use for the guest virtual machine. “MAP” is the preferred user ID for the z/VM manageability access point.

3. In the new CMS file, specify a directory entry for the guest virtual machine and save the file.

   For example, the directory entry contains statements of this form:

   ```
   USER USERID PASSWORD 512M 1G BEG
      IPL BOOTDISK
      SPOOLSPEC
      CONDEF
      OPTION LNKNOPAS LANG AMENG
      DISKSPEC
   ```

   where:

   USERID
   : is your user ID for the z/VM manageability access point.

   PASSWORD
   : is the logon password for the z/VM user ID defined in this directory entry. The logon password is required for starting the management access point from a 3270 terminal session unless a security manager is used in addition to the z/VM security.

     Be sure to use a password that adheres to the security policies at your installation.

     If an additional security manager, such as Resource Access Control Facility (RACF), is used, the password defined in the resource manager overrides the password specified in the user entry. See “Security manager” on page 73 for more information on this issue.

   512M 1G
   : are the minimal specifications for the initial and maximum virtual storage sizes. The virtual storage is the main memory of the guest virtual machine.

   BEG
   : are privilege classes that provide the z/VM manageability access point with sufficient privileges in terms of predefined privilege classes. Classes BEG, as predefined when z/VM is installed, assign more privileges than required.

     According to good-practice rules you should not assign more privileges than necessary. See “Defining a custom user class” on page 177 to define a custom privilege class that defines the minimum set of required privileges. If you have defined a custom class *X*, then G*X* would be correct here.

   IPL *BOOTDISK*
   : specifies the disk that is to serve as the boot disk for the Linux instance on the z/VM manageability access point, where *BOOTDISK* is the device number of the boot disk.

   SPOOLSPEC
   : adds the typical spool devices: reader, punch, and printer (RDR, PUN, PRT).

   CONDEF
   : can be one or more statements that define real or virtual network connections, for example, to OSA adapters, virtual switches, or guest LANs. At a minimum you must define a connection to the z/VM TCP/IP stack.

     See *z/VM Connectivity*, SC24-6080, for details about networking for z/VM guest virtual machines.

If you define a connection to a virtual switch, be sure to include an additional statement that authorizes the z/VM manageability access point to access the virtual switch.

OPTION LNKNOPAS LANG AMENG
specifies options that:

- Bypass the password authorization. This is required for automatically running a personalization script when a Linux instance is deployed on a z/VM virtual server.
- Specify American English to be used within the z/VM manageability access point. This is required because the z/VM manageability access point parses responses from z/VM control program commands.

If you are using a security manager (for example, RACF), there might be additional authorization requirements. Refer to the documentation of the respective security manager.

DISKSPEC
can be one or more statements that define disks. At a minimum you must include a statement for the boot disk of the IPL statement and any other Linux system disks.

Using MAP as the user ID, the directory entry might look like this example:

```
USER MAP MAPPW 512M 1G BEG
   IPL 200
   SPOOL 000C 2540 READER *
   SPOOL 000D 2540 PUNCH A
   SPOOL 000E 1403 A
   NICDEF 5000 TYPE QDIO LAN SYSTEM SWITCH1
   OPTION LNKNOPAS LANG AMENG
   LINK MAINT 190 190 RR
   LINK MAINT 19E 19E RR
   MDISK 191 3390 1 10 VOL001 MR
   MDISK 200 3390 AUTOG 3338 POOL1 MR
```

This example includes a virtual switch SWITCH1. The statement that provides MAP with access to that switch might read:

```
SET VSWITCH SWITCH1 GRANT MAP
```

4. Add the directory entry to the z/VM directory. Issue `DIRM FOR` *`USERID`* `ADD`, where *USERID* is the user ID you used in the previous steps.

Authorizing an administrator ID for the z/VM manageability access point:

You need to authorize a z/VM user ID that the z/VM manageability access point can use to access the z/VM systems management API and for some of the DirMaint functions.

When you use z/VM Center to work with a particular z/VM system for the first time, you need to specify the administrator ID of the z/VM manageability access point. The z/VM manageability access point uses this ID to perform functions of the z/VM systems management API and of DirMaint.

Depending on the security regulations for your installation, you have the following options:

- Specify the user ID of the z/VM manageability access point as the administrator ID.
- Define a separate user ID for the administrator.

- If the security policies at your installation permit it, you can specify MAINT as the administrator ID. MAINT already has all required authorizations. If you use MAINT as the administrator ID, have completed the authorization of a z/VM user ID.

Complete the following steps to authorize a z/VM user ID other than MAINT:

1. Establish a CMS session with your MAINT user ID.
2. If the user ID you want to use as the administrator does not exist yet, create it now.
   a. Create a CMS file *MAPAUTH* DIRECT, where *MAPAUTH* is the user ID you want to use.
   b. In the file, type a directory entry. At a minimum you must provide a user statement of this form:

      ```
      USER MAPAUTH PASSWORD
      ```

      where *MAPAUTH* is the user ID and *PASSWORD* is the password.

      Example:

      ```
      USER ADMIN SECR2ET
      ```
3. Establish a CMS session with the z/VM service machine that provides the z/VM systems management API. This is usually the guest virtual machine with the z/VM user ID VSMSERVE.
4. Re-IPL CMS in the service machine to stop the remote process call (RPC) server program.
5. When prompted, enter any non-blank reply to prevent the server program from being restarted.
6. Open the VSMSERVE AUTHLIST file with the CMS editor.
7. Add a line of the following form and save the file:

   ```
   MAPAUTH                             ALL                                      ALL
   ```

   The user ID *MAPAUTH* must begin at column 1, followed by ALL in column 66 and another ALL in column 131.

   This line permits *MAPAUTH* (at column 1)
   to target any guest virtual machine (ALL at column 66)
   with any command provided by the z/VM systems management API (ALL at column 131).
8. Issue commands of this form to authorize the administrator user ID for DirMaint.:

   ```
   DIRM FOR ALL AUTHFOR MAPAUTH CMDLEVEL 140A CMDSET ADGHMOPS
   DIRM FOR ALL AUTHFOR MAPAUTH CMDLEVEL 150A CMDSET ADGHMOPS
   ```

   where *MAPAUTH* is the user ID you have decided to use as the administrator ID. ADGHMOPS are authorization classes specific to DirMaint.

Setting up communications for the z/VM manageability access point:

You must set up connections between the z/VM manageability access point and:

- The z/VM TCP/IP stack. Usually the stack runs in the TCPIP service machine.
- The IBM Director Server

Both connections, and any other connections you want to set up for the z/VM manageability access point must use the same interface.

Restriction: If you are using z/VM 5.1, you can use only a single network interface for the z/VM manageability access point.

There are numerous options for setting up these connections. For a comprehensive discussion of all possibilities see *z/VM Connectivity*, SC24-6080, for details.

On the Linux instance that runs on the z/VM manageability access point, ensure that the host name is resolvable. You can make the host name resolvable by ensuring that there is a corresponding DNS entry or an entry in /etc/hosts.

Installing IBM Director

This topic provides procedures for installing IBM Director Server, IBM Director Console, Level 1: IBM Director Core Services, Level 2: IBM Director Agent, and IBM Director extensions.

Installing IBM Director Server

This topic provides information about installing IBM Director Server.

Important:

- IBM Director Server and IBM Director Console must be at the same release level. If you install IBM Director Server, version 5.10 on the management server, you must also install IBM Director Console, version 5.10 on any systems that you want to access the management server. In addition, 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.
- If you are planning to install and use a database for IBM Director other than the default database, make sure that you have installed and configured the database application that you will use with IBM Director before installing IBM Director Server. The default databases are DB2 on i5/OS and Apache Derby on all other operating systems.

Installing IBM Director Server on AIX

This topic describes how to install IBM Director Server on AIX.

When you install IBM Director Server, IBM Director Console and IBM Director Agent are installed automatically. During the installation process, you can install several IBM Director Agent features. You also can configure a database to use with IBM Director and change security settings.

Optional: If you choose to use a database application other than Apache Derby with IBM Director, be sure to perform any necessary preparation steps before configuring IBM Director to use the database. For more information, see "Preparing the IBM Director database" on page 153.

Complete the following steps to install IBM Director Server on AIX:

1. Insert the *IBM Director 5.10 for AIX 5L* CD into the drive.
2. To mount the drive, type the following command and press **Enter**:

   ```
   mount -v cdrfs -o ro /dev/cd0 /mnt
   ```

   where *dev/cd0* is the specific device file for the block device and *mnt* is the mount point of the drive.

3. To change to the directory where IBM Director Server is located, type the following command and press **Enter**:

   ```
   cd /mnt/director/server/aix
   ```

   where *mnt* is the mount point of the drive.
4. If you want to customize the installation, go to step 5. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   By default, the Apache Derby database application is installed and configured to work with IBM Director.

   Go to step 13 on page 186.
5. To customize the installation, copy the response file (dirserv.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp dirserv.rsp /directory
   ```

   where *directory* is the local directory.
6. Open an ASCII text editor and modify the installation settings in the dirserv.rsp file. This file is fully commented.

   You can specify the location of the .bff files, select the IBM Director extensions and features that you want to install, configure a database to use with IBM Director, and select log file options.
7. Save the modified response file with a new file name.
8. To install IBM Director Server using the response file, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 7.
9. The selections you made in the response file determine what you do next:

Settings	Result and next steps
DbmsConfigMethod parameter set to GUI; running AIX in a graphical environment.	The "IBM Director database configuration" window opens. Go to step 10 on page 184. **Note:** If you set the `DbmsConfigMethod` parameter to `GUI` but are not running AIX in a graphical environment, you must perform the database configuration after the installation of IBM Director Server is complete. See "Configuring the database on Linux or AIX" on page 330.
DbmsConfigMethod parameter set to Rspfile; database configuration information provided.	The database is configured silently during the installation. Go to step 13 on page 186.
DbmsConfigMethod parameter set to Rspfile; DbmsApplication parameter set to noDatabase.	No database configuration is performed during the installation. Go to step 12 on page 185.
DbmsConfigMethod parameter set to None.	No database configuration is performed during the installation. Go to step 12 on page 185.

10. Select the database application to use with IBM Director. You have the following options:

    Apache Derby
    (Option on all platforms except i5/OS) Creates and configures an embedded Apache Derby database. The Apache Derby application is included in the IBM Director installation.

    IBM DB2 Universal Database
    Configures IBM Director to use a DB2 database. IBM DB2 Universal Database must be installed and configured on a system in your network.

    Oracle Configures IBM Director to use an Oracle database. Oracle Server must be installed and configured on a system in your network.

    Select later (database disabled)
    IBM Director will be installed without a database. Tasks requiring a database will be absent or not functional.

    Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of functionality.

11. Click **Next** to configure IBM Director for use with your database application.

Table 111. Database configuration

If the database application is	Complete the applicable steps
Apache Derby	The ″IBM Director Apache Derby configuration″ window opens. The values cannot be changed. Click **Next** and go to step 13 on page 186.
IBM DB2 Universal Database	The “IBM Director DB2 Universal Database configuration” window opens. Complete the following fields: 1. In the **DB2 TCP/IP listener port** field, type the number of the port that is used by the DB2 TCP/IP listener. 2. In the **Server name** field, type the name of the server where DB2 is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid DB2 user ID. 5. In the **Password** field, type the password for the DB2 user ID. Click **Next** and go to step 13 on page 186.

Table 111. Database configuration (continued)

If the database application is	Complete the applicable steps
Oracle Server	The “IBM Director Oracle database configuration” window opens. Complete the following fields: 1. In the **Oracle TCP/IP listener port** field, type the number of the port that is used by the Oracle TCP/IP listener. 2. In the **Oracle host name** field, type the TCP/IP host name of the database server. 3. In the **Oracle System Identifier (SID)** field, type the Oracle system identifier (SID). 4. In the **User ID** field, type a valid Oracle user ID. If it does not exist, it is created. By default, this user ID is assigned to the IBM Director table space. 5. In the **Password** and **Confirm password** fields, type the password that is associated with the user ID that you typed in step 4. 6. In the **Oracle administrator account** field, type a valid user ID for the Oracle administrator account. 7. In the **Oracle administrator password** field, type the password that is associated with the user ID that you typed in step 6. Click **Next**. A second “IBM Director Oracle database configuration” window opens. Complete the following fields: 1. In the **Default tablespace name** field, type a table space name. 2. In the **Default tablespace data file** field, type the name of the table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 3. In the **Default tablespace size (MB)** field, type the size of the table space in MB. 4. In the **Temporary tablespace name** field, type a name for the temporary table space. 5. In the **Temporary tablespace data file** field, type the name of the temporary table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 6. In the **Temporary tablespace size (MB)** field, type the size of the temporary table space in MB. Click **Next** and go to step 13 on page 186.
Select later (database disabled)	IBM Director is installed without a database configured. To configure a database after the installation of IBM Director Server, see “Configuring the database on Linux or AIX” on page 330. Go to step 13 on page 186.

12. **Optional:** Configure IBM Director for use with a database application. For more information, see “Configuring the database on Linux or AIX” on page 330.

Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of function.

13. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/cfgsecurity
    ```
14. To start IBM Director Server, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/twgstart
    ```
15. To unmount the drive, type the following command and press **Enter**:

    ```
    umount /mnt
    ```

    where *mnt* is the mount point of the drive.
16. Remove the *IBM Director 5.10 for AIX 5L* CD from the drive.

Installing IBM Director Server using the Virtualization Engine installation wizard

Use the Systems Edition IBM Virtualization Engine installation wizard to install IBM Director and allow it to be integrated in a Virtualization Engine environment.

IBM Director for i5/OS is installed as part of Virtualization Engine Systems Edition for iSeries. Before you begin installing IBM Director Server, make sure that you have completed the planning for the installation, and that the server meets the requirements to install IBM Director. You also must have completed the "Preparing to install IBM Director on an iSeries server" on page 158 requirements.

Note: If you want to install Virtualization Engine console when you install IBM Director, refer to Systems Edition for iSeries for installation instructions.

To install IBM Director Server, complete the following steps:

1. Insert the installation CD or DVD into the CD or DVD device on a Windows system that has a network connection to the iSeries system where you plan to install IBM Director Server. The installation wizard will start automatically.
2. On the i5/OS Sign-On page, specify the following information:
   a. In the **Server Name** field, type the fully qualified server name on which you want to install IBM Director Server.
   b. In the **User ID** field, type the user ID to sign on to the system where you are installing IBM Director Server.
   c. In the **Password** field, type the password associated with the user ID.
3. On the Welcome page, click **Next**.
4. On the License Agreements page, select and read the software license agreements. If you agree with the terms, select **I accept the terms of the license agreements** and click **Next**. Otherwise, you will need to cancel the installation.
5. On the Temporary Directory page, the default directory is displayed to indicate where the installation files are copied. To select a different location for storing log files, click **Browse**.

6. On the Log File Destination page, the default path for the log-file destination is displayed. The default path is /QIBM/UserData/VE2/Logs. You cannot edit the destination directory for the log files.
7. On the Service Selection page, select **IBM Director Server**. It is recommended that you also select to copy the installation images for IBM Director Agent and IBM Director Console. The installation images that are selected to install are copied to the /QIBM/ProdData/VE2/ManagedNodes/ directory. Click **Next**.
8. On the Media Copy page, click **Load Next Volume** to copy the required installation files from the CD-ROM on your Windows workstation to the iSeries system to which your computer is attached. When all of the volumes are copied, click **Next**.
9. A Please Wait page opens to indicate that the installation files are being unpacked.
10. The Selection Summary page opens to indicate the services that are selected for installation. If you need to make changes, click **Back**. To continue with the installation, click **Install**.
11. A page opens to indicate the installation progress for IBM Director Server.
12. On the Server Start Preference page, select either **Start IBM Director** or **Do not start IBM Director** to indicate whether you want to start IBM Director Server when the installation is complete. If you select **Do not start IBM Director**, you can start IBM Director Server later with the twgstart command. See the *IBM Director Systems Management Guide* for more information.
13. On the Readme Files page, select **IBM Director** to view the readme file. When you are finished reviewing the readme, click **Next**.
14. A page opens that summarizes the results of the installation.

By default, encryption using Advanced Encryption Standard (AES) algorithm is enabled during installation. To change encryption settings, use **Encryption Administration** in IBM Director Console

Continue with steps to install IBM Director Agent and IBM Director Console on the other systems in your IBM Director environment. After you have installed the components of IBM Director, complete the required configuration steps.

Installing IBM Director Server on Linux for xSeries

This topic describes how to install IBM Director Server on a server running Linux for xSeries.

When you install IBM Director Server, IBM Director Console and IBM Director Agent are installed automatically. During the installation process, you can install several IBM Director Agent features. You also can configure a database to use with IBM Director and change security settings.

Optional: If you choose to use a database application other than Apache Derby with IBM Director, be sure to perform any necessary preparation steps before configuring IBM Director to use the database. For more information, see "Preparing the IBM Director database" on page 153.

To install IBM Director Server on Linux for xSeries, complete the following steps:

1. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
2. If the CD automounts, go to step 3 on page 188. If the CD does not automount, type the following command and press **Enter**:

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

where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.

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

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

   where *mnt/cdrom* is the mount point of the drive.
4. If you want to customize the installation, go to step 5. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   Refer to the response file to find out what the defaults are. The response file is called dirserv.rsp and located in the same directory as the installation script. In the response file, “1” indicates that an item is to be installed and “0” indicates that an item is not to be installed.

   If you are running Linux in a graphical environment, go to step 11 on page 189.

   If you are not running Linux in a graphical environment, go to step 13 on page 192.
5. To customize the installation, copy the response file (dirserv.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp dirserv.rsp /directory
   ```

   where *directory* is the local directory to which you copied the response file.
6. Open an ASCII text editor and modify the installation settings in the direserv.rsp file. This file is fully commented.

   You can specify the location of the RPM files, select the IBM Director extensions and features that you want to install, configure a database to use with IBM Director, and select log file options.
7. Save the modified response file with a new file name.
8. To install IBM Director Server using the response file, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file and *response.rsp* is the name of the response file as saved in step 7.
9. **Optional:** Keep the response file for future use and reference.
10. The selections you made in the response file determine what you do next:

Settings	Result and next steps
DbmsConfigMethod parameter set to GUI; running Linux in a graphical environment.	The ″IBM Director database configuration″ window opens. Go to step 11 on page 189. **Note:** If you set the `DbmsConfigMethod` parameter to `GUI` but are not running Linux in a graphical environment, you must perform the database configuration after the installation of IBM Director Server is complete. See “Configuring the database on Linux or AIX” on page 330.

Settings	Result and next steps
DbmsConfigMethod parameter set to Rspfile; database configuration information provided.	The database is configured silently during the installation. Go to step 14 on page 192.
DbmsConfigMethod parameter set to Rspfile; DbmsApplication parameter set to noDatabase.	No database configuration is performed during the installation. Go to step 13 on page 192.
DbmsConfigMethod parameter set to None.	No database configuration is performed during the installation. Go to step 13 on page 192.

11. Select the database application to use with IBM Director. You have the following options:

    Apache Derby
    (Option on all platforms except i5/OS) Creates and configures an embedded Apache Derby database. The Apache Derby application is included in the IBM Director installation.

    IBM DB2 Universal Database
    Configures IBM Director to use a DB2 database. IBM DB2 Universal Database must be installed and configured on a system in your network.

    Microsoft Data Engine (MSDE) 2000 or Microsoft SQL Server 2000
    Configures IBM Director to use an MSDE or Microsoft SQL Server database. MSDE or Microsoft SQL Server must be installed and configured on a system in your network.

    Oracle Configures IBM Director to use an Oracle database. Oracle Server must be installed and configured on a system in your network.

    PostgreSQL
    Configures IBM Director to use a PostgreSQL database. PostgreSQL must be installed and configured on a system in your network

    Select later (database disabled)
    IBM Director will be installed without a database. Tasks requiring a database will be absent or not functional.

    Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of functionality.

12. Click **Next** to configure IBM Director for use with your database application.

Table 112. Database configuration

If the database application is	Complete the applicable steps
Apache Derby	The ″IBM Director Apache Derby configuration″ window opens. The values cannot be changed. Click **Next** and go to step 14 on page 192.

Table 112. Database configuration (continued)

If the database application is	Complete the applicable steps
IBM DB2 Universal Database	The "IBM Director DB2 Universal Database configuration" window opens. Complete the following fields: 1. In the **DB2 TCP/IP listener port** field, type the number of the port that is used by the DB2 TCP/IP listener. 2. In the **Server name** field, type the name of the server where DB2 is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid DB2 user ID. 5. In the **Password** field, type the password for the DB2 user ID. Click **Next** and go to step 14 on page 192.
MSDE or Microsoft SQL Server	The "IBM Director Microsoft SQL Server database configuration" window opens. Complete the following fields: 1. In the **SQL Server TCP/IP listener port** field, type the number of the port that is used by the SQL Server TCP/IP listener. 2. In the **Server name** field, type the name of the server on which SQL Server is installed. 3. In the **Database name** field, type the name of the database. If it does not exist, it will be created. 4. In the **User ID** field, type a valid user ID for the SQL Server. 5. In the **Password** field, type the password for the SQL Server user ID. Click **Next** and go to step 14 on page 192.

Table 112. Database configuration (continued)

If the database application is	Complete the applicable steps
Oracle Server	The “IBM Director Oracle database configuration” window opens. Complete the following fields: 1. In the **Oracle TCP/IP listener port** field, type the number of the port that is used by the Oracle TCP/IP listener. 2. In the **Oracle host name** field, type the TCP/IP host name of the database server. 3. In the **Oracle System Identifier (SID)** field, type the Oracle system identifier (SID). 4. In the **User ID** field, type a valid Oracle user ID. If it does not exist, it is created. By default, this user ID is assigned to the IBM Director table space. 5. In the **Password** and **Confirm password** fields, type the password that is associated with the user ID that you typed in step 4. 6. In the **Oracle administrator account** field, type a valid user ID for the Oracle administrator account. 7. In the **Oracle administrator password** field, type the password that is associated with the user ID that you typed in step 6. Click **Next**. A second “IBM Director Oracle database configuration” window opens. Complete the following fields: 1. In the **Default tablespace name** field, type a table space name. 2. In the **Default tablespace data file** field, type the name of the table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 3. In the **Default tablespace size (MB)** field, type the size of the table space in MB. 4. In the **Temporary tablespace name** field, type a name for the temporary table space. 5. In the **Temporary tablespace data file** field, type the name of the temporary table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 6. In the **Temporary tablespace size (MB)** field, type the size of the temporary table space in MB. Click **Next** and go to step 14 on page 192.

Table 112. Database configuration (continued)

If the database application is	Complete the applicable steps
PostgreSQL	The "IBM Director PostgreSQL database configuration" window opens. Complete the following fields: 1. In the **PostgreSQL TCP/IP listener port** field, type the number of the port that is used by the PostgreSQL TCP/IP listener. 2. In the **Server name** field, type the name of the server where PostgreSQL is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid PostgreSQL user ID. 5. In the **Password** field, type the password for the PostgreSQL user ID. Click **Next** and go to step 14.
Select later (database disabled)	IBM Director is installed without a database configured. To configure a database after the installation of IBM Director Server, see "Configuring the database on Linux or AIX" on page 330. Go to step 14.

13. **Optional:** Configure IBM Director for use with a database application. For more information, see "Configuring the database on Linux or AIX" on page 330.

    Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of function.
14. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/cfgsecurity
    ```
15. To start IBM Director, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/twgstart
    ```
16. To unmount the drive, complete the following steps:
    a. Type `cd /` and press **Enter**.
    b. Type the following command and press **Enter**:

    ```
    umount /mnt/cdrom
    ```

    where *mnt/cdrom* is the mount point of the drive.
17. Remove the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD from the drive.

Related tasks

"Selecting the IBM Director database application" on page 145
The topic describes how to select the database application to use with IBM Director Server.

"Preparing the IBM Director database" on page 153
This topic describes how to prepare the SQL database that IBM Director uses to store inventory data.

"Configuring the database on a Linux or AIX management server using the cfgdb command" on page 330
This topic describes how to configure the database after IBM Director Server is installed using the cfgdb command.

"Configuring the database on a Linux or AIX management server using the cfgdbcmd command" on page 331
This topic describes how to configure the database from a command line after IBM Director Server is installed.

Related reference

"Supported database applications" on page 137
This topic provides information about the database applications that are supported for use with IBM Director. IBM Director Server uses an SQL database to store inventory data for the systems in the environment.

Installing IBM Director Server on Linux for System z9 and zSeries

This topic describes how to install IBM Director Server on a server running Linux for System z9 and zSeries.

When you install IBM Director Server, IBM Director Console and IBM Director Agent are installed automatically. During the installation process, you can install several IBM Director Server and Agent features.

Note: The workstation being used for the installation must have an X-Windows server or Virtual Network Computing (VNC) client.

Optional: If you choose to use a database application other than Apache Derby with IBM Director, be sure to perform any necessary preparation steps before configuring IBM Director to use the database. For more information, see "Preparing the IBM Director database" on page 153.

Complete the following steps to install IBM Director Server on Linux for System z9 and zSeries:

1. Make the installation code from the *IBM Director 5.10 for Linux on System z9 and zSeries* CD available to your Linux system. See "Preparing to install IBM Director on a System z9 or zSeries server" on page 166 for more information.
2. Change to the directory where the installation script is located. Type the following command and press **Enter**:

   ```
   cd /mnt/director/server/linux/s390/
   ```

   where */mnt* is the mount point of the file system on the CD or the location of the IBM Director installation files.
3. If you want to customize the installation go to step 4 on page 194. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   Refer to the response file to view the default. The response file is named dirserv.rsp and located in the same directory as the installation script. In the response file, "1" indicates that an item is to be installed and "0" indicates that an item is not to be installed.

Go to step 10.

4. To customize the installation, copy the response file to a local directory. Type the following command and press **Enter**:

   ```
   cp dirserv.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the dirserv.rsp file. This file is fully commented.

   You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Server using the response file, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file and *response.rsp* is the name of the response file as saved in step 6.
8. **Optional:** Keep the response file for future use and reference.
9. The selections you made in the response file determine what you do next:

Settings	Result and next steps
DbmsConfigMethod parameter set to GUI.	The ″IBM Director database configuration″ window opens. Go to step 10.
DbmsConfigMethod parameter set to Rspfile; database configuration information provided.	The database is configured silently during the installation. Go to step 12 on page 197.
DbmsConfigMethod parameter set to Rspfile; DbmsApplication parameter set to noDatabase.	No database configuration is performed during the installation. Go to step 11 on page 197.
DbmsConfigMethod parameter set to None.	No database configuration is performed during the installation. Go to step 11 on page 197.

10. Select the database application to use with IBM Director. You have the following options:

    Apache Derby
    (Option on all platforms except i5/OS) Creates and configures an embedded Apache Derby database. The Apache Derby application is included in the IBM Director installation.

    IBM DB2 Universal Database
    Configures IBM Director to use a DB2 database. IBM DB2 Universal Database must be installed and configured on a system in your network.

    Microsoft Data Engine (MSDE) 2000 or Microsoft SQL Server 2000
    Configures IBM Director to use an MSDE or Microsoft SQL Server database. MSDE or Microsoft SQL Server must be installed and configured on a system in your network.

    Oracle
    Configures IBM Director to use an Oracle database. Oracle Server must be installed and configured on a system in your network.

    PostgreSQL
    Configures IBM Director to use a PostgreSQL database. PostgreSQL must be installed and configured on a system in your network

Select later (database disabled)
IBM Director will be installed without a database. Tasks requiring a database will be absent or not functional.

Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of functionality.

Click **Next** to configure the IBM Director database.

Table 113. Database configuration

If the database application is	Do
Apache Derby	The ″IBM Director Apache Derby configuration″ window opens. The values cannot be changed. Click **Next** and go to step 12 on page 197.
IBM DB2 Universal Database	The “IBM Director DB2 Universal Database configuration” window opens. Type information in the following entry fields: 1. In the **DB2 TCP/IP listener port** field, type the number of the port that is used by the DB2 TCP/IP listener. 2. In the **Server name** field, type the name of the server where DB2 is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid DB2 user ID. 5. In the **Password** field, type the password for the DB2 user ID. Click **Next** and go to step 12 on page 197.
MSDE or Microsoft SQL Server	The “IBM Director Microsoft SQL Server database configuration” window opens. Type information in the following entry fields: 1. In the **SQL Server TCP/IP listener port** field, type the number of the port that is used by the SQL Server TCP/IP listener. 2. In the **Server name** field, type the name of the server where SQL Server is installed. 3. In the **Database name** field, type name of the database. If it does not exist, it will be created. 4. In the **User ID** field, type a valid SQL Server user ID. 5. In the **Password** field, type the password for the SQL Server user ID. Click **Next** and go to step 12 on page 197.

Table 113. Database configuration (continued)

If the database application is	Do
Oracle Server	The “IBM Director Oracle database configuration” window opens. Type information in the following entry fields: 1. In the **Oracle TCP/IP listener port** field, type the number of the port that is used by the Oracle TCP/IP listener. 2. In the **Oracle host name** field, type the TCP/IP host name of the database server. 3. In the **Oracle System Identifier (SID)** field, type the Oracle system identifier (SID). 4. In the **User ID** field, type a valid Oracle user ID. If it does not exist, it is created. By default, this user ID is assigned to the IBM Director table space. 5. In the **Password** and **Confirm password** fields, type the password that is associated with the user ID that you typed in step 4. 6. In the **Oracle administrator account** field, type a valid Oracle administrator account user ID. 7. In the **Oracle administrator password** field, type the password that is associated with the user ID that you typed in step 6. Click **Next**. A second “IBM Director Oracle database configuration” window opens. Type information in the following entry fields: 1. In the **Default tablespace name** field, type a table space name. 2. In the **Default tablespace data file** field, type the name of the table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 3. In the **Default tablespace size (MB)** field, type the size of the table space in MB. 4. In the **Temporary tablespace name** field, type a name for the temporary table space. 5. In the **Temporary tablespace data file** field, type the name of the temporary table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 6. In the **Temporary tablespace size (MB)** field, type the size of the temporary table space in MB. Click **Next** and go to step 12 on page 197.

Table 113. Database configuration (continued)

If the database application is	Do
PostgreSQL	The "IBM Director PostgreSQL database configuration" window opens. Complete the following fields: 1. In the **PostgreSQL TCP/IP listener port** field, type the number of the port that is used by the PostgreSQL TCP/IP listener. 2. In the **Server name** field, type the name of the server where PostgreSQL is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid PostgreSQL user ID. 5. In the **Password** field, type the password for the PostgreSQL user ID. Click **Next** and go to step 12.
Select later (database disabled)	IBM Director is installed without a database configured. To configure a database after the installation of IBM Director Server, see "Configuring the database on Linux or AIX" on page 330. Go to step 12.

11. **Optional:** Configure IBM Director for use with a database application. For more information, see "Configuring the database on Linux or AIX" on page 330.

    Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of function.
12. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:
    ```
    /opt/ibm/director/bin/cfgsecurity
    ```
13. To start IBM Director, type the following command and press **Enter**:
    ```
    /opt/ibm/director/bin/twgstart
    ```

To enable SNMP Access and Trap Forwarding, install and configure Net-SNMP, version 5.2.1. See "Enabling SNMP access and trap forwarding for Linux" on page 331.

For instructions for installing IBM Director Software Distribution (Premium Edition) see "Installing Software Distribution on Linux" on page 281.

Related tasks

"Selecting the IBM Director database application" on page 145
The topic describes how to select the database application to use with IBM Director Server.

"Preparing the IBM Director database" on page 153
This topic describes how to prepare the SQL database that IBM Director uses to store inventory data.

"Configuring the database on a Linux or AIX management server using the cfgdb command" on page 330
This topic describes how to configure the database after IBM Director Server is installed using the cfgdb command.

"Configuring the database on a Linux or AIX management server using the cfgdbcmd command" on page 331
This topic describes how to configure the database from a command line after IBM Director Server is installed.

Related reference

"Supported database applications" on page 137
This topic provides information about the database applications that are supported for use with IBM Director. IBM Director Server uses an SQL database to store inventory data for the systems in the environment.

Installing IBM Director Server on Linux for POWER

This topic describes how to install IBM Director Server on a server running Linux for POWER.

When you install IBM Director Server, IBM Director Console and IBM Director Agent are installed automatically. During the installation process, you can install several IBM Director Agent features.

Optional: If you choose to use a database application other than Apache Derby with IBM Director, be sure to perform any necessary preparation steps before configuring IBM Director to use the database. For more information, see "Preparing the IBM Director database" on page 153.

Complete the following steps to install IBM Director Server on Linux for POWER:

1. Insert the *IBM Director 5.10 for Linux on POWER* CD into the drive.
2. If the CD automounts, go to step 3. If the CD does not automount, type the following command and press **Enter**:

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

   where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.
3. Change to the directory where the installation script is located. Type the following command and press **Enter**:

   ```
   cd /mnt/cdrom/director/server/linux/ppc/
   ```

   where *mnt/cdrom* is the mount point of the drive.
4. If you want to customize the installation, go to step 5. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   By default, the Apache Derby database application is installed and configured to work with IBM Director.

   Go to step 13 on page 202.
5. To customize the installation, copy the response file (dirserv.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp dirserv.rsp /directory
   ```

   where *directory* is the local directory.

6. Open an ASCII text editor and modify the installation settings in the dirserv.rsp file. This file is fully commented.

   You can specify the location of the RPM files, select the IBM Director extensions and features that you want to install, configure a database to use with IBM Director, and select log file options.
7. Save the modified response file with a new file name.
8. To install IBM Director Server using the response file, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 7.
9. The selections you made in the response file determine what you do next:

Settings	Result and next steps
DbmsConfigMethod parameter set to GUI; running Linux in a graphical environment.	The "IBM Director database configuration" window opens. Go to step 10. **Note:** If you set the `DbmsConfigMethod` parameter to `GUI` but are not running Linux in a graphical environment, you must perform the database configuration after the installation of IBM Director Server is complete. See "Configuring the database on Linux or AIX" on page 330.
DbmsConfigMethod parameter set to Rspfile; database configuration information provided.	The database is configured silently during the installation. Go to step 13 on page 202.
DbmsConfigMethod parameter set to Rspfile; DbmsApplication parameter set to noDatabase.	No database configuration is performed during the installation. Go to step 12 on page 201.
DbmsConfigMethod parameter set to None.	No database configuration is performed during the installation. Go to step 12 on page 201.

10. Select the database application to use with IBM Director. You have the following options:

    Apache Derby
    (Option on all platforms except i5/OS) Creates and configures an embedded Apache Derby database. The Apache Derby application is included in the IBM Director installation.

    IBM DB2 Universal Database
    Configures IBM Director to use a DB2 database. IBM DB2 Universal Database must be installed and configured on a system in your network.

    Oracle Configures IBM Director to use an Oracle database. Oracle Server must be installed and configured on a system in your network.

    Select later (database disabled)
    IBM Director will be installed without a database. Tasks requiring a database will be absent or not functional.

    Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of functionality.

11. Click **Next** to configure IBM Director for use with your database application.

Table 114. Database configuration

If the database application is	Complete the applicable steps
Apache Derby	The ″IBM Director Apache Derby configuration″ window opens. The values cannot be changed. Click **Next** and go to step 13 on page 202.
IBM DB2 Universal Database	The “IBM Director DB2 Universal Database configuration” window opens. Complete the following fields: 1. In the **DB2 TCP/IP listener port** field, type the number of the port that is used by the DB2 TCP/IP listener. 2. In the **Server name** field, type the name of the server where DB2 is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid DB2 user ID. 5. In the **Password** field, type the password for the DB2 user ID. Click **Next** and go to step 13 on page 202.

Table 114. Database configuration (continued)

If the database application is	Complete the applicable steps
Oracle Server	The "IBM Director Oracle database configuration" window opens. Complete the following fields: 1. In the **Oracle TCP/IP listener port** field, type the number of the port that is used by the Oracle TCP/IP listener. 2. In the **Oracle host name** field, type the TCP/IP host name of the database server. 3. In the **Oracle System Identifier (SID)** field, type the Oracle system identifier (SID). 4. In the **User ID** field, type a valid Oracle user ID. If it does not exist, it is created. By default, this user ID is assigned to the IBM Director table space. 5. In the **Password** and **Confirm password** fields, type the password that is associated with the user ID that you typed in step 4. 6. In the **Oracle administrator account** field, type a valid user ID for the Oracle administrator account. 7. In the **Oracle administrator password** field, type the password that is associated with the user ID that you typed in step 6. Click **Next**. A second "IBM Director Oracle database configuration" window opens. Complete the following fields: 1. In the **Default tablespace name** field, type a table space name. 2. In the **Default tablespace data file** field, type the name of the table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 3. In the **Default tablespace size (MB)** field, type the size of the table space in MB. 4. In the **Temporary tablespace name** field, type a name for the temporary table space. 5. In the **Temporary tablespace data file** field, type the name of the temporary table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 6. In the **Temporary tablespace size (MB)** field, type the size of the temporary table space in MB. Click **Next** and go to step 13 on page 202.
Select later (database disabled)	IBM Director is installed without a database configured. To configure a database after the installation of IBM Director Server, see "Configuring the database on Linux or AIX" on page 330. Go to step 13 on page 202.

12. **Optional:** Configure IBM Director for use with a database application. For more information, see "Configuring the database on Linux or AIX" on page 330.

Important: You can configure IBM Director for use with your database application at any point after the installation of IBM Director Server, but you must not start the management server until it is completed. Starting the management server before configuring IBM Director to use a database application might result in a loss of function.

13. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/cfgsecurity
    ```
14. To start IBM Director, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/twgstart
    ```
15. To unmount the drive, complete the following steps:
    1. Type `cd /` and press **Enter**.
    2. Type the following command and press **Enter**:

       ```
       umount /mnt/cdrom
       ```

       where *mnt/cdrom* is the mount point of the drive.
16. Remove the *IBM Director 5.10 for Linux on POWER* CD from the drive.

To configure your database application for use with IBM Director, see "Configuring the database on a Linux or AIX management server using the cfgdb command" on page 330 or "Configuring the database on a Linux or AIX management server using the cfgdbcmd command" on page 331.

To enable SNMP Access and Trap Forwarding, install and configure Net-SNMP, version 5.2.1, see "Enabling SNMP access and trap forwarding for Linux" on page 331.

Installing IBM Director Server on Windows

This section describes how to install IBM Director Server on a system that is running Windows.

When you install IBM Director Server, the InstallShield wizard also automatically installs IBM Director Console and IBM Director Agent. During the installation process, you can install the optional IBM Director features. You also can change security settings.

This section provides instructions for installing IBM Director Server using the InstallShield wizard. The wizard can be used in a standard interactive mode, or you can perform an unattended installation using a response file to provide answers to the questions that the wizard poses.

Note: If Microsoft Windows Installer (MSI), version 3.0 or later is not installed on the system, it is installed during the IBM Director Server installation. If the upgrade is necessary, the system prompts you to restart following the installation of IBM Director Server without specifying that Microsoft Windows Installer was installed. Unless you install using the response file and set the RebootIfRequired parameter to N, you are prompted to restart whether or not the IBM Director Server installation is completed successfully.

In addition, if you attempt to perform an administrative installation and MSI has not yet been upgraded, you must change to the directory containing the ibmsetup.exe file and run the installation program using the following command:

```
ibmsetup.exe admin
```

This command updates MSI and runs the installation program in administrative mode. Restart the system if prompted to do so.

Installing IBM Director Server on Windows using the InstallShield wizard:

This topic describes how to install IBM Director Server on a server running Windows using the InstallShield wizard.

Optional: If you choose to use a database application other than Apache Derby with IBM Director, be sure to perform any necessary preparation steps before configuring IBM Director to use the database. For more information, see "Preparing the IBM Director database" on page 153.

Complete the following steps to install IBM Director Server:

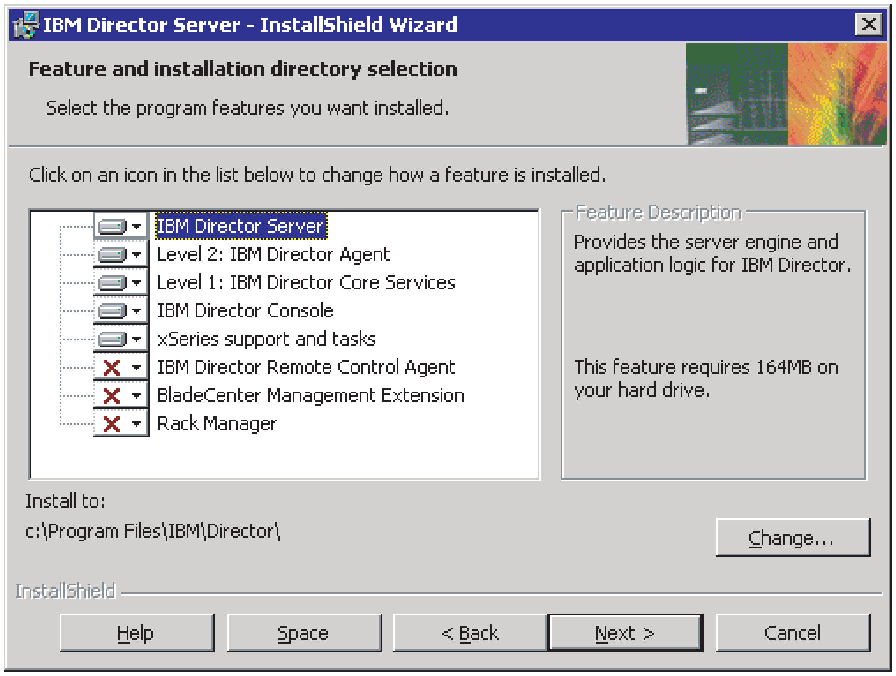
1. Using an account with either local or domain administrative privileges, log on to the operating system.
2. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
3. If the installation program starts automatically and the ″IBM Director Setup″ window opens, go to step 5. Otherwise, click **Start** → **Run**.
4. In the **Open** field, type the following command and press **Enter**:

   ```
   e:\setup.exe
   ```

   where *e* is the drive letter on your system. The installation program starts, and the ″IBM Director Setup″ window opens.
5. Click **Install IBM Director Server**. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard″ window opens.

   Accessibility note: Screen readers might not process the ″IBM Director Setup″ window correctly. To start the installation wizard for IBM Director Server using the keyboard, perform the following steps:

   a. Close the ″IBM Director Setup″ window.
   b. Open Windows Explorer.
   c. Browse to the director/server/windows/i386 directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   d. Execute the ibmsetup.exe program. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Server″ window opens. Continue to step 6.
6. Click **Next**. The ″License Agreement″ window opens.
7. Click **I accept the terms in the license agreement**; then, click **Next**. The "Feature and installation directory selection" window opens.



IBM Director Server - InstallShield Wizard

Feature and installation directory selection

Select the program features you want installed.

Click on an icon in the list below to change how a feature is installed.

- 🖴 IBM Director Server
- 🖴 Level 2: IBM Director Agent
- 🖴 Level 1: IBM Director Core Services
- 🖴 IBM Director Console
- 🖴 xSeries support and tasks
- X IBM Director Remote Control Agent
- X BladeCenter Management Extension
- X Rack Manager

Feature Description

Provides the server engine and application logic for IBM Director.

This feature requires 164MB on your hard drive.

Install to:

c:\Program Files\IBM\Director\

Figure 12. Installing IBM Director Server on Windows: “Feature and installation directory selection” window

IBM Director Server, Level 2: IBM Director Agent, Level 1: IBM Director Core Services, IBM Director Console, and xSeries Support and tasks are selected automatically for installation; a hard disk drive icon 🖴 is displayed to the left of each component. A red X X is displayed to the left of each optional feature that is not selected by default.

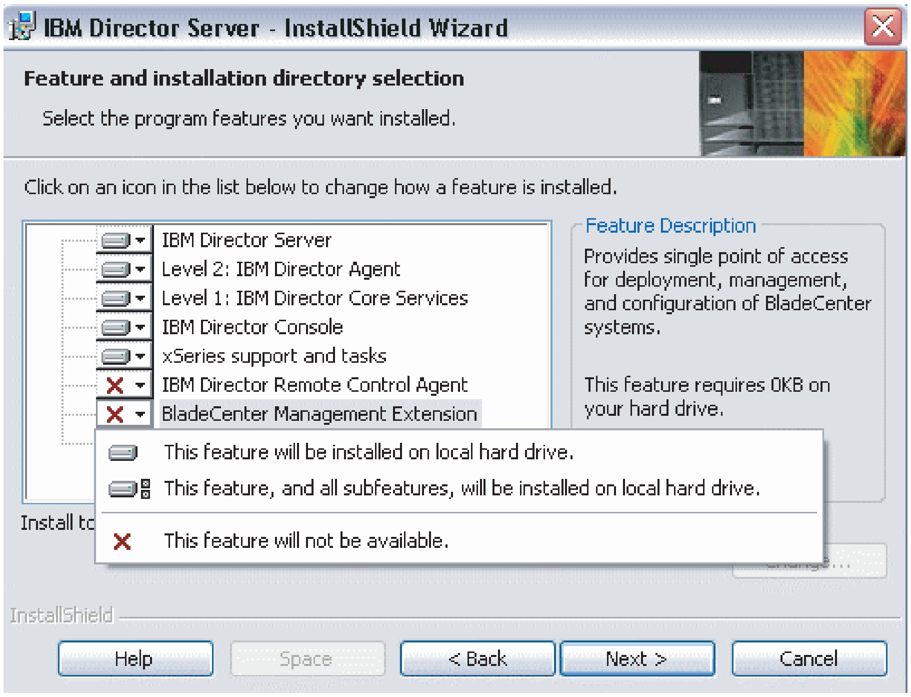
8. Select the IBM Director Agent features that you want to install:

   IBM Director Remote Control Agent
   Enables a system administrator to perform remote desktop functions on the management server.

   BladeCenter Management Extension
   Enables a system administrator to manage BladeCenter units.

   Rack Manager
   Enables a system administrator to use the Rack Manager task to build a realistic, visual representation of a rack and its components.

   To select a feature, click the red X to the left of the feature name. A menu opens. To select the feature, click either **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.



IBM Director Server - InstallShield Wizard

Feature and installation directory selection

Select the program features you want installed.

Click on an icon in the list below to change how a feature is installed.

- IBM Director Server
- Level 2: IBM Director Agent
- Level 1: IBM Director Core Services
- IBM Director Console
- xSeries support and tasks
- ✕ IBM Director Remote Control Agent
- ✕ BladeCenter Management Extension

Feature Description

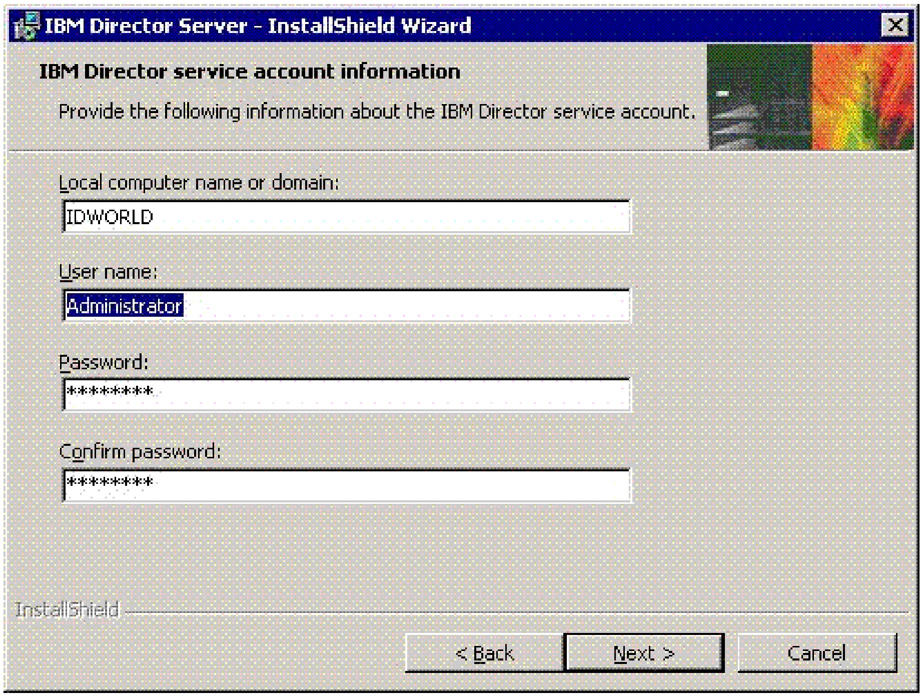
Provides single point of access for deployment, management, and configuration of BladeCenter systems.

This feature requires 0KB on your hard drive.

- This feature will be installed on local hard drive.
- This feature, and all subfeatures, will be installed on local hard drive.
- ✕ This feature will not be available.

Figure 13. Installing IBM Director Server on Windows: “Features and installation directory selection” window

9. Click **Next**. The “IBM Director service account information” window opens.



IBM Director Server - InstallShield Wizard

IBM Director service account information

Provide the following information about the IBM Director service account.

Local computer name or domain: IDWORLD

User name: Administrator

Password: ********

Confirm password: ********

Figure 14. Installing IBM Director Server on Windows: “IBM Director service account information” window

10. Provide information about the IBM Director service account:

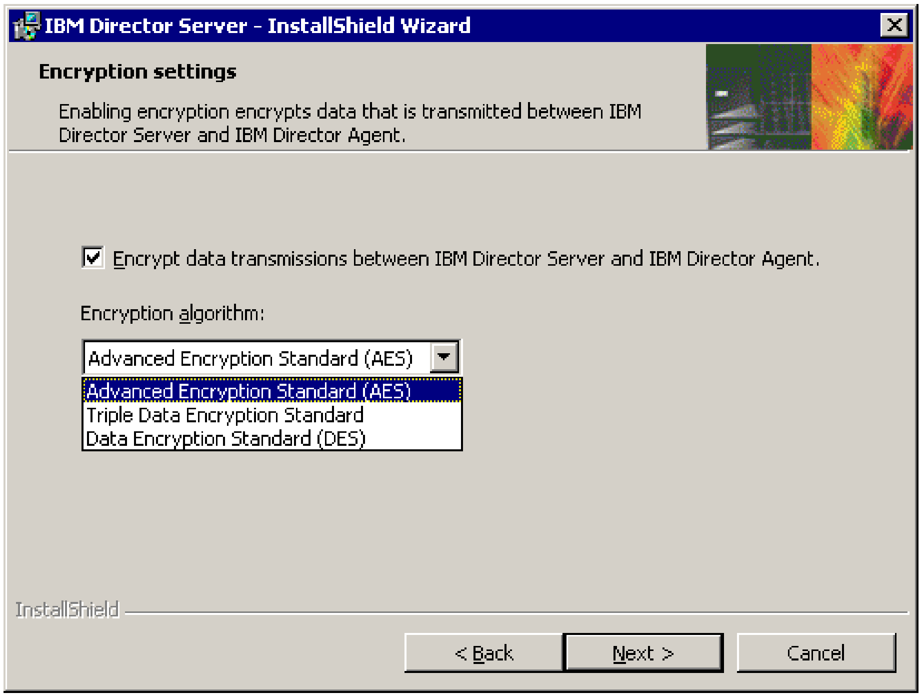
a. In the **Local computer name or domain** field, type the computer name of the IBM Director service account. If the service account is a domain account, type the domain.

b. In the **User name** field, type the user ID for the IBM Director service account.

c. In the **Password** and **Confirm password** fields, type the password for the IBM Director service account.

Note: The information must correspond to a Windows account with administrator privileges on the management server. Otherwise, the installation will fail.

11. Click **Next**. The “Encryption settings” window opens.



IBM Director Server - InstallShield Wizard

Encryption settings

Enabling encryption encrypts data that is transmitted between IBM Director Server and IBM Director Agent.

☑ Encrypt data transmissions between IBM Director Server and IBM Director Agent.

Encryption algorithm:

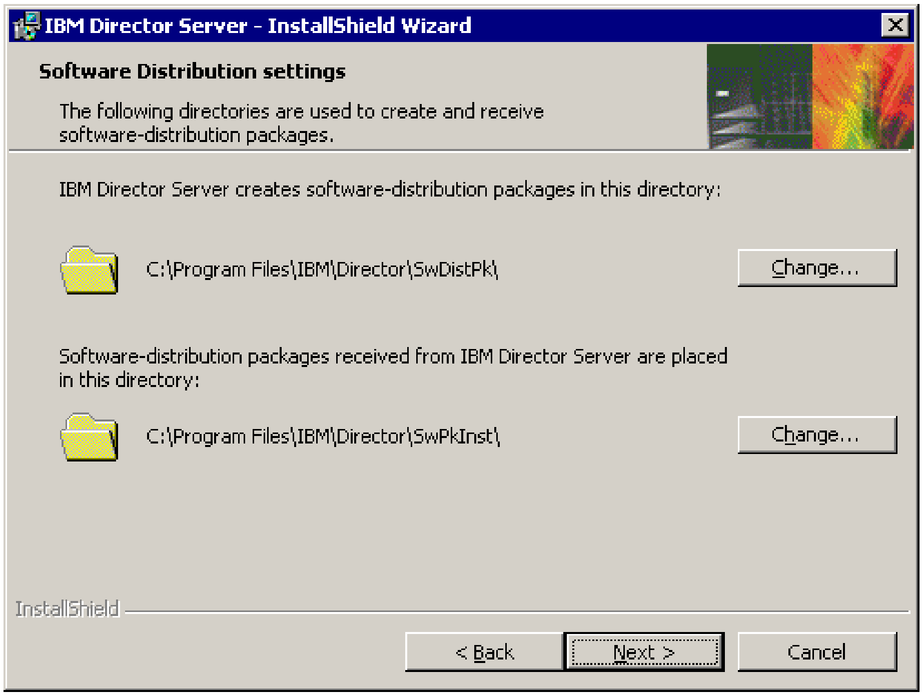
Advanced Encryption Standard (AES)

- Advanced Encryption Standard (AES)
- Triple Data Encryption Standard
- Data Encryption Standard (DES)

Figure 15. Installing IBM Director Server on Windows: “Encryption settings” window

12. By default, the **Encrypt data transmissions between IBM Director Server and IBM Director Agent** check box is selected and the Advanced Encryption Standard (AES) encryption algorithm is enabled. You can clear the check box to disable encryption or select a different encryption algorithm.

13. Click **Next**. The ″Software Distribution settings″ window opens.



IBM Director Server - InstallShield Wizard

Software Distribution settings

The following directories are used to create and receive software-distribution packages.

IBM Director Server creates software-distribution packages in this directory:

C:\Program Files\IBM\Director\SwDistPk\

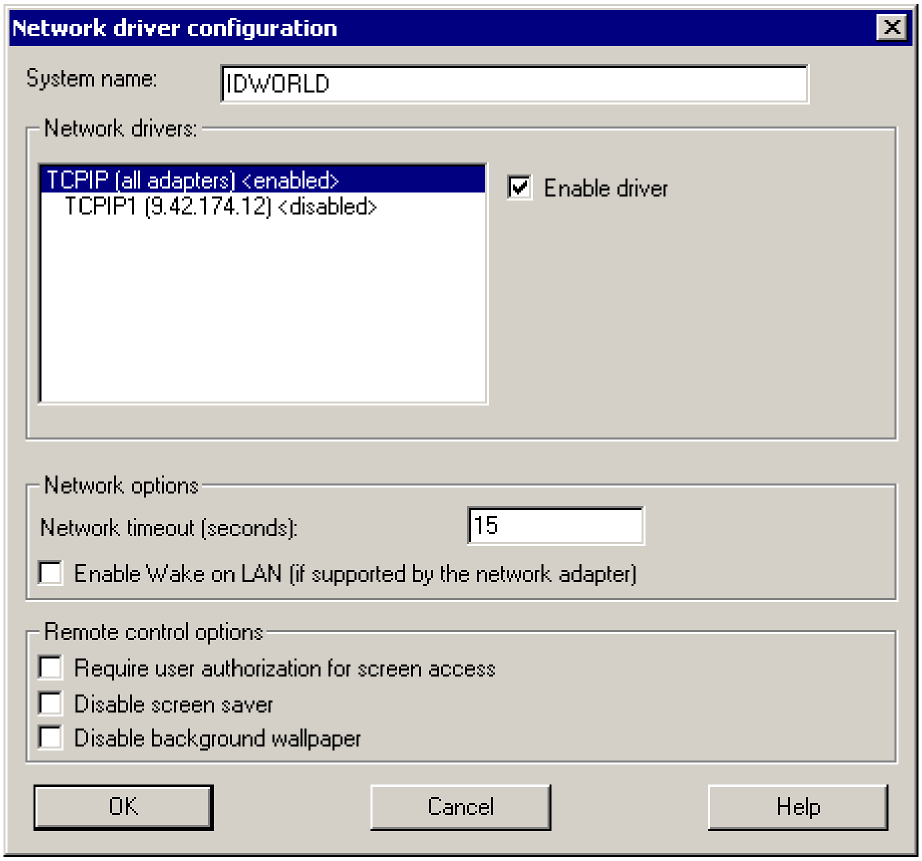
Software-distribution packages received from IBM Director Server are placed in this directory:

C:\Program Files\IBM\Director\SwPkInst\

Figure 16. Installing IBM Director Server on Windows: "Software Distribution settings" window

14. To select an alternative location for the creation of the software-distribution packages, click **Change** and select another directory.

    To select an alternative location for software-distribution packages that are received from IBM Director Server are placed, click **Change** and select another directory.
15. Click **Next**. The ″Ready to Install the Program″ window opens.
16. Click **Install**. The ″Installing IBM Director Server″ window opens. The progress of the installation is displayed in the **Status** field. When the installation is completed, the "Network driver configuration" window opens.



Network driver configuration

System name: IDWORLD

Network drivers:

TCPIP (all adapters) <enabled>
TCPIP1 (9.42.174.12) <disabled>

☑ Enable driver

Network options

Network timeout (seconds): 15

□ Enable Wake on LAN (if supported by the network adapter)

Remote control options

□ Require user authorization for screen access

□ Disable screen saver

□ Disable background wallpaper

Figure 17. Installing IBM Director Server on Windows: “Network driver configuration” window

17. In the **System name** field, type the name that you want to be displayed in IBM Director Console. By default, this is the NetBIOS name of the management server.
18. Define the communication protocols to use between IBM Director Server and IBM Director Agent.
    a. In the **Network drivers** field, the TCPIP (all adapters) setting is enabled by default. To enable another protocol, select the protocol and then select the **Enable driver** check box.

       Note: If you disable the TCPIP (all adapters) setting and enable an individual device driver on a system with multiple network adapters, IBM Director Server will receive *only* those data packets addressed to the individual adapter.
    b. In the **Network timeout** field, type the number of seconds that IBM Director Server waits for a response from IBM Director Agent. By default, this value is set to 15 seconds.
    c. Select the **Enable Wake on LAN** check box if the network adapter supports the Wake on LAN® feature.

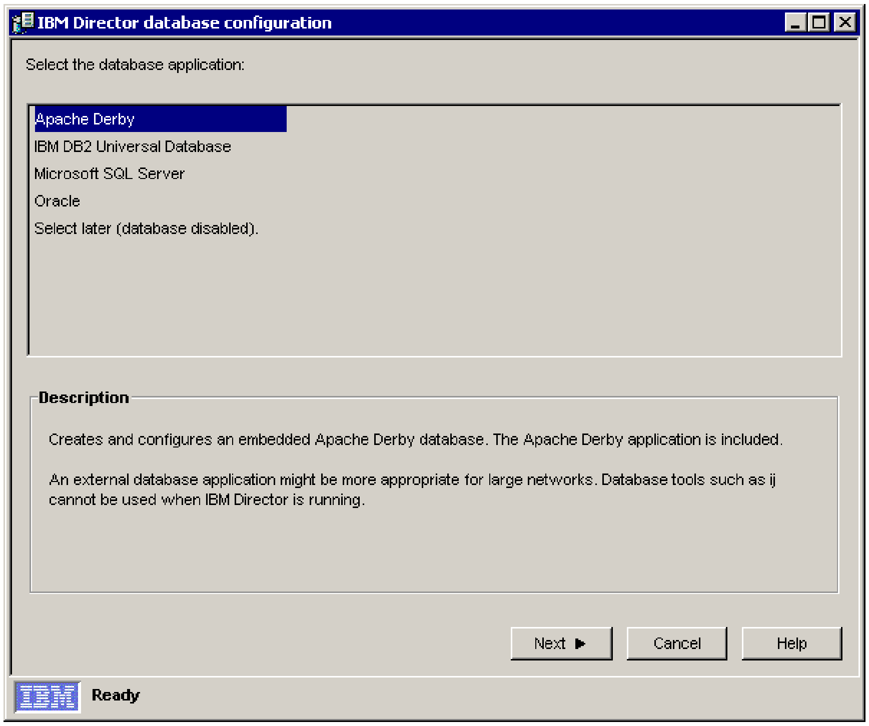
       Note: To determine whether your server supports the Wake on LAN feature, see your server documentation.
    d. If you chose to install the IBM Director Remote Control Agent, the following options are available:

Require user authorization for system access
Select this check box to request authorization from the local user before controlling the management server remotely.

Disable screen saver
Select this check box to disable the screen saver on the management server when it is controlled remotely.

Disable background wallpaper
Select this check box to disable desktop wallpaper on the management server when it is controlled remotely. You might want to disable the wallpaper because complicated backgrounds slow down remote control and increase network traffic.

19. Click **OK**. The "IBM Director database configuration" window opens.



Select the database application:

- Apache Derby
- IBM DB2 Universal Database
- Microsoft SQL Server
- Oracle
- Select later (database disabled).

Description

Creates and configures an embedded Apache Derby database. The Apache Derby application is included.

An external database application might be more appropriate for large networks. Database tools such as ij cannot be used when IBM Director is running.

Figure 18. Installing IBM Director Server: "IBM Director database configuration" window

20. Click the database application that you want to use with IBM Director. You have the following options:

Apache Derby
Creates and configures an embedded Apache Derby database. The Apache Derby application is included in the IBM Director installation.

IBM DB2 Universal Database
Configures a DB2 database. The DB2 Java JDBC Type 4 Universal driver must be installed on the management server. It is installed through the DB2 Run-time or Administration Client. Only the Java support selection is required. IBM DB2 Universal Database must be installed and configured on a system in your network. This is located on the DB2 Run-time or Administration Client.

Microsoft Data Engine (MSDE) 2000 or Microsoft SQL Server 2000
Creates a Microsoft SQL Server database. Microsoft SQL Server must be installed and configured on a system in your network.

Oracle Configures an Oracle database. Oracle Server must be installed and configured on a system in your network.

Select later (database disabled)
IBM Director will be installed without a database. Tasks requiring a database will be absent or not functional.

21. Click **Next** and begin configuring the IBM Director database.

If the database application is	Complete the applicable steps
Apache Derby	The ″IBM Director Apache Derby configuration″ window opens. The values cannot be changed. Click **Next** and go to step 22 on page 211.
IBM DB2 Universal Database	The "IBM Director DB2 Universal Database configuration" window opens. Complete the following entry fields: 1. In the **DB2 TCP/IP listener port** field, type the number of the port that is used by the DB2 TCP/IP listener. 2. In the **Server name** field, type the name of the server on which DB2 is installed. 3. In the **Database name** field, type the name of the database. 4. In the **User ID** field, type a valid DB2 user ID. 5. In the **Password** field, type the password for the DB2 user ID. Click **Next**.
MSDE or Microsoft SQL Server	The "IBM Director Microsoft SQL Server database configuration" window opens. Type information in the following entry fields: 1. In the **SQL Server TCP/IP listener port** field, type the number of the port that is used by the SQL Server TCP/IP listener. 2. In the **Server name** field, type the name of the server on which SQL Server is installed. 3. In the **Database name** field, type the name of the database. If it does not exist, it will be created. 4. In the **User ID** field, type a valid SQL Server user ID. 5. In the **Password** field, type the password for the SQL Server user ID. Click **Next**.

If the database application is	Complete the applicable steps
Oracle Server	The “IBM Director Oracle database configuration” window opens. Type information in the following entry fields: 1. In the **Oracle TCP/IP listener port** field, type the number of the port that is used by the Oracle TCP/IP listener. 2. In the **Oracle host name** field, type the TCP/IP host name of the database server. 3. In the **Oracle System Identifier (SID)** field, type the Oracle system identifier (SID). 4. In the **User ID** field, type a valid Oracle user ID. If it does not exist, it is created. By default, this user ID is assigned to the IBM Director table space. 5. In the **Password** and **Confirm password** fields, type the password that is associated with the user ID that you entered in step 4. 6. In the **Oracle administrator account** field, type a valid user ID for the Oracle administrator account. 7. In the **Oracle administrator password** field, type the password that is associated with the user ID that you entered in step 6. Click **Next**. A second “IBM Director Oracle database configuration” window opens. Type information in the following entry fields: 1. In the **Default tablespace name** field, type a table space name. 2. In the **Default tablespace data file** field, type the name of the table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 3. In the **Default tablespace size (MB)** field, type the size of the table space in MB. 4. In the **Temporary tablespace name** field, type a name for the temporary table space. 5. In the **Temporary tablespace data file** field, type the name of the temporary table space data file. If you do not specify the directory path, the table space data file will be created in the Oracle Server default directory. If you specify a directory path that is not valid, the database configuration will fail. 6. In the **Temporary tablespace size (MB)** field, type the size of the temporary table space in MB. Click **Next**.
Select later (database disabled)	Go to step 22

22. Click **Finish**. A window opens, asking you if you want to restart the server.
23. Remove the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD from the drive.
24. Click **Yes** to restart the server.

Performing an unattended installation of IBM Director Server on Windows:

This topic describes how to install IBM Director Server using a response file.

You can perform an unattended installation of IBM Director Server using a response file, which provides answers to the questions that are posed by the InstallShield wizard. You can use this method to create a standard installation file that can be used on many systems.

Important: The response file for IBM Director Server contains entries for a User ID and Password to use with the IBM Director service account. The User ID and Password must correspond to a Windows account with administrator privileges. If you choose to include this information in the response file, be sure to delete the file after the installation is complete to avoid security issues.

Complete the following steps to install IBM Director Server:

1. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
2. Copy the dirserv.rsp file to a local directory. This file is in the director\server\windows\i386 directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
3. Open the copy of the dirserv.rsp file in an ASCII text editor.
4. Modify and save the response file with a new file name. This file follows the Windows initialization (INI) file format and is fully commented.
5. Open a command prompt and change to the directory that contains the IBM Director Server installation file (ibmsetup.exe). This file is in the director\server\windows\i386 directory on the *IBM Director 5.10* CD.
6. From the command prompt, type the following command and press **Enter**:

   ```
   ibmsetup.exe installationtype rsp="responsefile.rsp" option
   ```

   where:
   - *installationtype* is one of the following commands:
     - `unattended` shows the progress of the installation but does not require any user input.
     - `silent` suppresses all output to the screen during installation.
   - *responsefile.rsp* is the path and name of the response file that you created in step 4.
   - *option* is one of the following optional parameters:

   Table 115. Optional installation parameters

Parameter	**What it does**
waitforme	Ensures that ibmsetup.exe process will not end until the installation of IBM Director Server is completed
debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
verbose	Enables verbose logging

7. If you set the RebootIfRequired parameter to Y in the response file, reboot the system if prompted to do so.
8. When the installation is completed, remove the CD from the drive.

Installing IBM Director Console

This topic contains instructions for installing IBM Director Console.

Note: IBM Director Server and IBM Director Console must be at the same release level. 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.

Installing IBM Director Console on AIX

This topic describes how to install IBM Director Console on AIX.

Complete the following steps to install IBM Director Console on AIX.

1. To install IBM Director Console from a Web download, perform the following steps:
   a. Download the dir5.10_console_aix.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_console_aix.tar file to a local directory.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:
      ```
      cd /directory/
      ```
      where *directory* is the local directory to which you extracted the files.
   d. If you want to customize the installation, go to step 1e. If you want to accept the default settings for the installation, type the following command and press **Enter:**
      ```
      ./dir5.10_console_aix.sh
      ```
      Go to step 3 on page 214.
   e. To customize the installation, copy the response file (dircon.rsp) to a local directory. Type the following command and press **Enter:**
      ```
      cp dircon.rsp /directory/
      ```
      where *directory* is the local directory.
   f. Open an ASCII text editor and modify the installation settings in the copy of the dircon.rsp file. This file is fully commented. You can specify the location of the RPM files and select log file options.
   g. Save the modified response file with a new file name.
   h. To install IBM Director Console using the response file, type the following command and press **Enter:**
      ```
      ./dir5.10_console_aix.sh -r /directory/response.rsp
      ```
      where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 1g.

      Go to step 3 on page 214.
2. To install IBM Director Console from the CD, perform the following steps:
   a. Insert the *IBM Director 5.10 for AIX 5L* CD into the drive.
   b. To mount the drive, type the following command and press **Enter**:
      ```
      mount -v cdrfs -o ro /dev/cd0 /mnt
      ```

where *dev/cd0* is the specific device file for the block device, and *mnt* is the mount point of the drive.

c. To change to the directory where IBM Director Console is located, type the following command and press **Enter**:

```
cd /mnt/director/console/aix
```

where *mnt* is the mount point of the drive.

d. To install IBM Director Console, type the following command and press **Enter**:

```
./dirinstall
```

Continue to step 3.

3. To start IBM Director Console, type the following command and press **Enter**:

```
/opt/ibm/director/bin/twgcon
```

4. If you installed IBM Director Console from the CD, unmount the drive. Type the following command and press **Enter**:

```
umount /mnt
```

where *mnt* is the mount point of the drive.

Remove the *IBM Director 5.10 for AIX 5L* CD from the drive.

Installing IBM Director Console on Linux for xSeries

This topic describes how to install IBM Director Console on a server running Linux for xSeries.

Complete the following steps to install IBM Director Console on Linux for xSeries:

1. To install IBM Director Console from a Web download, perform the following steps:

a. Download the dir5.10_console_linux.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

b. Extract the contents of the dir5.10_console_linux.tar file to a local directory.

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

```
cd /directory/
```

where *directory* is the local directory to which you extracted the files.

d. If you want to customize the installation, go to step 1e. If you want to accept the default settings for the installation, type the following command and press **Enter:**

```
./dir5.10_console_linux.sh
```

e. To customize the installation, copy the response file (dircon.rsp) to a local directory. Type the following command and press **Enter:**

```
cp dircon.rsp /directory/
```

where *directory* is the local directory.

f. Open an ASCII text editor and modify the installation settings in the dircon.rsp file. This file is fully commented. You can specify the location of the RPM files and select log file options.

g. Save the modified response file.

h. To install IBM Director Console using the response file, type the following command and press **Enter:**

```
./dir5.10_console_linux.sh -r /directory/response.rsp
```

where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file.

2. To install IBM Director Console from the CD, perform the following steps:

   a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.

   b. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

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

   where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.

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

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

   where *mnt/cdrom* is the mount point of the drive.

   Go to step 2d.

   d. If you want to customize the installation, go to step 2e. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   Go to step 2i.

   e. To customize the installation, copy the response file (dircon.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp dircon.rsp /directory
   ```

   where *directory* is the local directory.

   f. Open an ASCII text editor and modify the installation settings in the copy of the dircon.rsp file. This file is fully commented. You can specify the location of the RPM files, optional items that you want to install, and select log file options.

   g. Save the modified response file with a new file name.

   h. To install IBM Director Console using the modified response file, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/responsefile.rsp
   ```

   where *directory* is the local directory to which you copied the response file and *responsefile.rsp* is the name of the modified response file as saved in step 2g.

   i. To unmount the drive, complete the following steps:

      1) Type `cd /` and press **Enter**.

      2) Type the following command and press **Enter**:

      ```
      umount /mnt/cdrom
      ```

      where *mnt/cdrom* is the mount point of the drive.

j. Remove the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD from the drive.

Installing IBM Director Console on Linux for System z9 and zSeries

This topic describes how to install IBM Director Console on Linux for System z9 and zSeries.

Complete the following steps to install IBM Director Console on Linux for System z9 and zSeries:

1. Make the installation code from the *IBM Director 5.10 for Linux on System z9 and zSeries* CD available to your Linux system. See "Preparing to install IBM Director on a System z9 or zSeries server" on page 166 for more information.
2. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

   ```
   cd /mnt/director/console/linux/s390/
   ```

   where */mnt* is the mount point of the file system on the CD or the location of the IBM Director installation files.
3. If you want to customize the installation go to step 4. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirinstall
   ```

   Refer to the response file to view the default. The response file is named dircon.rsp and located in the same directory as the installation script. In the response file, "1" indicates that an item is to be installed and "0" indicates that an item is not to be installed.

   Go to step 9.
4. Copy the response file to a local directory. Type the following command and press **Enter**:

   ```
   cp dircon.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the dircon.rsp file. This file is fully commented.

   You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Console, type the following command and press **Enter**:

   ```
   ./dirinstall -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file and *response.rsp* is the name of the response file as saved in step 6.
8. **Optional:** Keep the response file for future use and reference.
9. To start IBM Director Console start a new terminal session, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgcon
   ```

Installing IBM Director Console on Linux for POWER

This topic describes how to install IBM Director Console on a server running Linux for POWER.

Complete the following steps to install IBM Director Console on Linux for POWER:

1. To install IBM Director Console from a Web download, perform the following steps:
   1. Download the dir5.10_console_linppc.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   2. Extract the contents of the dir5.10_console_linppc.tar file to a local directory.
   3. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /directory/
      ```

      where *directory* is the local directory to which you extracted the files.
   4. If you want to customize the installation, go to step 1e. If you want to accept the default settings for the installation, type the following command and press **Enter:**

      ```
      ./dir5.10_console_linppc.sh
      ```

      When the dir5.10_console_linppc.sh script finishes running, the installation is completed.
   5. To customize the installation, copy the response file (dircon.rsp) to a local directory. Type the following command and press **Enter:**

      ```
      cp dircon.rsp /directory/
      ```

      where directory is the local directory.
   6. Open an ASCII text editor and modify the installation settings in the copy of the dircon.rsp file. This file is fully commented. You can specify the location of the RPM files and select log file options.
   7. Save the modified response file with a new file name.
   8. To install IBM Director Console using the response file, type the following command and press **Enter:**

      ```
      ./dir5.10_console_linppc.sh -r /directory/response.rsp
      ```

      where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step "Installing IBM Director Console on Linux for POWER" on page 216.
2. To install IBM Director Console from the CD, perform the following steps:
   1. Insert the *IBM Director 5.10 for Linux on POWER* CD into the drive.
   2. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

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

      where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.
   3. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /mnt/cdrom/director/console/linux/ppc
      ```

      where *mnt/cdrom* is the mount point of the drive.

      Go to step 2d on page 218.

d. If you want to customize the installation, go to step 2e. If you want to accept the default settings for the installation, type the following command and press **Enter**:

```
./dirinstall
```

Go to step 2i.

e. To customize the installation, copy the response file (dircon.rsp) to a local directory. Type the following command and press **Enter**:

```
cp dircon.rsp /directory
```

where *directory* is the local directory.

f. Open an ASCII text editor and modify the installation settings in the copy of the dircon.rsp file. This file is fully commented. You can specify the location of the RPM files, optional items that you want to install, and select log file options.

g. Save the modified response file with a new name.

h. To install IBM Director Console using the modified response file, type the following command and press **Enter**:

```
./dirinstall -r /directory/responsefile.rsp
```

where *directory* is the local directory to which you copied the response file and *responsefile.rsp* is the name of the modified response file as saved in step 2g.

i. To unmount the drive, complete the following steps:

1) Type `cd /` and press **Enter**.

2) Type the following command and press **Enter**:

```
umount /mnt/cdrom
```

where *mnt/cdrom* is the mount point of the drive.

j. Remove the *IBM Director 5.10 for Linux on POWER* CD from the drive.

Installing IBM Director Console on Windows

This section describes how to install IBM Director Console on a system that is running Windows.

You can install IBM Director Console on any system from which you want to remotely access IBM Director Server.

This section provides instructions for installing IBM Director Console using the InstallShield wizard. The wizard can be used in a standard interactive mode, or you can perform an unattended installation using a response file to provide answers to the questions that the wizard poses.

Note: If Microsoft Windows Installer (MSI), version 3.0 or later is not installed on the system, it is installed during the IBM Director Console installation. If the upgrade is necessary, the system prompts you to restart following the installation of IBM Director Console without specifying that Microsoft Windows Installer was installed. Unless you install using the response file and set the RebootIfRequired parameter to N, you are prompted to restart whether or not the IBM Director Console installation is completed successfully.

In addition, if you attempt to perform an administrative installation and MSI has not yet been upgraded, you must change to the directory containing the ibmsetup.exe file and run the installation program using the following command:

```
ibmsetup.exe admin
```

This command updates MSI and runs the installation program in administrative mode. Restart the system if prompted to do so.

Installing IBM Director Console using the InstallShield wizard:

This topic describes how to install IBM Director Console on a system running Windows using the InstallShield wizard.

Complete the following steps to install IBM Director Console on Windows:

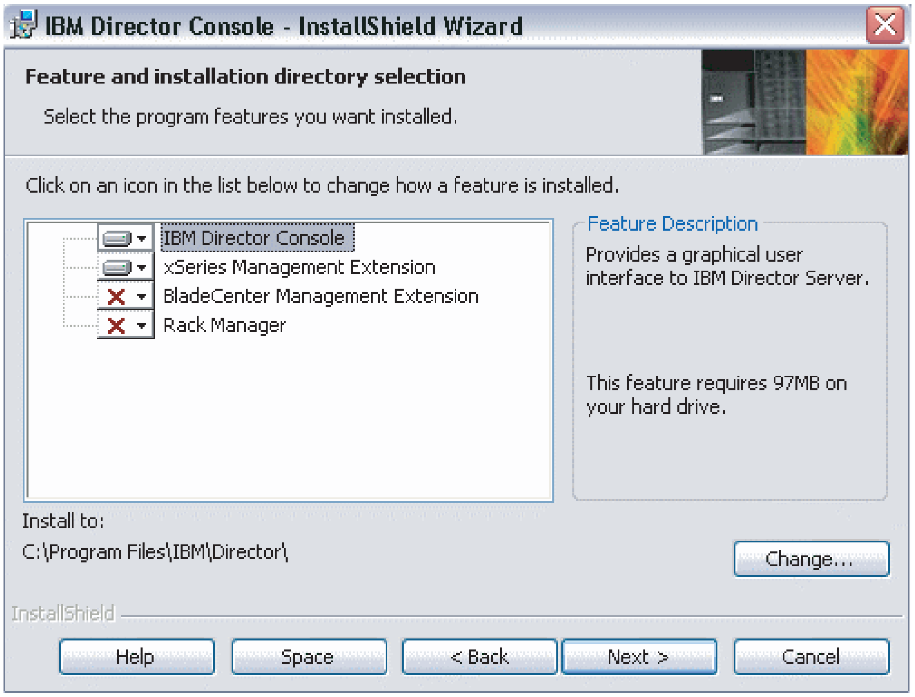
1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_console_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_console_windows.zip file to a local directory.
   c. Locate the dir5.10_console_windows.exe file and double-click it. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Console″ window opens. Go to step 3 on page 220.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   b. If the installation program starts automatically and the ″IBM Director Setup″ window opens, go to step 2d. Otherwise, click **Start** → **Run**.
   c. In the **Open** field, type the following command and press **Enter**:

      ```
      e:\setup.exe
      ```

      where *e* is the drive letter of the drive. The installation program starts, and the ″IBM Director Setup″ window opens.
   d. Click **Install IBM Director Console**. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Console″ window opens. Continue to step 3 on page 220.

   Accessibility note: Screen readers might not process the ″IBM Director Setup″ window correctly. To start the installation wizard for IBM Director Console using the keyboard, perform the following steps:
   a. Close the ″IBM Director Setup″ window.
   b. Open Windows Explorer.
   c. Browse to the director/console/windows/i386 directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   d. Execute the ibmsetup.exe program. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Console″ window opens. Continue to step 3 on page 220.

3. Click **Next**. The “License Agreement” window opens.
4. Click **I accept the terms in the license agreement**; then, click **Next**. The “Feature and installation directory selection” window opens.



IBM Director Console - InstallShield Wizard

Feature and installation directory selection

Select the program features you want installed.

Click on an icon in the list below to change how a feature is installed.

- 🖴 IBM Director Console
- 🖴 xSeries Management Extension
- ✗ BladeCenter Management Extension
- ✗ Rack Manager

Feature Description

Provides a graphical user interface to IBM Director Server.

This feature requires 97MB on your hard drive.

Install to:

C:\Program Files\IBM\Director\

Figure 19. Installing IBM Director Console: “Feature and installation directory selection” window

IBM Director Console and the xSeries Management Extension are selected automatically for installation; a hard disk drive icon 🖴 is displayed to the left of each component. A red X ✗ is displayed to the left of each of the optional features, BladeCenter Management Extension and Rack Manager.

5. To select BladeCenter Management Extension, a feature that manages and monitors BladeCenter systems, click the red X to the left of the feature name. A menu opens.

   Click either **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.
6. To select Rack Manager, which you can use to build a realistic, visual representation of a rack and its components, click the red X to the left of the feature name. A menu opens.

   Click either **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.
7. Click **Next**. The ″Ready to Install the Program″ window opens.
8. Click **Install**. The ″Installing IBM Director Console″ window opens. The status bar displays the progress of the installation. When the installation is completed, the ″InstallShield Wizard Completed″ window opens.
9. Click **Finish**.

Performing an unattended installation of IBM Director Console on Windows:

This topic describes how to install IBM Director Console using a response file.

You can perform an unattended installation of IBM Director Console using a response file, which provides answers to the questions that are posed by the InstallShield wizard. You can use this method to create a standard installation file that can be employed on many systems.

Complete the following steps to install IBM Director Console:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_console_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_console_windows.zip file to a local directory.
   c. Locate and copy the dircon.rsp file.
   d. Go to step 3.
2. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   a. If the installation program starts automatically and the "IBM Director Setup" window opens, close it.
   b. Copy the dircon.rsp file to a local directory. This file is in the director\console\windows\i386 directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   c. Go to step 3.
3. Open the copy of the dircon.rsp file in an ASCII text editor.
4. Modify and save the dircon.rsp file with a new file name. This file follows the Windows initialization (INI) file format and is fully commented.
5. Open a command prompt and change to the directory that contains the IBM Director Console installation file (ibmsetup.exe). This file is in the director\console\windows\i386 directory on the CD.
6. From the command prompt, type the following command and press **Enter**:

   ```
   ibmsetup.exe installationtype rsp="responsefile.rsp" option
   ```

   where:
   - *installationtype* is one of the following commands:
     – `unattended` shows the progress of the installation but does not require any user input.
     – `silent` suppresses all output to the screen during installation.
   - *responsefile.rsp* is the path and name of the response file that you saved in step 4.
   - *option* is one of the following optional parameters:

Table 116. Optional installation parameters

Parameter	What it does
waitforme	Ensures that ibmsetup.exe process will not end until the installation of IBM Director Console is completed
debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
verbose	Enables verbose logging

7. If you installed IBM Director Console from the CD, remove the CD from the drive when the installation is completed.

Installing Level 1: IBM Director Core Services

This topic describes how to install Level 1: IBM Director Core Services.

Installing Level 1: IBM Director Core Services on Linux for xSeries

This topic describes how to install IBM Director Core Services on a system that is running Linux for xSeries.

Complete the following steps to install Level 1: IBM Director Core Services on Linux for xSeries:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_coreservices_linux.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Decompress the contents of the dir5.10_coreservices_linux.tar file to a local directory.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /directory/FILES
      ```

      where *directory* is the local directory to which you decompressed the files.

      Go to step 3.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   b. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

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

      where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /mnt/cdrom/coresvcs/agent/linux/i386/FILES
      ```

      where *mnt/cdrom* is the mount point of the drive.

      Go to step 3.
3. If you want to customize the installation, go to step 4. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dir5.10_coreservices_linux.sh
   ```

   If you are installing from the CD, go to step 8 on page 223.

   If you are installing from a Web download, the installation is completed.
4. To customize the installation, copy the response file (coresvcs.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp coresvcs.rsp /directory/
   ```

where *directory* is the local directory.

5. Open an ASCII text editor and modify the installation settings in the copy of the coresvcs.rsp file. This file is fully commented.

   You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install Level 1: IBM Director Core Services using the response file, type the following command and press **Enter**:

   ```
   ./dir5.10_coreservices_linux.sh -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.
8. If you installed IBM Director Core Services from the CD, complete the following steps to unmount the drive:
   a. Type `cd /` and press **Enter**.
   b. Type the following command and press **Enter**:

      ```
      umount /mnt/cdrom
      ```

      where *mnt/cdrom* is the mount point of the drive.
9. Remove the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD from the drive.

After IBM Director Core Services is installed, you can enable the Wake on LAN feature.

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP, version 5.2.1. For more information, see "Enabling SNMP access and trap forwarding for Linux" on page 331.

Installing Level 1: IBM Director Core Services on Linux for System z9 and zSeries

This topic describes how to install Level 1: IBM Director Core Services on a system that is running Linux for System z9 and zSeries.

Complete the following steps to install Level 1: IBM Director Core Services on Linux for System z9 and zSeries:

1. Make the installation code from the *IBM Director 5.10 for Linux on System z9 and zSeries* CD available to your Linux system. See "Preparing to install IBM Director on a System z9 or zSeries server" on page 166 for more information.
2. From a terminal session on your Linux system, change to the directory in which the installation script is located. Type the following command and press **Enter**:

   ```
   cd /mnt/coresvcs/agent/linux/s390/FILES/
   ```

   where */mnt* is the mount point of the file system on the CD or the location of the IBM Director installation files.
3. If you want to customize the installation go to step 4 on page 224. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./csversion_agent_linz.sh
   ```

   where *version* is a string that identifies the version.

Refer to the response file to view the default. The response file is named coresvcs.rsp and located in the same directory as the installation script. In the response file, "1" indicates that an item is to be installed and "0" indicates that an item is not to be installed.

Go to step 9.

4. To customize the installation, copy the response file to a local directory. Type the following command and press **Enter**:

   ```
   cp coresvcs.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the coresvcs.rsp file. This file is fully commented.
6. Save the modified response file with a new file name.
7. To install IBM Director Core Services using the response file, type the following command and press **Enter**:

   ```
   ./csversion_agent_linz.sh -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file and *response.rsp* is the name of the response file as saved in step 6.
8. **Optional:** Keep the response file for future use and reference.
9. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/cfgsecurity
   ```

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP. Use the version included in your distribution.

Installing Level 1: IBM Director Core Services on Linux for POWER

This topic describes how to install Level 1: IBM Director Core Services on a system that is running Linux for POWER.

Complete the following steps to install Level 1: IBM Director Core Services on Linux for POWER:

1. To start the installation from a Web download, perform the following steps:
   a. Download the cs5.10_agent_linppc.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the cs5.10_agent_linppc.tar file to a local directory.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /directory/FILES
      ```

      where *directory* is the local directory to which you decompressed the files.

      Go to step 3 on page 225.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director version 5.10 for Linux on POWER* CD into the drive.
   b. If the CD automounts, go to step 2c on page 225. If the CD does not automount, type the following command and press **Enter**:

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

where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.

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

```
cd /mnt/cdrom/coresvcs/agent/linux/ppc/FILES
```

where *mnt/cdrom* is the mount point of the drive.

Go to step 3.

3. If you want to customize the installation, go to step 4. If you want to accept the default settings for the installation, type the following command and press **Enter**:

```
./cs5.10_agent_linppc.sh
```

Go to step 8.

4. To customize the installation, copy the response file (coresvcs.rsp) to a local directory. Type the following command and press **Enter**:

```
cp coresvcs.rsp /directory/
```

where *directory* is the local directory.

5. Open an ASCII text editor and modify the installation settings in the copy of the coresvcs.rsp file. This file is fully commented.

You can specify the location of the RPM files and select log file options.

6. Save the modified response file with a new file name.
7. To install IBM Director Core Services using the response file, type the following command and press **Enter**:

```
./cs5.10_agent_linppc.sh -r /directory/response.rsp
```

where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.

8. To unmount the media drive, complete the following steps:

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

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

```
umount /mnt/cdrom
```

where *mnt/cdrom* is the mount point of the media drive.

9. Remove the *IBM Director 5.10 for Linux on POWER* CD from the drive.

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP, version 5.2.1.

Installing Level 1: IBM Director Core Services on Windows

This section provides instructions for installing Level 1: IBM Director Core Services using the InstallShield wizard.

The wizard can be used in a standard interactive mode, or you can perform an unattended installation using a response file to provide answers to the questions that the wizard poses.

Note: If Microsoft Windows Installer (MSI), version 3.0 or later is not installed on the system, it is installed during the IBM Director Core Services installation. If the upgrade is necessary, the system prompts you to restart following the installation of IBM Director Core Services without specifying that Microsoft

Windows Installer was installed. Unless you install using the response file and set the RebootIfRequired parameter to N, you are prompted to restart whether or not the IBM Director Core Services installation is completed successfully,

In addition, if you attempt to perform an administrative installation and MSI has not yet been upgraded, you must change to the directory containing the dir5.10_coreservices_windows.exe file and run the installation program using the following command:

```
dir5.10_coreservices_windows.exe -a admin
```

This command updates MSI and runs the installation program in administrative mode. Restart the system if prompted to do so.

Installing Level 1: IBM Director Core Services on Windows using the InstallShield wizard:

This topic describes how to install Level 1: IBM Director Core Services using the InstallShield wizard on a system running Windows.

Complete the following steps to install Level 1: IBM Director Core Services on Windows using the InstallShield wizard:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_coreservices_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_coreservices_windows.zip file to a local directory.
   c. Locate the dir5.10_coreservices_windows.exe file and double-click it. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for Core Services″ window opens. Go to step 3 on page 227.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   b. If the installation program starts automatically and the ″IBM Director Setup″ window opens, go to step 2d. Otherwise, click **Start** → **Run**.
   c. In the **Open** field, type the following command and press **Enter**:

      ```
      e:\setup.exe
      ```

      where *e* is the drive letter of the drive. The installation program starts, and the ″IBM Director Setup″ window opens.
   d. Click **Install IBM Director Core Services**. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for Core Services″ window opens. Continue to step 3 on page 227.

   Accessibility note: Screen readers might not process the ″IBM Director Setup″ window correctly. To start the installation wizard for IBM Director Core Services using the keyboard, perform the following steps:

   a. Close the ″IBM Director Setup″ window.
   b. Open Windows Explorer.

   c. Browse to the coresvcs/agent/windows/i386/FILES directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   d. Execute the dir5.10_coreservices_windows.exe program. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for Core Services″ window opens. Continue to step 3.
3. Click **Next**. The ″License Agreement″ window opens.
4. Click **I accept the terms in the license agreement** and click **Next**. The ″Destination Folder″ window opens.

   To select an alternative location for the installation of IBM Director Core Services, click **Change** and select another directory.
5. Click **Next**. The ″Ready to Install the Program″ window opens.
6. Click **Install**. The status bar displays the progress of the installation. When the installation is completed, the ″InstallShield Wizard Completed″ window opens.
7. Click **Finish**.
8. If you installed IBM Director Core Services from the CD, remove the CD from the drive.

Performing an unattended installation of Level 1: IBM Director Core Services on Windows:

This topic describes how to perform an unattended installation of Level 1: IBM Director Core Services on a system that is running Windows.

You can perform an unattended installation of IBM Director Core Services using a response file, which provides answers to the questions that are posed by the InstallShield wizard. You can use this method to create a standard installation file that can be used on many systems.

Complete the following steps to install Level 1: IBM Director Core Services on Windows:
1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_coreservices_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_coreservices_windows.zip file to a local directory.
   c. Locate and copy the coresvcs.rsp file. This file is in the *local*\FILES directory where *local* is the local directory to which you extracted the contents of the dir5.10_coreservices_windows.zip file.
   d. Go to step 3.
2. Insert the *IBM Director 5.10* CD into the drive.
   a. If the installation program starts automatically and the ″IBM Director Setup″ window opens, close it.
   b. Copy the response file (coresvcs.rsp) to a local directory. This file is in the coreservices\agent\windows\i386\FILES directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   c. Go to step 3.
3. Open the copy of the coresvcs.rsp file in an ASCII text editor.

4. Modify and save the response file with a new file name. This file follows the Windows INI file format and is fully commented.
5. Open a command prompt and change to the directory that contains the IBM Director Core Services installation file (dir5.10_coreservices_windows.exe).
6. From the command prompt, type the following command (all on one line) and press **Enter**:

   ```
   dir5.10_coreservices_windows.exe /s /a installationtype rsp="responsefile.rsp"
    option
   ```

   where:
   - /s is an optional parameter that suppresses all file extraction dialogs.
   - *installationtype* is one of the following commands:
     - unattended shows the progress of the installation but does not require any user input.
     - silent suppresses all output to the screen during installation.
   - *responsefile.rsp* is the path and name of the response file that you created in step 4.
   - *option* is one of the following optional parameters:

Table 117. Optional installation parameters

Optional parameter	What it does
waitforme	Ensures that dir5.10_coreservices_windows.exe process will not end until the installation of IBM Director Core Services is completed
debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
verbose	Enables verbose logging

7. If you set the RebootIfRequired parameter to Y in the response file, reboot the system if prompted to do so.
8. If you installed IBM Director Core Services from the CD, remove the CD from the drive.

Installing IBM Director Core Services using the Software Distribution task

This topic describes how to install IBM Director Core Services using the Software Distribution task.

You can use the IBM Director Software Distribution task to install IBM Director Core Services on managed systems running Windows or Linux.

The following files describe IBM Director Core Services:

- dir5.10_coreservices_linux.xml

  This file is located in the coresvcs/agent/linux/386/META-INF directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
- dir5.10_coreservices_windows.xml

  This file is located in the coresvcs\agent\windows\386\META-INF directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.

- cs5.10_agent_linppc.xml

  This file is located in the coresvcs/agent/linux/ppc/META-INF directory on the *IBM Director 5.10 for Linux on Power* CD.

(xSeries; Windows only) The following file describes both IBM Director Core Services and OpenSSH:

- dir5.10_coreservices-toc_windows.xml

  This file is located in the coresvcs directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.

  When the dir5.10_coreservices-toc_windows.xml file is imported by the IBM Update Assistant, a software-distribution category containing both IBM Director Core Services and OpenSSH is created, allowing them both to be installed at the same time.

  The OpenSSH package can be used to provide a secure remote interface between a Level-1 managed system and IBM Director Server. Use the OpenSSH interface to run the Remote Session task or the cimsubscribe utility from IBM Director Server. The cimsubscribe utility provides a command-line interface for creating event subscriptions.

(xSeries only) The following files describe the IBM LM78 device driver and the IBM SMBus device driver:

- lm78driver_linux.xml
- smbdriver_linux.xml

You can download these files from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/. They are included in the .gz files containing the device drivers to which they apply.

When you import the XML files into IBM Director, the IBM Update Assistant creates software packages. Then, you can use the IBM Director Software Distribution task to distribute the packages to the managed systems.

To install the IBM LM78 or SMBus device driver using the Software Distribution task, you first must build the binary RPM file and copy it to the same directory as the smbdriver_linux.xml file.

Note: If an earlier version of the IBM LM78 or SMBus device driver for Linux is installed on the managed system, you must uninstall the device driver before installing version 5.10 of the driver.

Related reference

"IBM LM78 and SMBus device drivers for Linux" on page 161
This topic describes when to install the LM78 and SMBus device drivers for Linux.

Creating a software package:

This topic describes how to create a software package for installing or upgrading IBM Director Agent or installing IBM Director Core Services.

Complete the following steps to create a software package:

1. Locate the installation or upgrade packages. Refer to “Installing IBM Director Core Services using the Software Distribution task” on page 228 or “Installing IBM Director Agent using the Software Distribution task” on page 258 for more information.
2. If you want to accept the default settings for the installation, go to step 3. Otherwise, copy the response file (diragent.rsp for IBM Director Agent; coresvcs.rsp for IBM Director Core Services) and open the copy in an ASCII text editor. Modify the response file as needed; then, save the modified file with a new file name.
3. Start IBM Director Console.
4. In the Tasks pane, double-click **Software Distribution**. The ″Software Distribution Manager″ window opens.

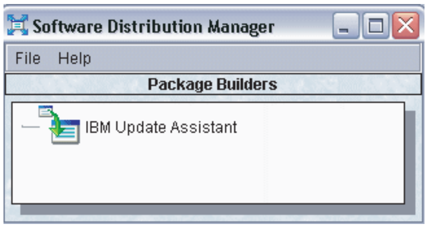


Figure 20. Creating a software package: ″Software Distribution Manager″ window (Standard Edition)

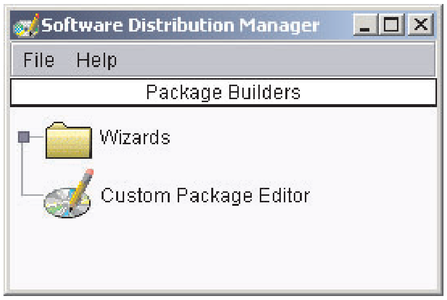
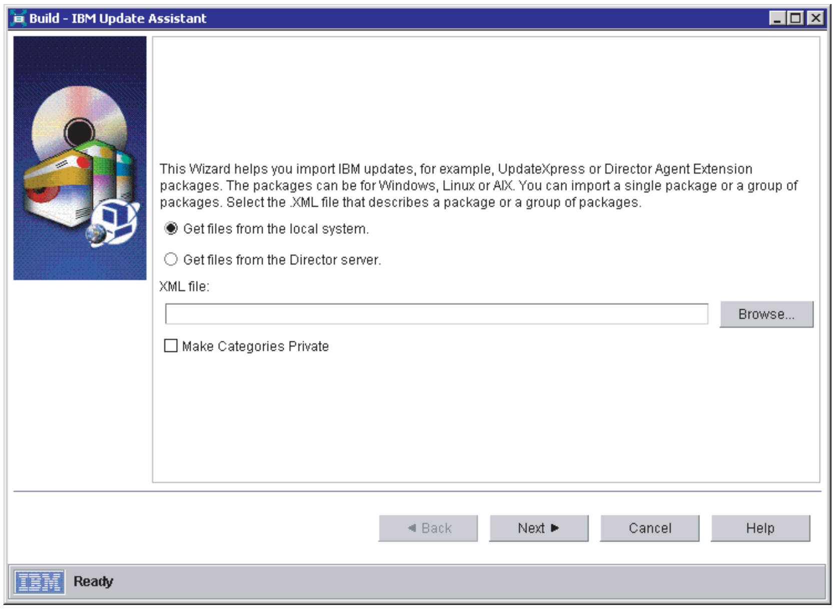


Figure 21. Creating a software package: Software Distribution Manager window (Premium Edition)

5. If you have not installed IBM Director 5.10 Software Distribution (Premium Edition), go to step 6. Otherwise, expand the **Wizards** tree.
6. Double-click **IBM Update Assistant**. The ″IBM Update Assistant″ window opens.



Build - IBM Update Assistant

This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

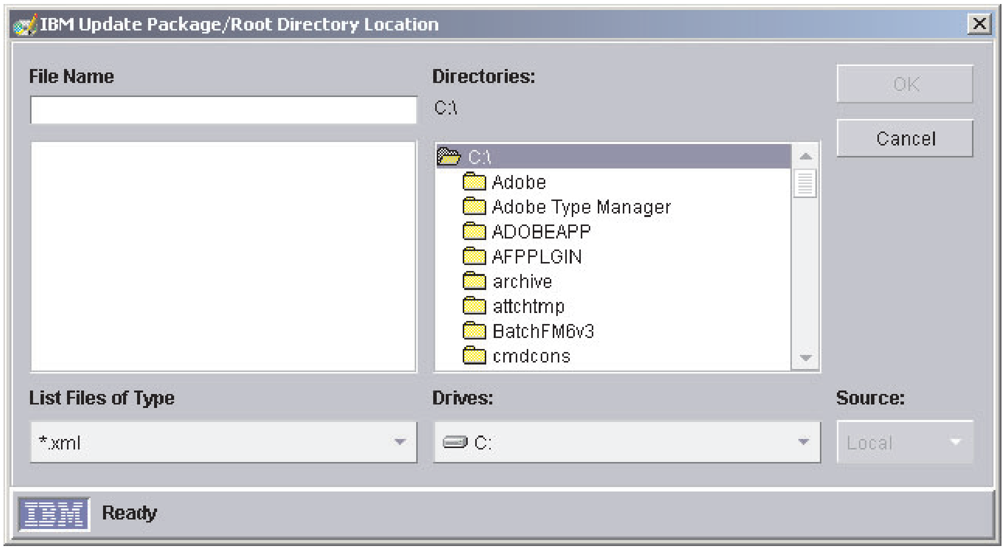
○ Get files from the Director server.

XML file:

□ Make Categories Private

Figure 22. Creating a software package: "IBM Update Assistant" window

7. If you want to get files from the management server, click **Get files from the Director server**. By default, **Get files from the local system** is selected.
8. To select a file, click **Browse**. The "IBM Update Package/Root Directory Location" window opens.



IBM Update Package/Root Directory Location

File Name

Directories:

C:\

List Files of Type: *.xml

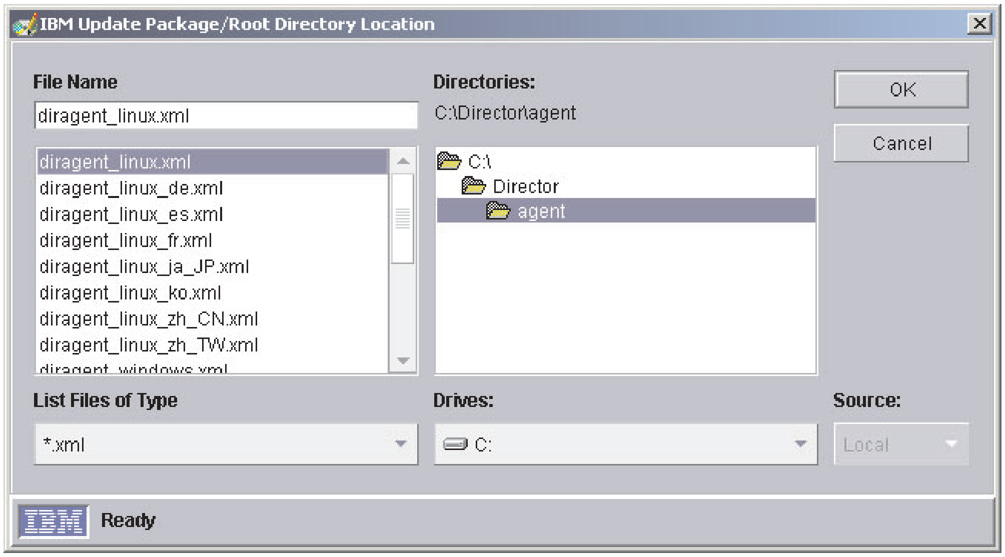
Drives: C:

Source: Local

Figure 23. Creating a software package: "IBM Update Package/Root Directory Location" window

9. Locate the appropriate XML file and click it. The name of the XML file is displayed in the **File Name** field.

   Note: Use the correct XML file for your language. The correct file for English installations is the one without the language code. For example, dir5.10_agent_windows.xml



File Name

diragent_linux.xml

diragent_linux.xml
diragent_linux_de.xml
diragent_linux_es.xml
diragent_linux_fr.xml
diragent_linux_ja_JP.xml
diragent_linux_ko.xml
diragent_linux_zh_CN.xml
diragent_linux_zh_TW.xml
diragent_windows.xml

Directories:

C:\Director\agent

C:\
Director
agent

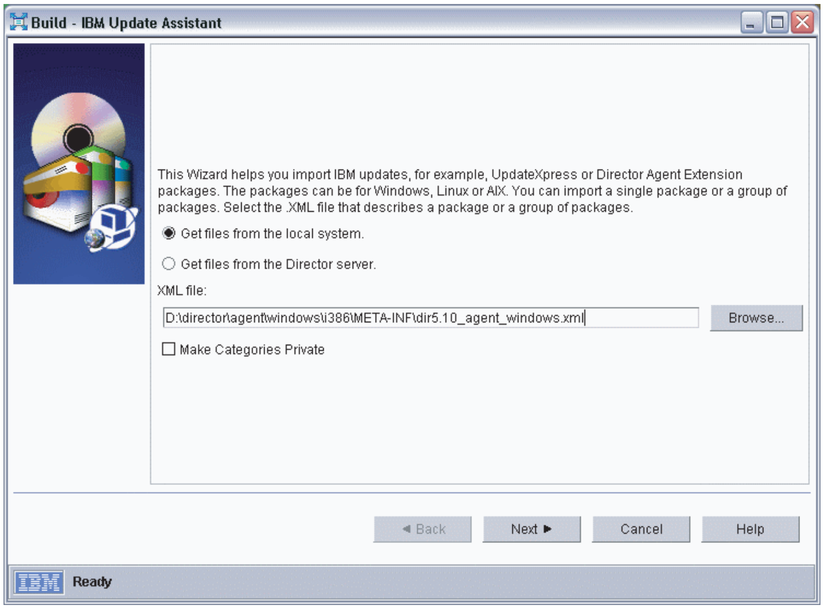
List Files of Type: *.xml

Drives: C:

Source: Local

Figure 24. Creating a software package: "IBM Update Package/Root Directory Location" window

10. Click **OK**. The "IBM Update Assistant" window reopens.



This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

○ Get files from the Director server.

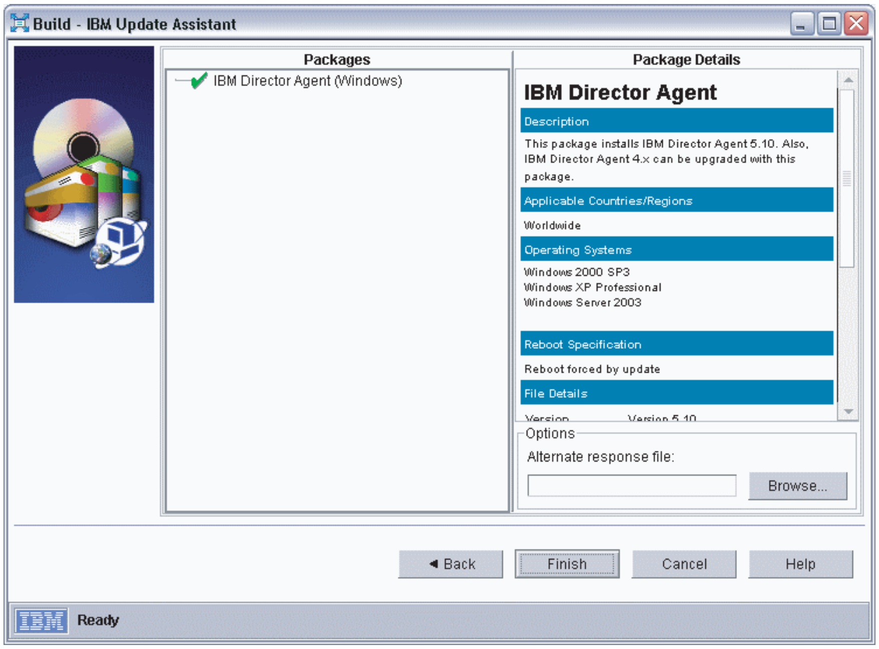
XML file:

D:\director\agent\windows\i386\META-INF\dir5.10_agent_windows.xml

□ Make Categories Private

Figure 25. Creating a software package: "IBM Update Assistant" window

11. Click **Next**. The second "IBM Update Assistant" window opens.


Build - IBM Update Assistant

Packages

IBM Director Agent (Windows)

Package Details

IBM Director Agent

Description

This package installs IBM Director Agent 5.10. Also, IBM Director Agent 4.x can be upgraded with this package.

Applicable Countries/Regions

Worldwide

Operating Systems

Windows 2000 SP3
Windows XP Professional
Windows Server 2003

Reboot Specification

Reboot forced by update

File Details

Version Version 5.10

Options

Alternate response file:

Figure 26. Creating software packages: "IBM Update Assistant" window

12. To specify an alternative response file, click **Browse** and locate the file that you modified in step 2 on page 230.

    Note: If you do not specify an alternative response file, the package is installed with the default settings that are specified in the installation script.

13. Click **Finish**. As the package is processed, a status message is displayed at the bottom of the window.

    When the processing is completed, the software-distribution package is displayed in the Tasks pane of IBM Director Console.

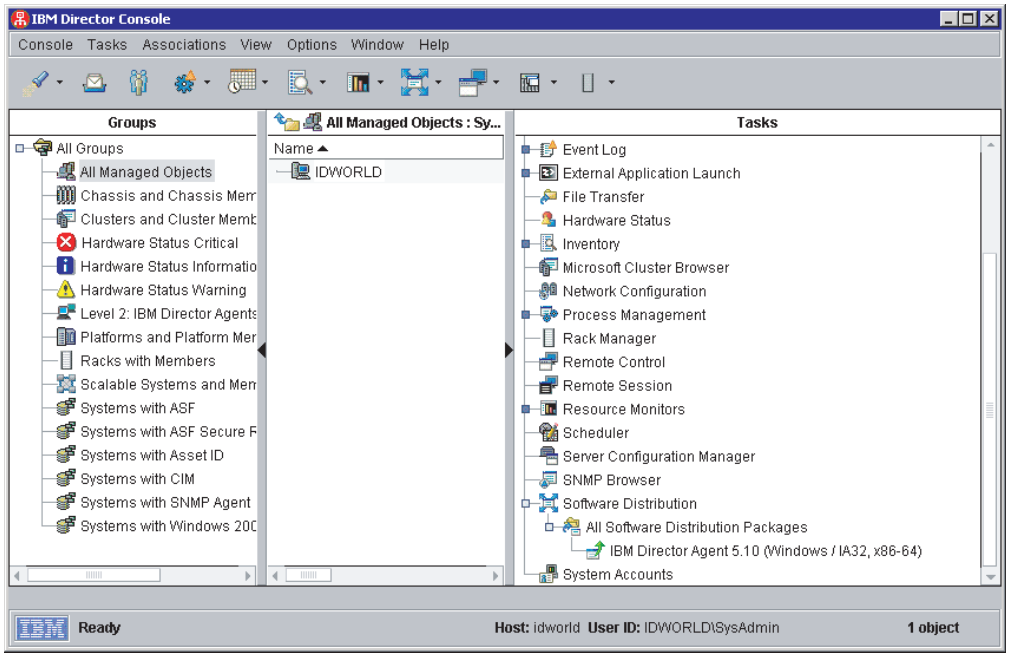


Figure 27. All Software Distribution Packages: IBM Director Agent Upgrade

Installing a software package:

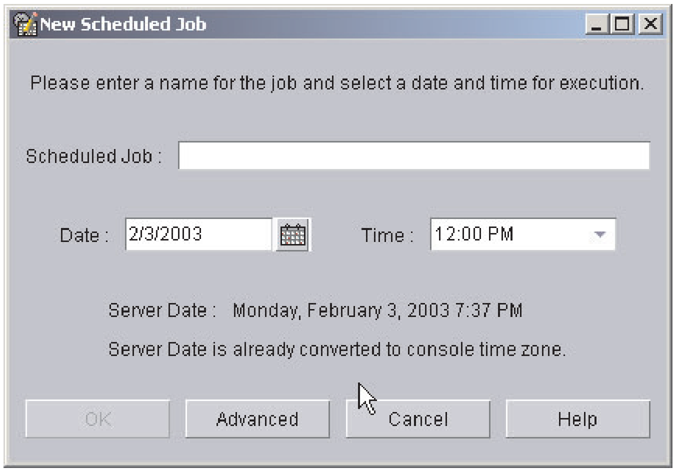
This topic describes how to install a software package using IBM Director.

Note: The Software Distribution task copies the installation package to the client system before starting the installation. On systems running AIX, the package is copied to the root file system. There must be at least 60 MB of free space available in the root file system or the task will fail.

Complete the following steps to install a software package:

1. Start IBM Director Console.
2. In the Tasks pane, expand the Software Distribution task.
3. Click the software package that you want to distribute. Then, drag it into the Group Contents pane and drop it onto the icon that is displayed for the system on which you want to install the software package. A window opens.

   Note: To distribute software to several systems at once, you can drag the software package into the Groups pane and drop it onto the icon for the group. Alternatively, you can select multiple managed systems in the Group Contents pane.
4. When prompted with `Do you wish to create a scheduled job for this task or execute immediately?`, click **Schedule** or **Execute Now**. If you click **Execute Now**, the software package is distributed immediately. If you click **Schedule**, the "New Scheduled Job" window opens.


New Scheduled Job

Please enter a name for the job and select a date and time for execution.

Scheduled Job :

Date : 2/3/2003 Time : 12:00 PM

Server Date : Monday, February 3, 2003 7:37 PM

Server Date is already converted to console time zone.

Figure 28. Scheduling the installation of a software package: "New Scheduled Job" window

5. Schedule the job:
   a. In the **Scheduled Job** field, type a unique name for the job. This name is displayed in the Jobs pane of the Scheduler window.
   b. In the **Date** field, type the day you want the software package to be installed (in MM/DD/YYYY format).
   c. In the **Time** field, type the time you want the software package to be installed.

   For more information about the Scheduler task, see the *IBM Director 5.10 Systems Management Guide*.
6. Click **OK**. The Save Job Confirmation window opens.
7. Click **OK**.

Installing Level 2: IBM Director Agent

This topic contains instructions for installing Level 2: IBM Director Agent.

Notes:

- The version of IBM Director Agent cannot be later than the version of IBM Director Server running on the management system.
- 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.

Installing Level 2: IBM Director Agent on AIX

This topic describes how to install IBM Director Agent on AIX.

Complete the following steps to install Level 2: IBM Director Agent on AIX:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_agent_aix.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_agent_aix.tar file to a local directory.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /directory/FILES
      ```

where *directory* is the local directory to which you extracted the files.

Go to step 3.

2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director version 5.10 for AIX 5L* CD into the drive.
   b. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

      ```
      mount /dev/cd0 /mnt
      ```

      where *dev/cd0* is the specific device file for the block device and *mnt* is the mount point of the drive.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /mnt/director/agent/aix/FILES
      ```

      where *mnt* is the mount point of the drive.

      Go to step 3.
3. If you want to customize the installation, go to step If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dir5.10_agent_aix.sh
   ```

   Go to step 8.
4. To customize the installation, copy the response file (diragent.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp diragent.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the diragent.rsp file. This file is fully commented. You can specify the location of the .bff files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Agent using the response file, type the following command and press **Enter**:

   ```
    ./dir5.10_agent_aix.sh -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.
8. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/cfgsecurity
   ```
9. To start IBM Director Agent, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstart
   ```
10. If you installed IBM Director Agent from the CD, type the following command and press **Enter** to unmount the drive:

    ```
    umount /mnt
    ```

    where *mnt* is the mount point of the drive. Remove the *IBM Director 5.10 for AIX 5L* CD from the drive.

After IBM Director Agent is installed, you can enable the Wake on LAN feature. To determine if your server supports this feature, review the server documentation.

Installing Level 2: IBM Director Agent on i5/OS

This topic describes how to install Level 2: IBM Director Agent on i5/OS (V5R3). You can select the appropriate method based on your environment.

Installing IBM Director Agent using the Virtualization Engine:

This topic describes how you can install IBM Director Agent using the Remote Package Deployer, a part of the Virtualization Engine.

Before you distribute IBM Director Agent, you must have installed IBM Director Server along with IBM Director Agent images on your management server.

Using Remote Package Deployer:

You can install IBM Director Agent, Directori5OSRPD_agentpackagedIU.xml, from a command line using Remote Package Deployer (RPD). The default location for this file on the management server is at /QIBM/ProdData/VE2/ManagedNodes/Directori5OS/META-INF. With RPD you must install IBM Director Agent to one system at a time. Refer to the instructions in the Virtualization Engine topic, Distributing agent software without IBM Director.

Installing IBM Director agent using RSTLICPGM:

If you do not plan to use IBM Director in a Virtualization Engine environment, you can install IBM Director Agent on i5/OS using the Restore Licensed Program (RSTLICPGM) command.

If you are upgrading from a previous version of IBM Director, migration of the product will be processed during the RSTLICPGM processing.

To install IBM Director Agent using RSTLICPGM, complete the following steps:

1. On the IBM Director for i5/OS installation media, locate the Directori5OSAgent.zip file. The ZIP file contains the SAVDA100MM.sav file.
2. Use FTP to transfer SAVDA100MM.sav into a save file on the i5/OS system where you want to install IBM Director Agent.
3. Use RSTLICPGM to install the product. In the following example, *SAVDA100MM* is the name of the save file to which SAVDA100MM.sav was transferred.

   ```
   RSTLICPGM LICPGM(5722DA1) DEV(*SAVF) SAVF(QGPL/SAVDA100MM)
   ```

Installing Level 2: IBM Director Agent on Linux for xSeries

This topic describes how to install Level 2: IBM Director Agent on a system that is running Linux for xSeries.

Complete the following steps to install Level 2: IBM Director Agent on Linux for xSeries:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_agent_linux.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_agent_linux.tar file to a local directory.

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

```
cd /directory/FILES
```

where *directory* is the local directory to which you extracted the files.

Go to step 3.

2. To start the installation from the CD, perform the following steps:

a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.

b. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

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

where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.

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

```
cd /mnt/cdrom/director/agent/linux/i386/FILES
```

where *mnt/cdrom* is the mount point of the drive.

Go to step 3.

3. If you want to customize the installation, go to step 4. If you want to accept the default settings for the installation, type the following command and press **Enter**:

```
./dir5.10_agent_linux.sh
```

Go to step 8.

4. To customize the installation, copy the response file (diragent.rsp) to a local directory. Type the following command and press **Enter**:

```
cp diragent.rsp /directory
```

where *directory* is the local directory.

5. Open an ASCII text editor and modify the installation settings in the copy of the diragent.rsp file. This file is fully commented.
6. Save the modified response file with a new file name.
7. To install IBM Director Agent using the response file, type the following command and press **Enter**:

```
 ./dir5.10_agent_linux.sh -r /directory/response.rsp
```

where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.

8. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

```
/opt/ibm/director/bin/cfgsecurity
```

9. To start IBM Director Agent, type the following command and press **Enter**:

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

10. If you installed IBM Director Agent from the CD, complete the following steps to unmount the drive:

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

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

```
umount /mnt/cdrom
```

where *mnt/cdrom* is the mount point of the CD-ROM drive. Remove the CD from the drive.

After IBM Director Agent is installed, you can enable the Wake on LAN feature. For more information, see “Enabling the Wake on LAN feature for Linux or AIX” on page 329

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP, version 5.2.1. For more information, see “Enabling SNMP access and trap forwarding for Linux” on page 331.

Installing Level 2: IBM Director Agent on Linux for System z9 and zSeries

This topic describes how to install Level 2: IBM Director Agent on a system that is running Linux for System z9 and zSeries.

Complete the following steps to install IBM Director Agent on Linux for System z9 and zSeries:

1. Make the installation code from the *IBM Director 5.10 for Linux on System z9 and zSeries* CD is available to your Linux system. See “Preparing to install IBM Director on a System z9 or zSeries server” on page 166 for more information.
2. From a terminal session on your Linux system, change to the directory in which the installation script is located. Type the following command and press **Enter**:

   ```
   cd /mnt/director/agent/linux/s390/FILES/
   ```

   where */mnt* is the mount point of the file system on the CD or the location of the IBM Director installation files.
3. If you want to customize the installation go to step 4. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirversion_agent_linz.sh
   ```

   where *version* is a string that identifies the version.

   Refer to the response file to view the default. The response file is named diragent.rsp and located in the same directory as the installation script. In the response file, “1” indicates that an item is to be installed and “0” indicates that an item is not to be installed.

   Go to step 10 on page 240.
4. To customize the installation, copy the response file to a local directory. Type the following command and press **Enter**:

   ```
   cp diragent.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the diragent.rsp file. This file is fully commented.

   You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Agent using the response file, type the following command and press **Enter**:

   ```
    ./dirversion_agent_linz.sh -r /directory/response.rsp
   ```

where *directory* is the local directory to which you copied the response file and *response.rsp* is the name of the response file as saved in step 6 on page 239.

8. **Optional:** Keep the response file for future use and reference.
9. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/cfgsecurity
   ```
10. To start IBM Director Agent begin a new terminal session, type the following command and press **Enter**:

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

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP. Use the version included in your distribution.

Installing Level 2: IBM Director Agent on Linux for POWER

This topic describes how to install Level 2: IBM Director Agent on a system that is running Linux for POWER.

Complete the following steps to install Level 2: IBM Director Agent on Linux for POWER:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_agent_linppc.tar file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_agent_linppc.tar file to a local directory.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /directory/FILES
      ```

      where *directory* is the local directory to which you extracted the files.

      Go to step 3.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director version 5.10 for Linux on POWER* CD into the drive.
   b. If the CD automounts, go to step 2c. If the CD does not automount, type the following command and press **Enter**:

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

      where *dev/cdrom* is the specific device file for the block device and *mnt/cdrom* is the mount point of the drive.
   c. Change to the directory in which the installation script is located. Type the following command and press **Enter**:

      ```
      cd /mnt/cdrom/director/agent/linux/ppc/FILES
      ```

      where *mnt/cdrom* is the mount point of the drive.

      Go to step 3.
3. If you want to customize the installation, go to step 4 on page 241. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dir5.10_agent_linppc.sh
   ```

   Go to step 8 on page 241.

4. To customize the installation, copy the response file (diragent.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp diragent.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the diragent.rsp file. This file is fully commented. You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Agent using the response file, type the following command and press **Enter**:

   ```
    ./dir5.10_agent_linppc.sh -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.
8. **Optional:** By default, encryption using the Advanced Encryption Standard (AES) algorithm is enabled during installation. To disable encryption or change security settings, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/cfgsecurity
   ```
9. To start IBM Director Agent, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstart
   ```
10. If you installed IBM Director Agent from the CD, perform the following steps to unmount the drive:
    a. Type `cd /` and press **Enter**.
    b. Type the following command and press **Enter**:

       ```
       umount /mnt/cdrom
       ```

       where *mnt/cdrom* is the mount point of the drive. Remove the CD from the drive.

After IBM Director Agent is installed, you can enable the Wake on LAN feature. For more information, see “Enabling the Wake on LAN feature for Linux or AIX” on page 329

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP, version 5.2.1. For more information, see “Enabling SNMP access and trap forwarding for Linux” on page 331.

Installing Level 2: IBM Director Agent on Linux for Intel Itanium (64 bit)

This topic describes how to install Level 2: IBM Director Agent on a system running Linux for Intel Itanium (64 bit).

Complete the following steps to install Level 2: IBM Director Agent on Linux for 64-bit Intel Itanium systems:

1. Download the dir5.10_agent_linux64.tar package from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
2. Extract the dir5.10_agent_linux64.tar file to a local directory.
3. If you want to customize the installation, go to step 4 on page 242. If you want to accept the default settings for the installation, type the following command and press **Enter**:

```
./dir5.10_agent_linux64.sh
```

Go to step 8.

4. To customize the installation, copy the response file (diragent.rsp) to a local directory. Type the following command and press **Enter**:

   ```
   cp diragent.rsp /directory
   ```

   where *directory* is the local directory.
5. Open an ASCII text editor and modify the installation settings in the copy of the diragent.rsp file. This file is fully commented.

   You can specify the location of the RPM files and select log file options.
6. Save the modified response file with a new file name.
7. To install IBM Director Agent using the response file, type the following command and press **Enter**:

   ```
    ./dir5.10_agent_linux64.sh -r /directory/response.rsp
   ```

   where *directory* is the local directory to which you copied the response file, and *response.rsp* is the name of the response file as saved in step 6.
8. To start IBM Director Agent, type the following command and press **Enter**:

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

After IBM Director Agent is installed, you can enable the Wake on LAN feature. For more information, see "Enabling the Wake on LAN feature for Linux or AIX" on page 329

To enable SNMP Access and Trap Forwarding, you must install and configure Net-SNMP, version 5.2.1. For more information, see "Enabling SNMP access and trap forwarding for Linux" on page 331.

Installing Level 2: IBM Director Agent on NetWare

This topic describes how to install Level 2: IBM Director Agent on NetWare.

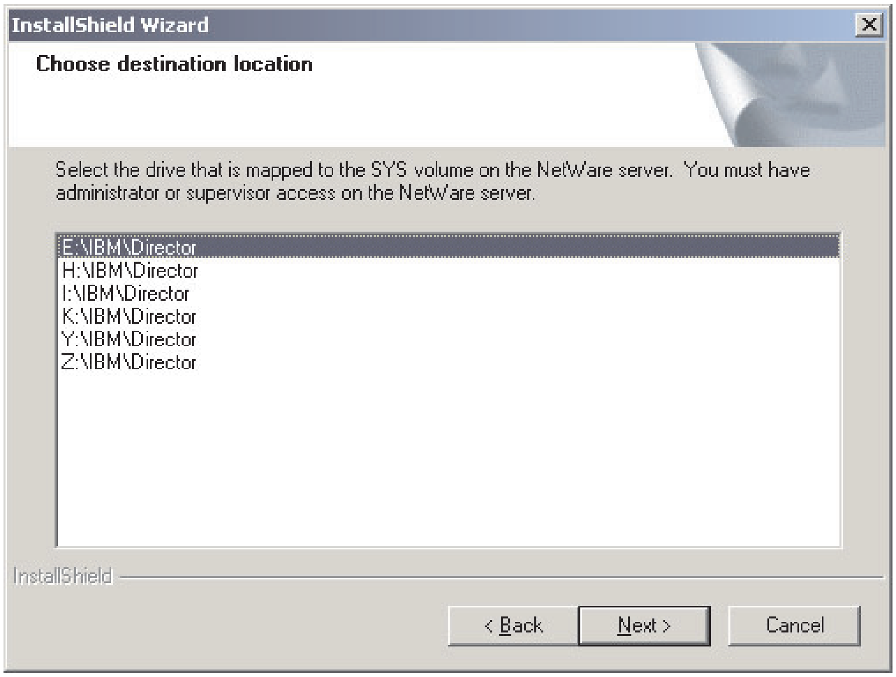
Notes:

1. (xSeries servers only) Install the MPA Agent only if the server has one of the following service processors installed:
   - Advanced System Management processor
   - Advanced System Management PCI adapter
   - Remote Supervisor Adapter
   - Remote Supervisor Adapter II
2. To install Level 2: IBM Director Agent, you must log on to the NetWare server from a Windows workstation running the NetWare Client for Windows. The SYS volume must be mapped as a drive to the system running Windows. Also, you must have administrator or supervisor access on the NetWare server.

Complete the following steps to install Level 2: IBM Director Agent on NetWare:

1. Download the dir5.10_agent_netware.zip from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
2. Extract the contents of the dir5.10_agent_netware.zip file to the Windows workstation running NetWare Client for Windows.

3. Start Windows Explorer and open the *directory*\FILES directory, where *directory* is the location to which you extracted the contents of the dir5.10_agent_netware.zip file.
4. Double-click the dir5.10_agent_netware.exe file. The InstallShield wizard starts.
5. Click **Next**. The ″Installing IBM Director Agent″ window opens.
6. Click **Next** to accept the license agreement. The “Choose destination location” window opens.


InstallShield Wizard

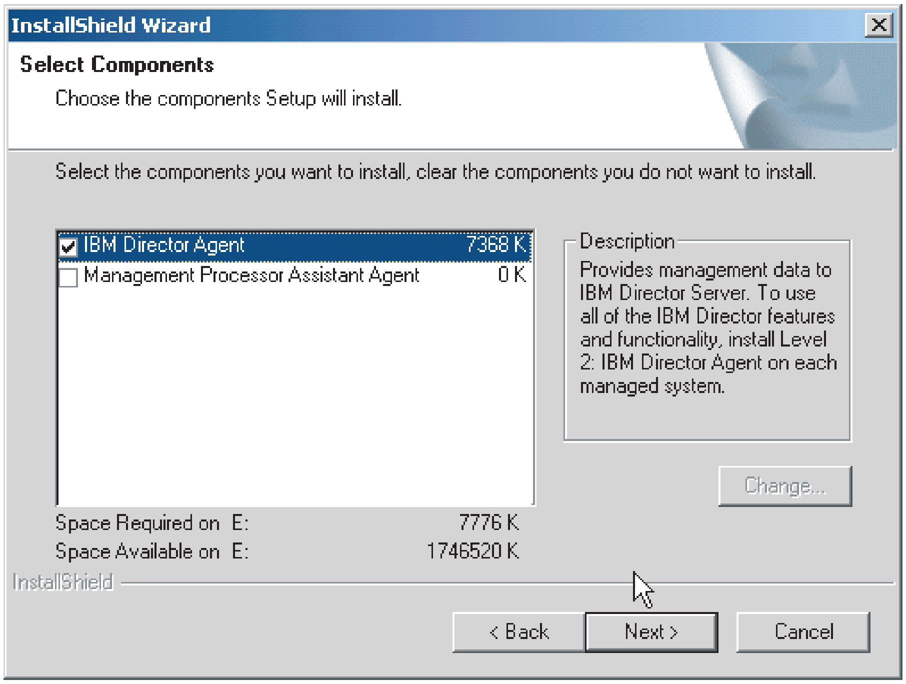
Choose destination location

Select the drive that is mapped to the SYS volume on the NetWare server. You must have administrator or supervisor access on the NetWare server.

E:\IBM\Director
H:\IBM\Director
I:\IBM\Director
K:\IBM\Director
Y:\IBM\Director
Z:\IBM\Director

Figure 29. Installing Level 2: IBM Director Agent on NetWare: “Choose destination location” window

7. Click the drive that is mapped to the SYS volume on the server running NetWare; then, click **Next**. The ″Select Components″ window opens.



InstallShield Wizard

Select Components

Choose the components Setup will install.

Select the components you want to install, clear the components you do not want to install.

☑ IBM Director Agent 7368 K

□ Management Processor Assistant Agent 0 K

Description

Provides management data to IBM Director Server. To use all of the IBM Director features and functionality, install Level 2: IBM Director Agent on each managed system.

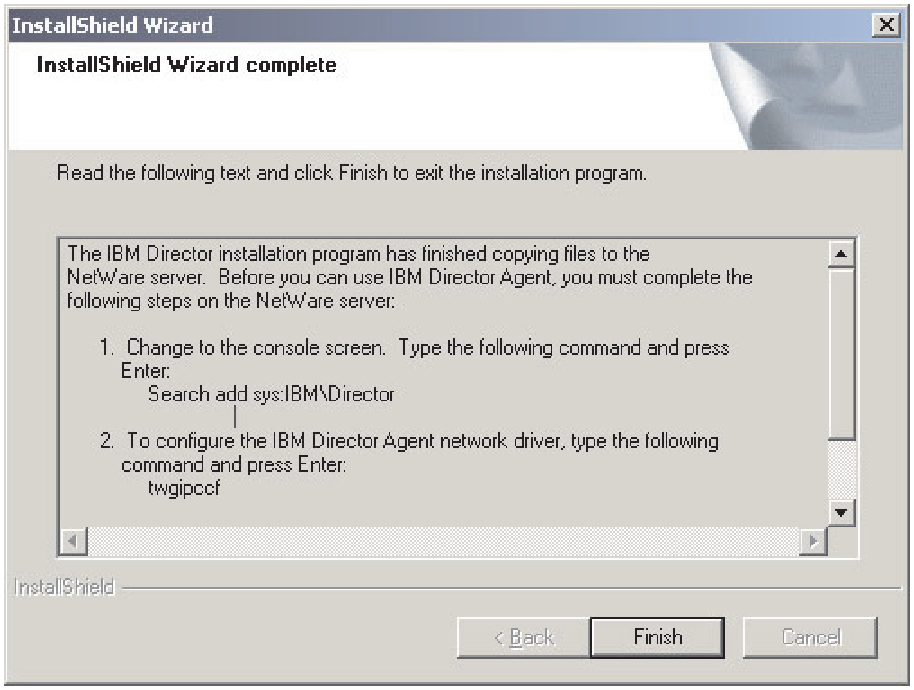
Space Required on E: 7776 K

Space Available on E: 1746520 K

Figure 30. Installing Level 2: IBM Director Agent on NetWare: "Select Components" window

IBM Director Agent is selected automatically for installation.

8. **Optional:** The Management Processor Assistant Agent enables communication with service processors in IBM xSeries and Netfinity servers. To enable the Management Processor Assistant Agent feature, select the check box.
9. Click **Next**. The "Setup Status window" opens, and Level 2: IBM Director Agent installation begins. When the installation is completed, the "InstallShield Wizard complete" window opens.



Read the following text and click Finish to exit the installation program.

The IBM Director installation program has finished copying files to the NetWare server. Before you can use IBM Director Agent, you must complete the following steps on the NetWare server:

1. Change to the console screen. Type the following command and press Enter:
   Search add sys:IBM\Director
2. To configure the IBM Director Agent network driver, type the following command and press Enter:
   twgipccf

Figure 31. Installing Level 2: IBM Director Agent on NetWare: "InstallShield Wizard complete" window

10. Click **Finish**.
11. On the server running NetWare, change to the console screen.
12. From the console, type the following command and press **Enter**:

    ```
    Search add sys:IBM\Director
    ```
13. To define the protocols to use for communication between IBM Director Server and IBM Director Agent, type the following command and press **Enter**:

    ```
    twgipccf
    ```

    Note: If you disable the TCPIP (all adapters) setting and enable an individual device driver on a system with multiple network adapters, IBM Director Agent will receive *only* those data packets that are addressed to the individual adapter.
14. To start IBM Director Agent, type the following command and press **Enter**:

    ```
    load twgipc
    ```

IBM Director Agent will start automatically whenever the server running NetWare starts.

Installing Level 2: IBM Director Agent on 32-bit Windows

This topic provides information about installation prerequisites and instructions for installing Level 2: IBM Director Agent using the InstallShield wizard on a system running 32-bit Windows.

The wizard can be used in a standard interactive mode, or you can perform an unattended installation using a response file to provide answers to the questions that the wizard poses.

Note: If Microsoft Windows Installer (MSI), version 3.0 or later is not installed on the system, it is installed during the IBM Director Agent installation. If the upgrade is necessary, the system prompts you to restart following the installation of IBM Director Agent without specifying that Microsoft Windows Installer was installed. Unless you install using the response file and set the RebootIfRequired parameter to N, you are prompted to restart whether or not the IBM Director Agent installation is completed successfully.

In addition, if you attempt to perform an administrative installation and MSI has not yet been upgraded, you must change to the directory containing the dir5.10_agent_windows.exe file and run the installation program using the following command:

```
dir5.10_agent_windows.exe -a admin
```

This command updates MSI and runs the installation program in administrative mode. Restart the system if prompted to do so.

Installing Level 2: IBM Director Agent on 32-bit Windows using the InstallShield wizard:

This topic describes how to install Level 2: IBM Director Agent on a system that is running 32-bit Windows using the InstallShield wizard.

Complete the following steps to install Level 2 : IBM Director Agent on 32-bit Windows using the InstallShield wizard:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_agent_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_agent_windows.zip file to a local directory.
   c. Locate the dir5.10_agent_windows.exe file and double-click it. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Agent″ window opens. Go to step 3 on page 247.
2. To start the installation from the CD, perform the following steps:
   a. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   b. If the installation program starts automatically and the ″IBM Director Setup″ window opens, go to step 2d. Otherwise, click **Start** → **Run**.
   c. In the **Open** field, type the following command and press **Enter**:

      ```
      e:\setup.exe
      ```

      where *e* is the drive letter of the drive. The installation program starts, and the ″IBM Director Setup″ window opens.
   d. Click **Install IBM Director Agent**. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Agent″ window opens. Continue to step 3 on page 247.

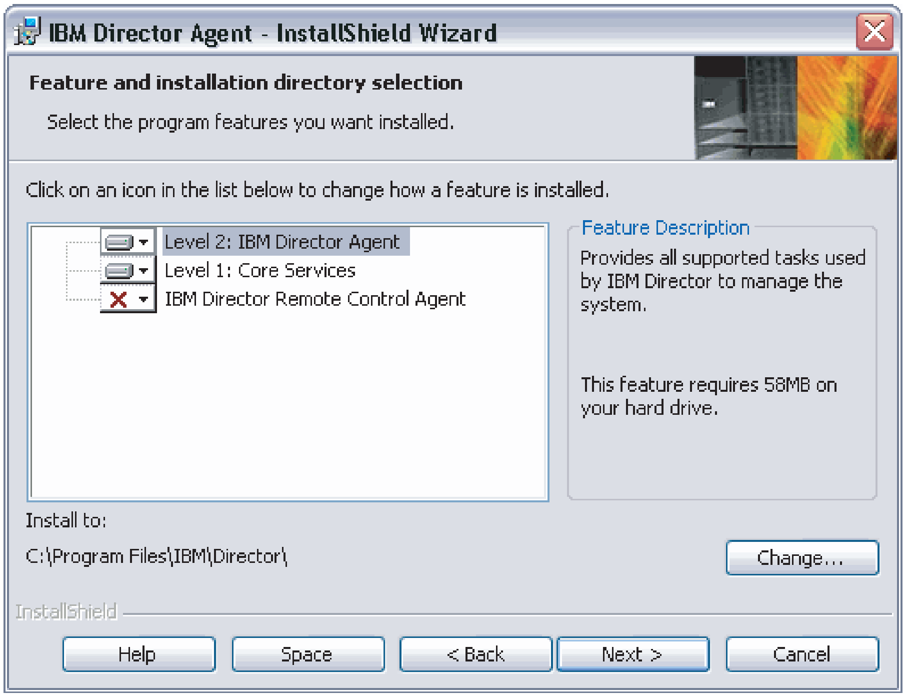
   Accessibility note: Screen readers might not process the ″IBM Director Setup″ window correctly. To start the installation wizard for IBM Director Agent using the keyboard, perform the following steps:

   a. Close the ″IBM Director Setup″ window.
   b. Open Windows Explorer.

c. Browse to the director/agent/windows/i386/FILES directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.

d. Execute the dir5.10_agent_windows.exe program. The InstallShield wizard starts, and the "Welcome to the InstallShield Wizard for IBM Director Agent" window opens. Continue to step 3.

3. Click **Next**. The "License Agreement" window opens.
4. Click **I accept the terms in the license agreement** and click **Next**. The “Feature and installation directory selection” window opens.
   Level 2: IBM Director Agent and Level 1: Core Services are selected automatically for installation; a hard disk drive icon 🖴 is displayed to the left of each component.



Feature and installation directory selection

Select the program features you want installed.

Click on an icon in the list below to change how a feature is installed.

- 🖴 Level 2: IBM Director Agent
- 🖴 Level 1: Core Services
- ✗ IBM Director Remote Control Agent

Feature Description

Provides all supported tasks used by IBM Director to manage the system.

This feature requires 58MB on your hard drive.

Install to:

C:\Program Files\IBM\Director\

Figure 32. Installing Level 2: IBM Director Agent on Windows: “Feature and installation directory selection” window

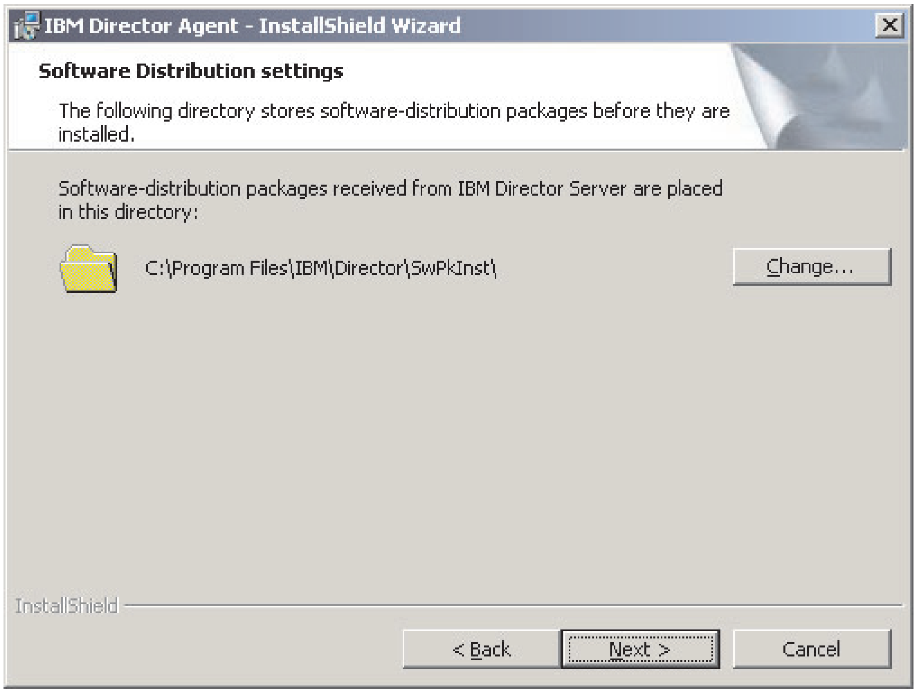
5. A red X ✗ is displayed to the left of IBM Director Remote Control Agent, which is optional. The IBM Director Remote Control Agent enables a system administrator to perform remote desktop functions on the management server. To install IBM Director Remote Control Agent, click the red X to the left of the feature name. A menu opens. Click either **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.
6. **Encrypt data transmissions between IBM Director Server and IBM Director Agent** is selected by default.

   Note: If encryption is enabled, the following conditions apply:
   - The managed system is automatically secured, and the **Secure – IBM Director Server must request access to manage this system** check box is unavailable.

- Only management servers with encryption enabled are able to communicate with the managed system.

To accept this setting, go to step 8. If you do not want to encrypt transmissions between IBM Director Server and IBM Director Agent, clear the check box and go to step 7.

7. Select the **Secure – IBM Director Server must request access to manage this system** check box. This ensures that only authorized instances of IBM Director Server can manage this system.
8. **Optional:** In the **Add Known Server Address** field, enter a comma-separated list of IBM Director Server addresses to which IBM Director Agent should announce itself. The format for this field is <*protocol*>::<*address*>. For example, TCPIP::10.3.1.4, TCPIP::192.168-1.10.
9. Click **Next**. The “Software Distribution settings” window opens.



Software Distribution settings

The following directory stores software-distribution packages before they are installed.

Software-distribution packages received from IBM Director Server are placed in this directory:

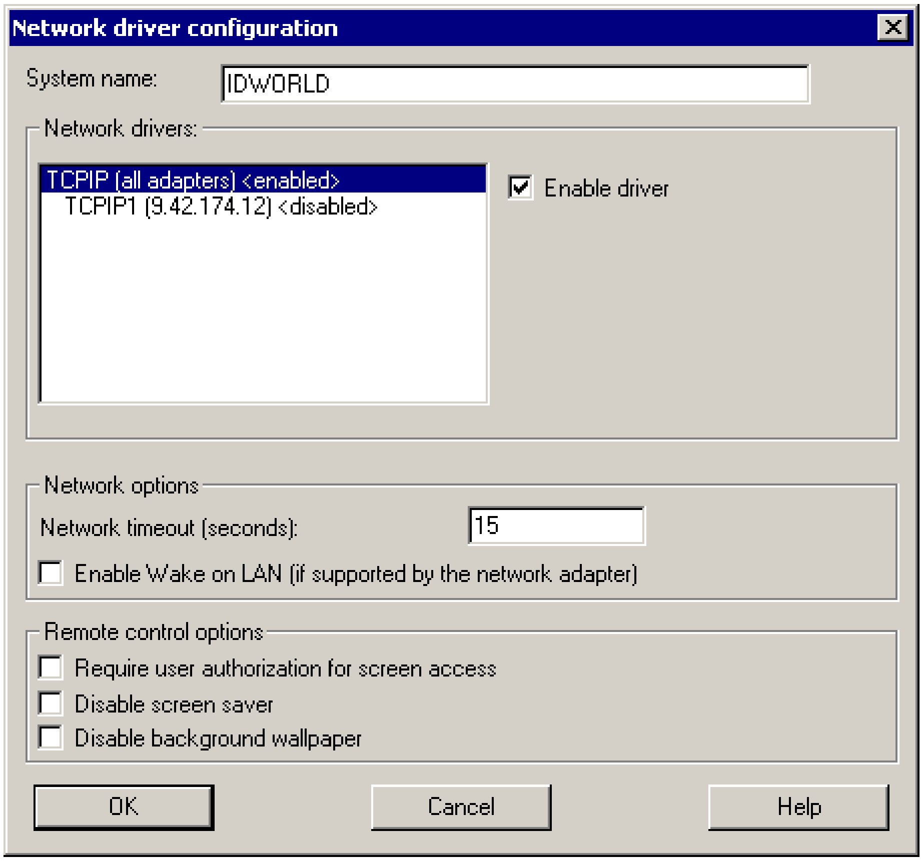
C:\Program Files\IBM\Director\SwPkInst\

Figure 33. Installing Level 2: IBM Director Agent on Windows: “Software Distribution settings” window

To select an alternative location for the storage of software-distribution packages before they are applied to IBM Director Agent, click **Change** and select another directory.

10. Click **Next**. The ″Ready to Install the Program″ window opens.
11. Click **Install**. The ″Installing IBM Director Agent″ window opens.

    The status bar indicates the progress of the installation. When the installation is completed, the “Network driver configuration” window opens.



System name: IDWORLD

Network drivers:

TCPIP (all adapters) <enabled>
TCPIP1 (9.42.174.12) <disabled>

☑ Enable driver

Network options

Network timeout (seconds): 15

☐ Enable Wake on LAN (if supported by the network adapter)

Remote control options

☐ Require user authorization for screen access
☐ Disable screen saver
☐ Disable background wallpaper

Figure 34. Installing Level 2: IBM Director Agent on Windows: "Network driver configuration" window

12. In the **System Name** field, type the name that you want to be displayed in IBM Director Console. By default, this value is the NetBIOS name of the managed system.
13. Define the communication protocols to use for communication between IBM Director Server and IBM Director Agent.
    a. In the **Network drivers** field, the TCPIP (all adapters) setting is enabled by default. To enable another protocol, select the protocol and then select the **Enable driver** check box.

       Note: If you disable the TCPIP (all adapters) setting and enable an individual device driver on a system with multiple network adapters, IBM Director Agent will receive *only* those data packets that are addressed to the individual adapter.
    b. In the **Network timeout** field, type the number of seconds that IBM Director Server waits for a response from IBM Director Agent. By default, this value is set to 15 seconds.
    c. Click **Enable Wake on LAN** if the network adapter supports the Wake on LAN feature.

       Note: To determine whether your server supports the Wake on LAN feature, see your server documentation.
14. If you chose to install the IBM Director Remote Control Agent, the following options are available:

Require User Authorization for System Access
Select this check box to request authorization from the local user before accessing the managed system remotely.

Disable Screen Saver
Select this check box to disable the screen saver when the managed system is controlled remotely.

Disable Background Wallpaper
Select this check box to disable desktop wallpaper when the managed system is controlled remotely. You might want to disable the wallpaper because complicated backgrounds can affect the performance of remote control and increase network traffic.

15. Click **OK**. The status bar displays the progress of the installation. When the installation is completed, the InstallShield Wizard Completed window opens.
16. Click **Finish**.
17. If you installed IBM Director Agent from the CD, remove the CD from the drive.
18. If you are prompted to restart your system, click **Yes**.

Performing an unattended installation of Level 2: IBM Director Agent on 32-bit Windows:

This topic describes how to perform an unattended installation of Level 2: IBM Director Agent on a system that is running 32-bit Windows.

You can perform an unattended installation of Level 2: IBM Director Agent using a response file, which provides answers to the questions that are posed by the InstallShield wizard. You can use this method to create a standard installation file that can be employed on many systems.

Complete the following steps to install Level 2: IBM Director Agent on 32-bit Windows:

1. To start the installation from a Web download, perform the following steps:
   a. Download the dir5.10_agent_windows.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Extract the contents of the dir5.10_agent_windows.zip file to a local directory.
   c. Locate and copy the diragent.rsp file. This file is in the *local*\FILES directory where *local* is the local directory to which you extracted the contents of the dir5.10_agent_windows.zip file.
   d. Go to step 3.
2. Insert the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD into the drive.
   a. If the installation program starts automatically and the "IBM Director Setup" window opens, close it.
   b. Copy the diragent.rsp file to a local directory. This file is in the director\agent\windows\i386\FILES directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
   c. Go to step 3.
3. Open the copy of the diragent.rsp file in an ASCII text editor.

4. Modify and save the diragent.rsp file with a new file name. This file follows the Windows INI file format and is fully commented.
5. Open a command prompt and change to the directory that contains the Level 2: IBM Director Agent installation file (dir5.10_agent_windows.exe).
6. From the command prompt, type the following command and press **Enter**:

   ```
   dir5.10_agent_windows.exe /s /a installationtype rsp="responsefile.rsp" option
   ```

   where:
   - /s is an optional parameter that suppresses all file extraction dialogs.
   - *installationtype* is one of the following commands:
     - unattended shows the progress of the installation but does not require any user input.
     - silent suppresses all output to the screen during installation.
   - *responsefile.rsp* is the path and name of the response file that you saved in step 4.
   - *option* is one of the following optional parameters:

   Table 118. Optional installation parameters

Parameter	What it does
waitforme	Ensures that dir5.10_agent_windows.exe process will not end until the installation of IBM Director Agent is completed
debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
verbose	Enables verbose logging

7. If you set the RebootIfRequired parameter to Y in the response file, reboot the system if prompted to do so.
8. If you installed IBM Director Agent from the CD, remove the CD from the drive.

Installing Level 2: IBM Director Agent on 64-bit Windows (Intel Itanium only)

This topic provides instructions for installing Level 2: IBM Director Agent using the InstallShield wizard on an Intel Itanium system running 64-bit Windows.

IBM Director Agent, version 5.10 for Intel Itanium systems running 64-bit Windows, is available as a Web-download only. Download the dir5.10_agent_windows64.zip file from the IBM Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.

The wizard can be used in a standard interactive mode, or you can perform an unattended installation using a response file to provide answers to the questions that the wizard poses.

Note: If Microsoft Windows Installer (MSI), version 3.0 or later is not installed on the system, it is installed during the IBM Director Agent installation. If the upgrade is necessary, the system prompts you to restart following the installation of IBM Director Agent without specifying that Microsoft Windows Installer was installed. Unless you install using the response file and set the RebootIfRequired parameter to N, you are prompted to restart whether or not the IBM Director Agent installation is completed successfully.

In addition, if you attempt to perform an administrative installation and MSI has not yet been upgraded, you must change to the directory containing the dir5.10_agent_windows64.exe file and run the installation program using the following command:

```
dir5.10_agent_windows64.exe -a admin
```

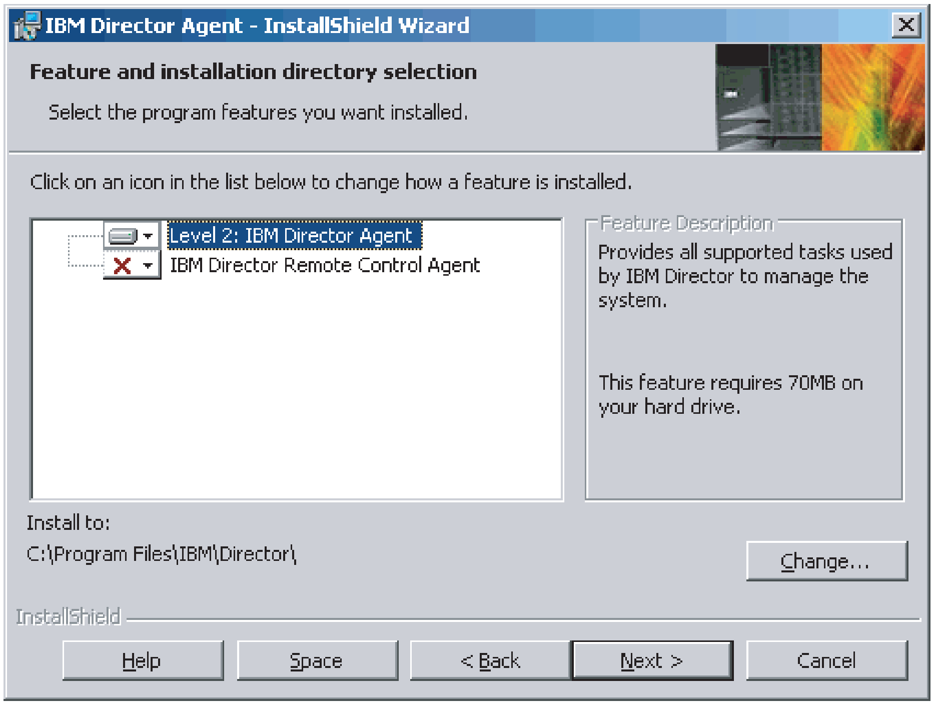
This command updates MSI and runs the installation program in administrative mode. Restart the system if prompted to do so.

Installing Level 2: IBM Director Agent on 64-bit Windows (Intel Itanium only) using the InstallShield:

This topic describes how to install Level 2: IBM Director Agent on an Intel Itanium system that is running 64-bit Windows using the InstallShield wizard.

Complete the following steps to install Level 2: IBM Director Agent on an Intel Itanium system running 64-bit Windows:

1. Download the dir5.10_agent_windows64.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
2. Extract the contents of the dir5.10_agent_windows64.zip file to a local directory.
3. Locate the dir5.10_agent_windows64.exe file. This file is in the *directory*\FILES directory, where *directory* is the local directory to which you extracted the contents of the dir5.10_agent_windows64.zip file.
4. Double-click the dir5.10_agent_windows64.exe file. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard for IBM Director Agent″ window opens.
5. Click **Next**. The ″License Agreement″ window opens.
6. Click **I accept the terms in the license agreement** and click **Next**. The “Feature and installation directory selection” window opens.



IBM Director Agent - InstallShield Wizard

Feature and installation directory selection

Select the program features you want installed.

Click on an icon in the list below to change how a feature is installed.

- Level 2: IBM Director Agent
- ✗ IBM Director Remote Control Agent

Feature Description

Provides all supported tasks used by IBM Director to manage the system.

This feature requires 70MB on your hard drive.

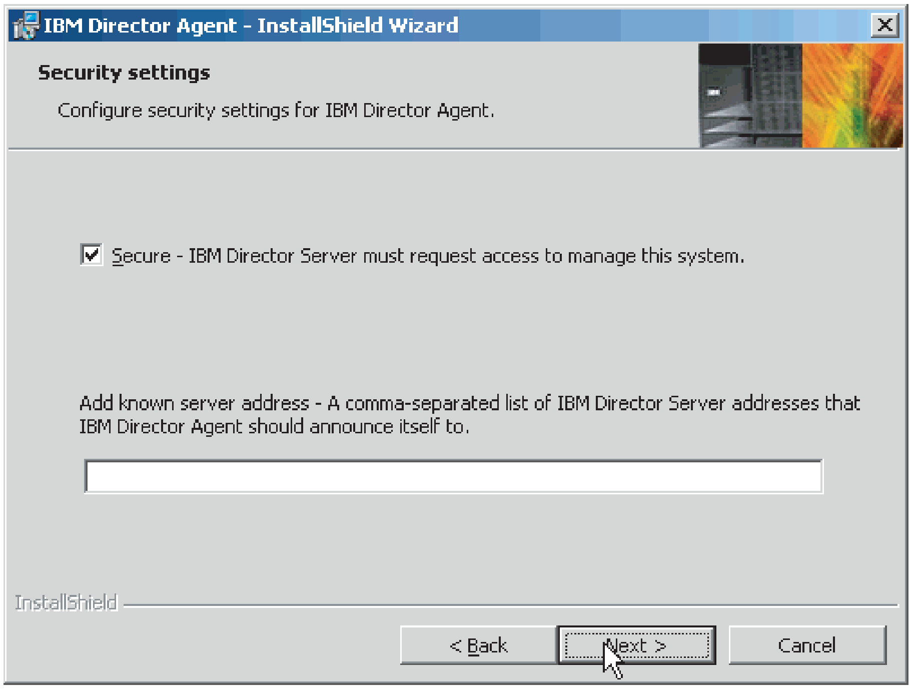
Install to:

C:\Program Files\IBM\Director\

Figure 35. Installing Level 2: IBM Director Agent on 64-bit Windows: “Feature and installation directory selection” window

Level 2: IBM Director Agent is selected automatically for installation; a hard disk drive icon ▭ is displayed to the left of the component.

7. A red X ✗ is displayed to the left of IBM Director Remote Control Agent, which is optional. The IBM Director Remote Control Agent enables a system administrator to perform remote desktop functions on the management server. To install IBM Director Remote Control Agent, click the red X to the left of the feature name. A menu opens. Click either **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.
8. Click **Next**. The “Security settings” window opens.



IBM Director Agent - InstallShield Wizard

Security settings

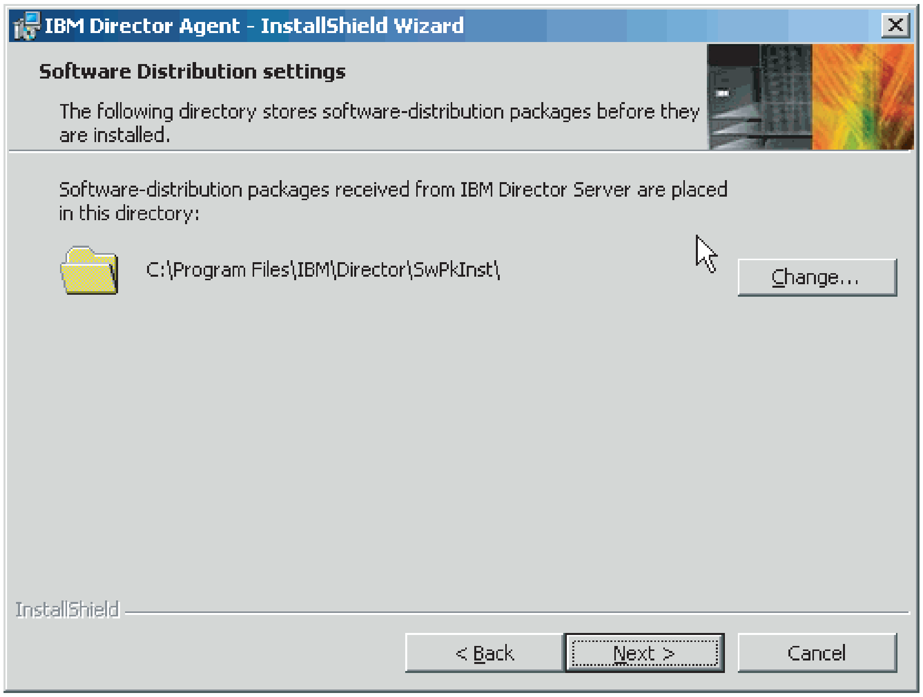
Configure security settings for IBM Director Agent.

☑ Secure - IBM Director Server must request access to manage this system.

Add known server address - A comma-separated list of IBM Director Server addresses that IBM Director Agent should announce itself to.

Figure 36. Installing Level 2: IBM Director Agent on 64-bit Windows: “Security settings” window

9. The **Secure – IBM Director Server must request access to manage this system** check box is selected by default. This setting ensures that IBM Director Server cannot manage this system until it is granted access.
10. **Optional:** Add a comma-separated list of IBM Director servers that you want IBM Director Agent to announce itself to in the **Add Known Server Address** field. The format for this field is <*protocol*>::<*address*>. For example, TCPIP::10.3.1.4, TCPIP::192.168-1.10.
11. Click **Next**. The “Software Distribution settings” window opens.


IBM Director Agent - InstallShield Wizard

Software Distribution settings

The following directory stores software-distribution packages before they are installed.

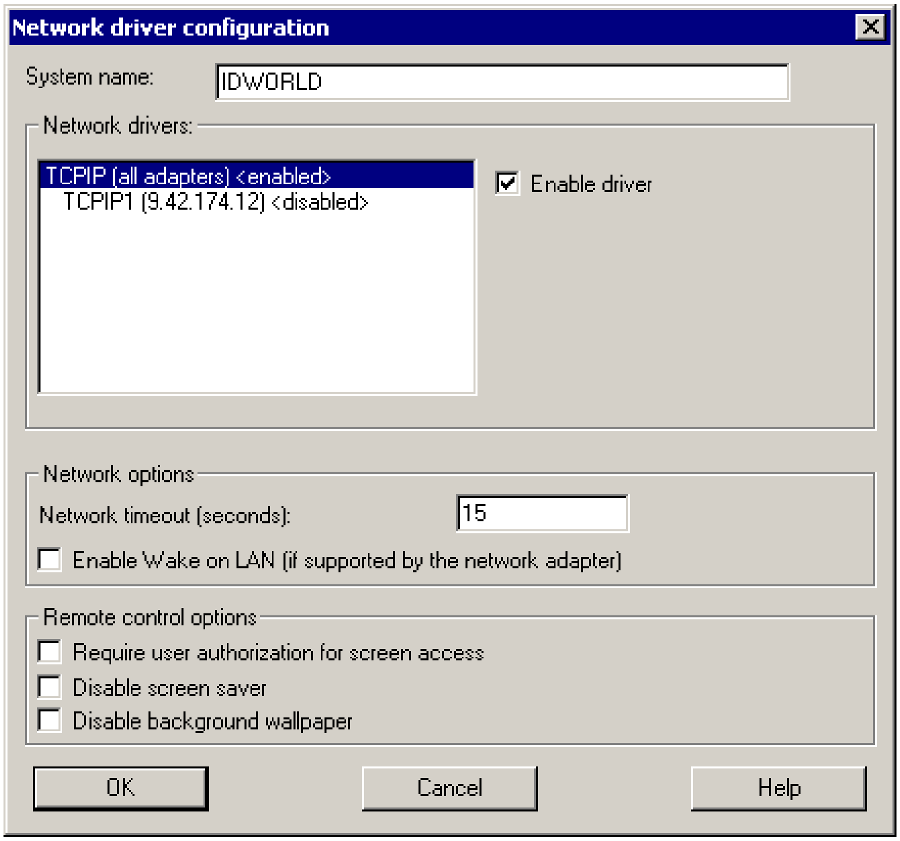
Software-distribution packages received from IBM Director Server are placed in this directory:

C:\Program Files\IBM\Director\SwPkInst\

Figure 37. Installing Level 2: IBM Director Agent on 64-bit Windows: "Software Distribution settings" window

12. To select an alternative location for the storage of software-distribution packages before they are applied to IBM Director Agent, click **Change** and select another directory.
13. Click **Next**. The ″Ready to Install the Program″ window opens.
14. Click **Install**. The ″Installing IBM Director Agent″ window opens.

    The status bar indicates the progress of the installation. When the installation is completed, the "Network driver configuration" window opens.



Network driver configuration

System name: IDWORLD

Network drivers:

TCPIP (all adapters) <enabled>

TCPIP1 (9.42.174.12) <disabled>

☑ Enable driver

Network options

Network timeout (seconds): 15

☐ Enable Wake on LAN (if supported by the network adapter)

Remote control options

☐ Require user authorization for screen access

☐ Disable screen saver

☐ Disable background wallpaper

Figure 38. Installing Level 2: IBM Director Agent on 64-bit Windows: "Network driver configuration" window

15. In the **System Name** field, type the name that you want to be displayed in IBM Director Console. By default, this name is the NetBIOS name of the managed system.
16. Define the communication protocols to use for communication between IBM Director Server and IBM Director Agent.
    a. In the **Network drivers** field, the TCPIP (all adapters) setting is enabled by default. To enable another protocol, select the protocol and then select the **Enable driver** check box.

       Note: If you disable the TCPIP (all adapters) setting and enable an individual device driver on a system with multiple network adapters, IBM Director Agent will receive *only* those data packets that are addressed to the individual adapter.
    b. In the **Network timeout** field, type the number of seconds that IBM Director Server waits for a response from IBM Director Agent. By default, this value is set to 15 seconds.
    c. Click **Enable Wake on LAN** if the network adapter supports the Wake on LAN feature.

       Note: To determine whether your server supports the Wake on LAN feature, see your server documentation.
17. If you chose to install the IBM Director Remote Control Agent, the following options are available:

Require User Authorization for System Access
Select this check box to request authorization from the local user before accessing the managed system remotely.

Disable Screen Saver
Select this check box to disable the screen saver when the managed system is controlled remotely.

Disable Background Wallpaper
Select this check box to disable desktop wallpaper when the managed system is controlled remotely. You might want to disable the wallpaper because complicated backgrounds can affect the performance of remote control and increase network traffic.

18. Click **OK**. The status bar displays the progress of the installation. When the installation is completed, the InstallShield Wizard Completed window opens.
19. Click **Finish**.
20. If you are prompted to restart your system, click **Yes**.

Performing an unattended installation of Level 2: IBM Director Agent on 64-bit Windows (Intel Itanium only):

This topic describes how to perform an unattended installation of Level 2: IBM Director Agent on an Intel Itanium system that is running 64-bit Windows.

You can perform an unattended installation of Level 2: IBM Director Agent using a response file, which provides answers to the questions that are posed by the InstallShield wizard. You can use this method to create a standard installation file that can be employed on many systems.

Complete the following steps to install Level 2: IBM Director Agent on an Intel Itanium system running 64-bit Windows:

1. Download the dir5.10_agent_windows64.zip file from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
2. Extract the contents of the dir5.10_agent_windows64.zip file to a local directory.
3. Copy the diragent.rsp file.
4. Open the copy of the diragent.rsp file in an ASCII text editor and modify the installation settings. This file follows the Windows INI file format and is fully commented.
5. Save the copy of the diragent.rsp file with a new file name.
6. Open a command prompt and change to the directory that contains the Level 2: IBM Director Agent installation file (dir5.10_agent_windows.exe).
7. From the command prompt, type the following command and press **Enter**:

   ```
   dir5.10_agent_windows64.exe /s /a installationtype rsp="responsefile.rsp" option
   ```

   where:
   - `/s` is an optional parameter that suppresses all file extraction dialogs.
   - *installationtype* is one of the following commands:
     - `unattended` shows the progress of the installation but does not require any user input.
     - `silent` suppresses all output to the screen during installation.
   - *responsefile.rsp* is the path and name of the response file that you created in step 5.

- *option* is one of the following optional parameters:

Table 119. Optional installation parameters

Parameter	What it does
waitforme	Ensures that dir5.10_agent_windows64.exe process will not end until the installation of IBM Director Agent is completed
debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
verbose	Enables verbose logging

8. If you set the RebootIfRequired parameter to Y in the response file, reboot the system if prompted to do so.

Installing IBM Director Agent using the Software Distribution task

This topic describes how to install IBM Director Agent using the Software Distribution task.

You can use the IBM Director Software Distribution task to install IBM Director Agent on managed systems running AIX, i5/OS, Linux, or Windows.

The following files describe IBM Director Agent:

- dir5.10_agent_aix.xml

  This file is located in the director/agent/aix/META-INF directory on the *IBM Director 5.10 for AIX 5L* CD.
- dir5.10_agent_linux.xml

  This file is located in the director/agent/linux/i386/META-INF directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
- dir5.10_agent_linppc.xml

  This file is located in the director/agent/linux/ppc/META-INF directory on the *IBM Director 5.10 for Linux on Power* CD.
- dir5.10_agent_windows.xml

  This file is located in the director\agent\windows\i386\META-INF directory on the *IBM Director 5.10 for Windows and Linux on xSeries* or *IBM Director 5.10 for Intel and AMD-based hardware* CD.
- Directori5OSRPD_agentpackagedIU.xml

  The default location for this file on an i5/OS management server, if you have selected to install the IBM Director Agent images, is at /QIBM/ProdData/VE2/ManagedNodes/Directori5OS/META-INF.

  If you have not installed IBM Director Server for i5/OS, this file is included on the *IBM Director Agents for AIX 5L , i5/OS, Windows, Linux on xSeries, System z9, zSeries and POWER* CD. You can access it from the \FILES\Director directory, in the Directori5OSAgent.zip file.

The following files describe the 64-bit, Intel Itanium versions of the IBM Director Agent:

- dir5.10_agent_linux64.xml
- dir5.10_agent_windows64.xml

(xSeries only) The following files describe the IBM LM78 and IBM SMBus device drivers:

- lm78driver_linux.xml
- smbdriver_linux.xml

You can download these files from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/. They are included in the .zip or .gz packages for the component or device driver to which they apply.

When you import the XML files into IBM Director, the IBM Update Assistant creates software packages. Then, you can use the IBM Director Software Distribution task to distribute the packages to the managed systems.

To install the IBM LM78 or SMBus device driver using the Software Distribution task, you first must build the binary RPM file and copy it to the same directory as the lm78driver_linux.xml or smbdriver_linux.xml file.

Note: If an earlier version of the IBM LM78 or SMBus device driver for Linux is installed on the managed system, you must uninstall the device driver before installing version 5.10 of the driver.

Related reference

"IBM LM78 and SMBus device drivers for Linux" on page 161
This topic describes when to install the LM78 and SMBus device drivers for Linux.

Creating a software package:

This topic describes how to create a software package for installing or upgrading IBM Director Agent or installing IBM Director Core Services.

Complete the following steps to create a software package:

1. Locate the installation or upgrade packages. Refer to "Installing IBM Director Core Services using the Software Distribution task" on page 228 or "Installing IBM Director Agent using the Software Distribution task" on page 258 for more information.
2. If you want to accept the default settings for the installation, go to step 3. Otherwise, copy the response file (diragent.rsp for IBM Director Agent; coresvcs.rsp for IBM Director Core Services) and open the copy in an ASCII text editor. Modify the response file as needed; then, save the modified file with a new file name.
3. Start IBM Director Console.
4. In the Tasks pane, double-click **Software Distribution**. The "Software Distribution Manager" window opens.

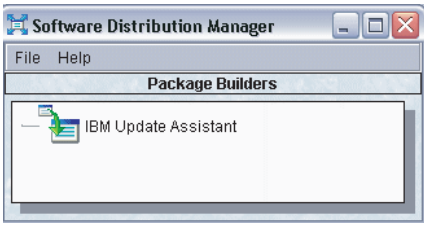


Figure 39. Creating a software package: "Software Distribution Manager" window (Standard Edition)

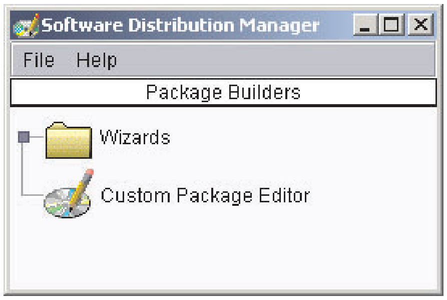
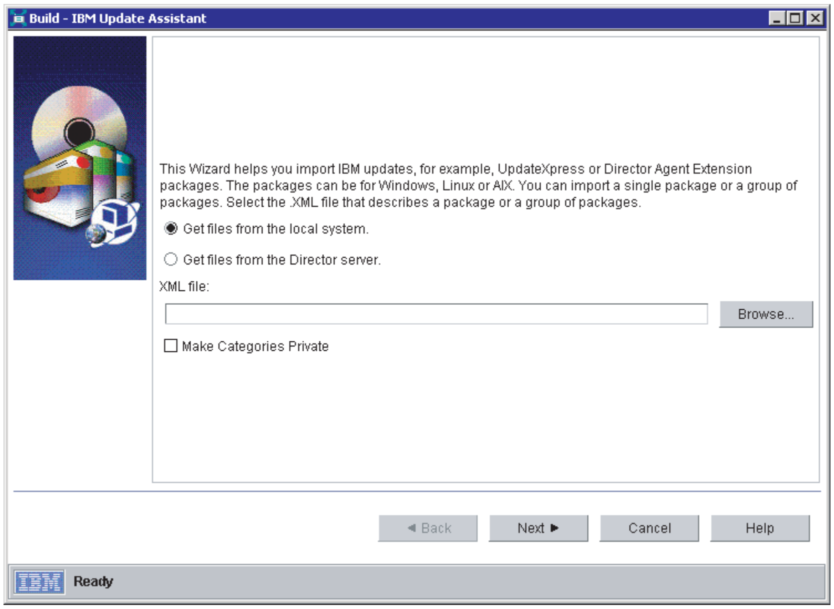


Figure 40. Creating a software package: Software Distribution Manager window (Premium Edition)

5. If you have not installed IBM Director 5.10 Software Distribution (Premium Edition), go to step 6. Otherwise, expand the **Wizards** tree.
6. Double-click **IBM Update Assistant**. The "IBM Update Assistant" window opens.



This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

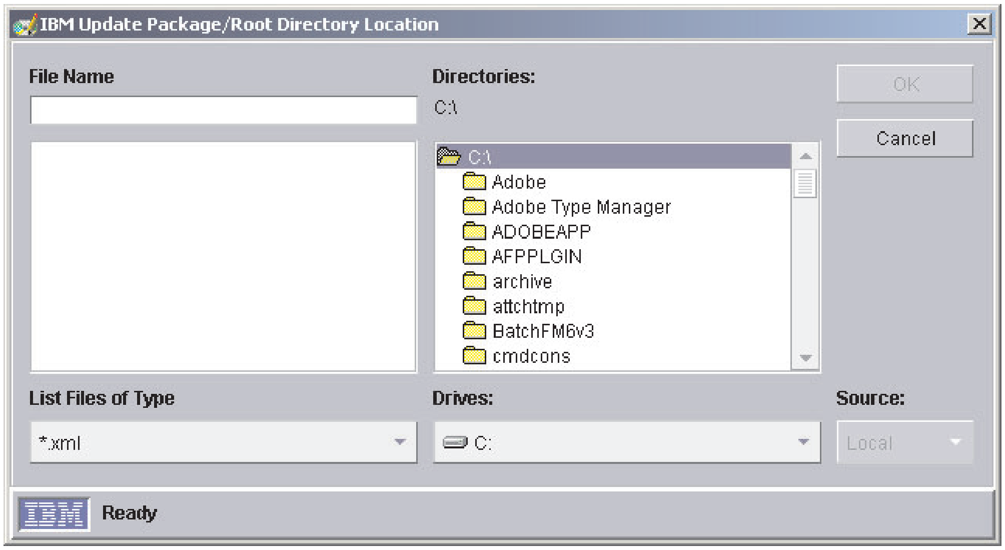
○ Get files from the Director server.

XML file:

Figure 41. Creating a software package: "IBM Update Assistant" window

7. If you want to get files from the management server, click **Get files from the Director server**. By default, **Get files from the local system** is selected.

8. To select a file, click **Browse**. The "IBM Update Package/Root Directory Location" window opens.



File Name:

Directories: C:\

C:\
Adobe
Adobe Type Manager
ADOBEAPP
AFPPLGIN
archive
attchtmp
BatchFM6v3
cmdcons

List Files of Type: *.xml

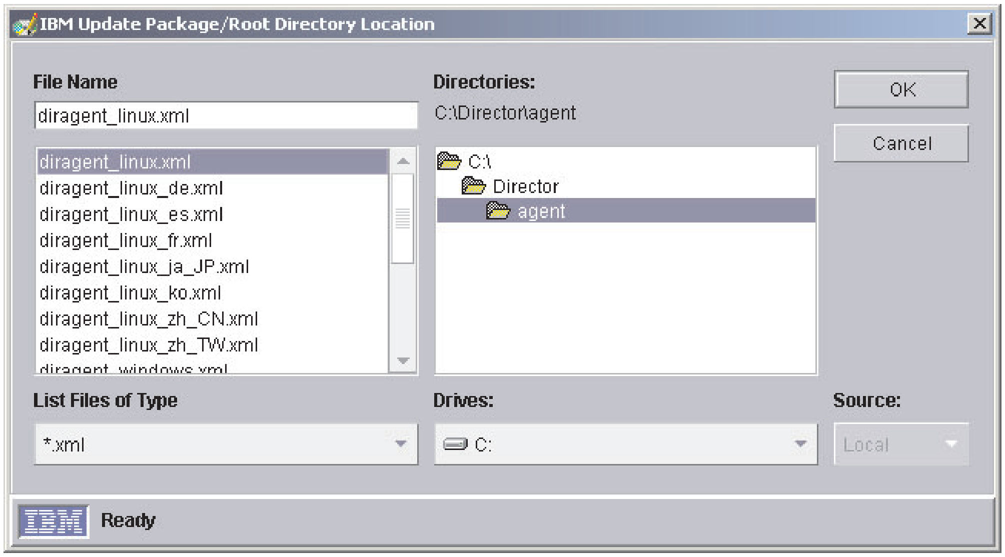
Drives: C:

Source: Local

Figure 42. Creating a software package: "IBM Update Package/Root Directory Location" window

9. Locate the appropriate XML file and click it. The name of the XML file is displayed in the **File Name** field.

Note: Use the correct XML file for your language. The correct file for English installations is the one without the language code. For example, dir5.10_agent_windows.xml



File Name: diragent_linux.xml

diragent_linux.xml
diragent_linux_de.xml
diragent_linux_es.xml
diragent_linux_fr.xml
diragent_linux_ja_JP.xml
diragent_linux_ko.xml
diragent_linux_zh_CN.xml
diragent_linux_zh_TW.xml
diragent_windows.xml

Directories: C:\Director\agent

C:\
Director
agent

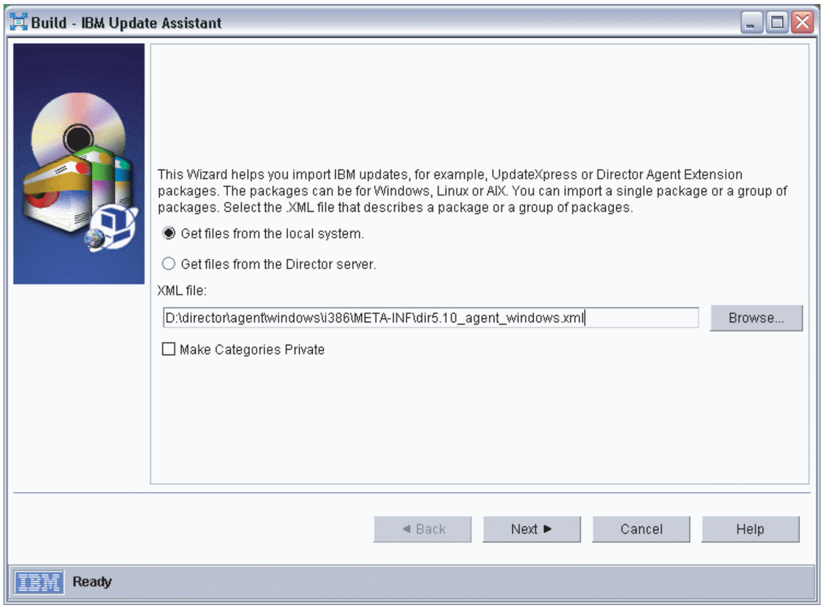
List Files of Type: *.xml

Drives: C:

Source: Local

Figure 43. Creating a software package: "IBM Update Package/Root Directory Location" window

10. Click **OK**. The "IBM Update Assistant" window reopens.



This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

○ Get files from the Director server.

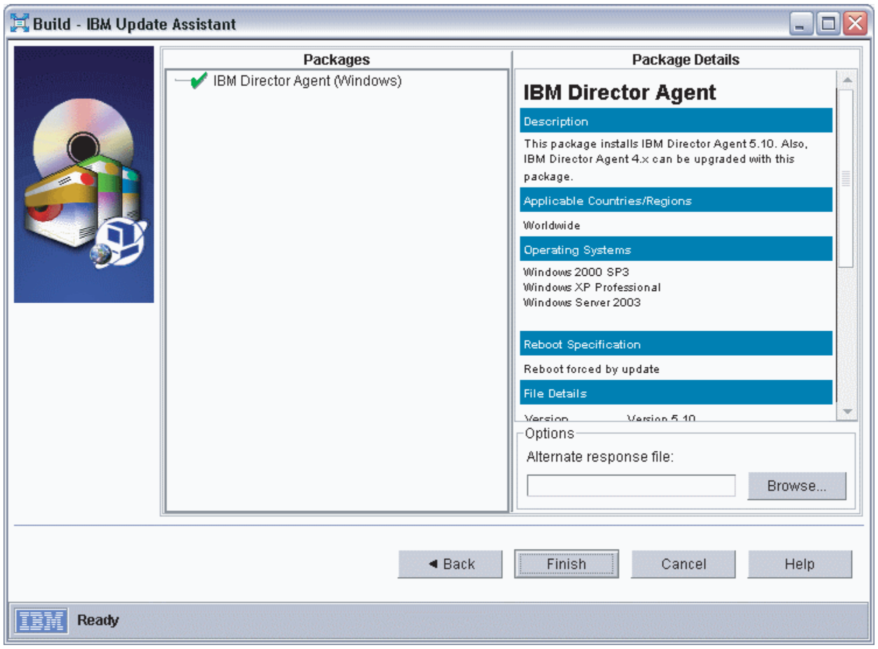
XML file:

D:\director\agent\windows\i386\META-INF\dir5.10_agent_windows.xml

□ Make Categories Private

Figure 44. Creating a software package: "IBM Update Assistant" window

11. Click **Next**. The second "IBM Update Assistant" window opens.



✓ IBM Director Agent (Windows)

IBM Director Agent

Description

This package installs IBM Director Agent 5.10. Also, IBM Director Agent 4.x can be upgraded with this package.

Applicable Countries/Regions

Worldwide

Operating Systems

Windows 2000 SP3
Windows XP Professional
Windows Server 2003

Reboot Specification

Reboot forced by update

File Details

Version Version 5.10

Alternate response file:

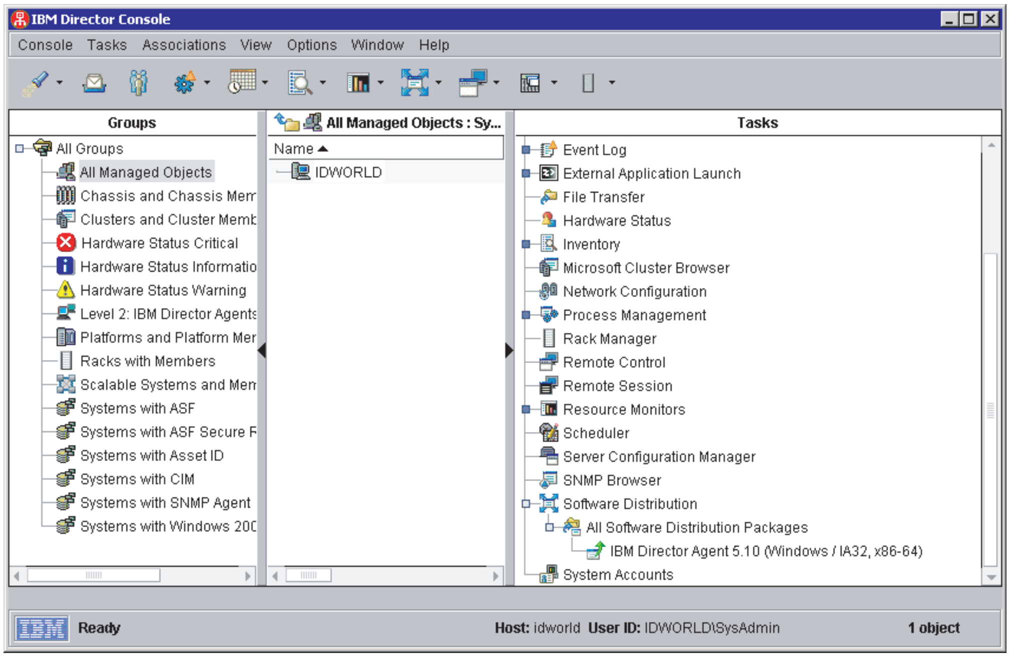
Figure 45. Creating software packages: "IBM Update Assistant" window

12. To specify an alternative response file, click **Browse** and locate the file that you modified in step 2 on page 259.

    Note: If you do not specify an alternative response file, the package is installed with the default settings that are specified in the installation script.

13. Click **Finish**. As the package is processed, a status message is displayed at the bottom of the window.

When the processing is completed, the software-distribution package is displayed in the Tasks pane of IBM Director Console.



Host: idworld **User ID:** IDWORLD\SysAdmin **1 object**

Figure 46. All Software Distribution Packages: IBM Director Agent Upgrade

Installing a software package:

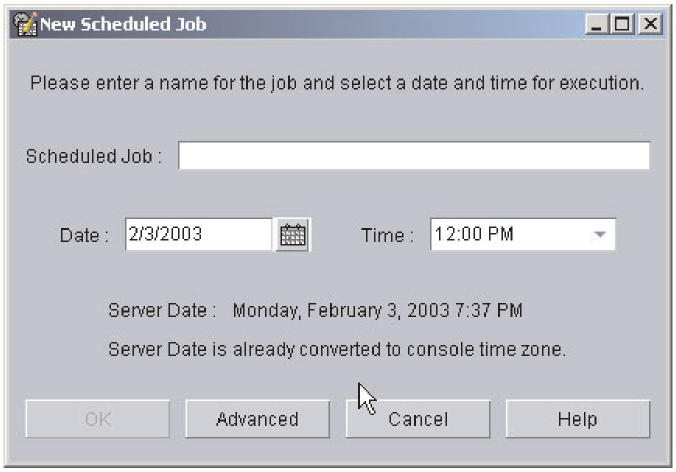
This topic describes how to install a software package using IBM Director.

Note: The Software Distribution task copies the installation package to the client system before starting the installation. On systems running AIX, the package is copied to the root file system. There must be at least 60 MB of free space available in the root file system or the task will fail.

Complete the following steps to install a software package:

1. Start IBM Director Console.
2. In the Tasks pane, expand the Software Distribution task.
3. Click the software package that you want to distribute. Then, drag it into the Group Contents pane and drop it onto the icon that is displayed for the system on which you want to install the software package. A window opens.

   Note: To distribute software to several systems at once, you can drag the software package into the Groups pane and drop it onto the icon for the group. Alternatively, you can select multiple managed systems in the Group Contents pane.
4. When prompted with `Do you wish to create a scheduled job for this task or execute immediately?`, click **Schedule** or **Execute Now**. If you click **Execute Now**, the software package is distributed immediately. If you click **Schedule**, the "New Scheduled Job" window opens.



New Scheduled Job

Please enter a name for the job and select a date and time for execution.

Scheduled Job :

Date : 2/3/2003

Time : 12:00 PM

Server Date : Monday, February 3, 2003 7:37 PM

Server Date is already converted to console time zone.

Figure 47. Scheduling the installation of a software package: "New Scheduled Job" window

5. Schedule the job:
   a. In the **Scheduled Job** field, type a unique name for the job. This name is displayed in the Jobs pane of the Scheduler window.
   b. In the **Date** field, type the day you want the software package to be installed (in MM/DD/YYYY format).
   c. In the **Time** field, type the time you want the software package to be installed.

   For more information about the Scheduler task, see the *IBM Director 5.10 Systems Management Guide*.
6. Click **OK**. The Save Job Confirmation window opens.
7. Click **OK**.

Installing IBM Director extensions

This topic describes procedures for installing IBM Director extensions.

Downloading extensions for IBM Director

This topic describes procedures for obtaining extensions for IBM Director on the IBM Director Web site at ibm.com.

To obtain IBM Director extensions from the IBM Director Web site, you need a high-speed Internet connection.

Some extensions must be purchased separately for IBM Director. The following extensions are free and available for downloading from the IBM Director Web site:

ServeRAID Manager
: Configure, monitor, and maintain ServeRAID adapters or controllers that are installed locally or remotely on servers. You can view information that is related to controllers, arrays, logical drives, hot-spare drives, and hard disk drives. Also, you can view configuration settings and events and locate defunct hard disk drives.

System Availability

Analyze the availability of a managed system or group. You can view statistics about managed-system uptime and downtime through reports and graphical representations.

Web-based Access

View managed system information, change alert standard format (ASF) alerts, change system settings and configurations, and more. When you install Web-based Access on a managed system, you can access IBM Director Agent and view real-time asset and health information about the managed system from a Web browser. This feature is supported only on Windows 32-bit operating systems.

Installation instructions for the Web-based Access extension are included in *IBM Director Web-based Access Installation and User's Guide*.

z/VM Center

Provisions Linux systems on virtual hardware that is based on real System z9 and zSeries hardware and the z/VM hypervisor.

Note: To be able to use z/VM Center, you must purchase the IBM Director Extensions, V5.10 feature of IBM Virtualization Engine and Infrastructure Services for Linux on System z9 and zSeries, V2.1.

The following extension is free and available for downloading from the IBM Electronic Service Agent™ Web site (www.ibm.com/support/electronic/):

Electronic Service Agent

Monitor your xSeries servers and @server BladeCenter products for hardware errors. Hardware errors that meet certain criteria are reported to IBM. Electronic Service Agent also administers hardware and software inventory collections, and reports inventory changes to IBM. All information sent to IBM is stored in a secure IBM database and used for improved problem determination.

Installation instructions for the Electronic Service Agent extension are included in release notes available on the Electronic Service Agent Web site.

The following extension is free and available for downloading from the IBM Virtual Machine Manager Web site:

Virtual Machine Manager

Manage both physical and virtual machines from a single console. With Virtual Machine Manager (VMM), you can manage both VMware ESX Server and Microsoft Virtual Server environments using IBM Director. VMM also integrates VMware VirtualCenter and IBM Director for advanced virtual machine management.

Installation instructions for the Virtual Machine Manager extension are included in *IBM Virtual Machine Manager Installation and User's Guide*, available on the Virtual Machine Manager Web site.

Use the following procedure to download extensions for IBM Director:

1. In a Web browser, navigate to one of the following Web sites:

Option	Description
To download the Electronic Service Agent extension	www.ibm.com/support/electronic/
To download the Virtual Machine Manager extension	www.ibm.com/servers/eserver/xseries/systems_management/xseries_sm/vmm.html
To download all other extensions	www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/

2. Navigate to the desired extension on your operating system, and download the extension files to a temporary directory.

Review any readme files that are associated with the extension, and proceed with installation as directed.

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" on page 267
Linux server	"Installing Capacity Manager on a Linux server" on page 267

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 268
Linux console	"Installing Capacity Manager on a Linux console" on page 269

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 270
Linux systems (32-bit)	"Installing Capacity Manager on a managed 32-bit Linux system" on page 271

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`

Installation scenario	Command
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.

Installing ServeRAID Manager

This topic describes the general procedure for installing the ServeRAID Manager extension for IBM Director 5.10.

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

1. Download the ServeRAID Manager extension.
   a. In a Web browser, navigate to the following Web site: www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
   b. Navigate to the ServeRAID Manager extension for your operating system, and download the extension files to a temporary directory.
2. Install ServeRAID Manager on the management server.

Option	Description
Windows server	"Installing the ServeRAID Manager extension on a Windows server" on page 273
Linux server	"Installing the ServeRAID Manager extension on a Linux server" on page 274

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

Option	Description
Windows console	"Installing the ServeRAID Manager extension on a Windows console" on page 276
Linux console	"Installing the ServeRAID Manager extension on a Linux console" on page 276

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

4. Install ServeRAID Manager components for IBM Director Agent on managed systems.

Option	Description
Windows systems	"Installing the ServeRAID Manager extension on a managed Windows system" on page 277
Linux systems	"Installing the ServeRAID Manager extension on a managed Linux system" on page 278

Option	Description
NetWare systems	“Installing the ServeRAID Manager extension on a managed NetWare system” on page 279

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

Installing the ServeRAID Manager extension on a Windows server:

This topic describes the procedure for installing the ServeRAID Manager extension for IBM Director on a Windows management server.

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

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close all applications, including any command-prompt windows.
3. Click **Start** → **Run**.
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\raid\server\windows\serveraid_5.10_server_windows.exe
   ```

   download represents the location to which the ServeRAID Manager download package was unzipped.
5. In the first panel of the ServeRAID Manager Server InstallShield Wizard, click **Next**.
6. In the second panel of the ServeRAID Manager Server InstallShield Wizard, complete the following steps:
   a. Ensure that the hard disk drive icon 🖴▾ appears to the left of ServeRAID Manager Server in the list box. If a different icon appears, click the icon and select **This feature, and all subfeatures, will be installed on local hard drive** from the menu.
   b. Ensure that the hard disk drive icon 🖴▾ appears to the left of each of the other features you wish to install. You can install the ServeRAID Manager Agent, ServeRAID Manager Console, and IBM Management Station along with ServeRAID Manager Server.
   c. Click **Next**.
7. (Only if Management Station is being installed) In the next panel of the ServeRAID Manager Server InstallShield Wizard, complete the following steps:
   a. Type the user name and password (enter twice for confirmation) for the user for the ServeRAID Management Station service.
   b. Click **Next**.
8. In the next panel of the ServeRAID Manager Server InstallShield Wizard, click **Install**. A new panel displays the installation progress.
9. When installation has completed, click **Finish**.

10. In the dialog that appears, respond to the prompt to reboot the management server. Click **Yes** to reboot immediately, or click **No** if you will reboot the management server yourself.

The management server must be rebooted before the ServeRAID Manager extension will operate. After installing the server components of the ServeRAID Manager extension, you need to install the console components.

Installing the ServeRAID Manager extension on a Linux server:

This topic describes the procedure for installing ServeRAID Manager on a Linux management server.

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

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation. The downloaded installation files are contained in a tar file. Use the tar -x command to extract the contents to a temporary directory.
2. Stop IBM Director. From a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
3. Change to the directory in which the installation package is located. Type the following command and press **Enter**:
   ```
   cd /download/raid/server/linux/
   ```

   download represents the location into which the ServeRAID Manager download package was extracted.
4. **Optional:** To install the management station service on the Linux management server, perform the following substeps.

   The management station is used to administer IBM System Storage DS300 and IBM System Storage DS400 devices. This step is only necessary if *both* of the following conditions are true:
   - You wish to manage IBM System Storage DS300 and IBM System Storage DS400 devices using IBM Director
   - You do not have the standalone version of ServeRAID Manager installed

   If either of these conditions is not met, there is no need to install the management station service.

   Note: Although it is possible to install the management station service on a system other than that on which IBM Director Server is installed, this is not a recommended configuration, and is not documented here. To use the standalone version of ServeRAID Manager, or for instructions for installing the management station service on a different system than the management server on which IBM Director Server is installed, refer to the documentation and downloads available on the ServeRAID Web site at www.ibm.com/pc/support/site.wss/MIGR-495PES.html.

   a. List the directory contents. There should be several files named `serveraid-mgmt-`*`version`*`-`*`build`*`.`*`os`*`.i586.rpm`, with *`version`*, *`build`*, and *`os`* indicating the version number, build number, and operating system for the package. Note the *`version`* and *`build`* numbers for the following step.

   b. Type one of the following commands (substituting the actual values for *`version`* and *`build`*) and press **Enter**:

Installation scenario	Command
Performing a new installation on Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 3 required)	`rpm -ivh serveraid-mgmt-`*`version-build`*`.rhel33.i586.rpm`
Upgrading from a previous version on Red Hat Enterprise Linux AS, ES, and WS, version 3.0 (Update 3 required)	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director serveraid-mgmt-`*`version-build`*`.rhel33.i586.rpm`
Performing a new installation on Red Hat Enterprise Linux AS, ES, and WS, version 4.0	`rpm -ivh serveraid-mgmt-`*`version-build`*`.rhel4.i586.rpm`
Upgrading from a previous version on Red Hat Enterprise Linux AS, ES, and WS, version 4.0	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director serveraid-mgmt-`*`version-build`*`.rhel4.i586.rpm`
Performing a new installation on SUSE LINUX Enterprise Server 8	`rpm -ivh serveraid-mgmt-`*`version-build`*`.sles8.i586.rpm`
Upgrading from a previous version on SUSE LINUX Enterprise Server 8	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director serveraid-mgmt-`*`version-build`*`.sles8.i586.rpm`
Performing a new installation on SUSE LINUX Enterprise Server 9	`rpm -ivh serveraid-mgmt-`*`version-build`*`.sles9.i586.rpm`
Upgrading from a previous version on SUSE LINUX Enterprise Server 9	`rpm -Uvh --relocate /opt/ibm/director=/opt/IBM/director serveraid-mgmt-`*`version-build`*`.sles9.i586.rpm`

The installation progress is displayed.

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

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

The installation progress is displayed.

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

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

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

The management server must be rebooted before the ServeRAID Manager extension will operate. After installing the server components of the ServeRAID Manager extension, you need to install the console components.

Installing the ServeRAID Manager extension on a Windows console:

This topic describes the procedure for installing the ServeRAID Manager extension on a Windows management console.

The ServeRAID Manager extension should be installed on the management server before installing the console components of ServeRAID Manager.

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

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console.
3. Click **Start** → **Run**.
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\raid\console\windows\serveraid_5.10_console_windows.exe
   ```

   download represents the location into which the ServeRAID Manager download package was unzipped.
5. In the first panel of the ServeRAID Manager Console InstallShield Wizard, click **Next**.
6. In the second panel of the ServeRAID Manager Console InstallShield Wizard, complete the following steps:
   a. Ensure that the hard disk drive icon appears to the left of ServeRAID Manager Console in the list box. If a different icon appears, click the icon and select **This feature, and all subfeatures, will be installed on local hard drive** from the menu.
   b. Click **Next**.
7. In the third panel of the ServeRAID Manager Console InstallShield Wizard, click **Install**. A new panel displays the installation progress.
8. When installation has completed, click **Finish**.
9. Restart IBM Director Console.

After installing the console components of the extension, you need to install the ServeRAID Manager Agent components on your managed systems.

Installing the ServeRAID Manager extension on a Linux console:

This topic describes the procedure for installing ServeRAID Manager on a Linux management console.

The ServeRAID Manager extension should be installed on the management server before installing the console components of ServeRAID Manager.

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

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

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console.
3. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /download/raid/console/linux/
   ```

   download represents the location to which the ServeRAID Manager download package was extracted.
4. Type one of the following commands and press **Enter**:

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

   The installation progress is displayed.
5. Restart IBM Director Console.
6. Remove the CD from the CD-ROM drive.

After installing the console components of the extension, you need to install the ServeRAID Manager Agent components on your managed systems.

Installing the ServeRAID Manager extension on a managed Windows system:

This topic describes the procedure for installing ServeRAID Manager on a Windows managed system.

The following prerequisites apply to this installation:

- ServeRAID Manager should be installed on the management server and management console before installing the agent components of ServeRAID Manager on managed systems.
- IBM Director Agent should be installed on the managed system before installing ServeRAID Manager.

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 ServeRAID Manager on a Windows managed system:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation. The downloaded installation files are contained in a zip file. Use the unzip command to extract the contents to a temporary directory.
2. Click **Start** → **Run**.
3. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\raid\agent\windows\serveraid_5.10_agent_windows.exe
   ```

download represents the location to which the ServeRAID Manager download package was extracted.

4. In the first panel of the ServeRAID Manager Agent InstallShield Wizard, click **Next**.
5. In the second panel of the ServeRAID Manager Agent InstallShield Wizard, complete the following steps:
   a. Ensure that the hard disk drive icon appears to the left of ServeRAID Manager Agent in the list box. If a different icon appears, click the icon and select **This feature, and all subfeatures, will be installed on local hard drive** from the menu.
   b. Click **Next**.
6. In the third panel of the ServeRAID Manager Agent InstallShield Wizard, click **Install**. A new panel displays the installation progress.
7. When installation has completed, click **Finish**.
8. In the dialog that appears, respond to the prompt to reboot the managed system. Click **Yes** to reboot immediately, or click **No** if you will reboot the managed system yourself.

You must reboot the managed system before the ServeRAID Manager Agent will operate.

Installing the ServeRAID Manager extension on a managed Linux system:

This topic describes the procedure for installing ServeRAID Manager on a Linux managed system.

The following prerequisites apply to this installation:

- ServeRAID Manager should be installed on the management server and management console before installing the agent components of ServeRAID Manager on managed systems.
- IBM Director Agent should be installed on the managed system before installing ServeRAID Manager.

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 ServeRAID Manager on a Linux managed system:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation. The downloaded installation files are contained in a tar file. Use the tar -x command to extract the contents to a temporary directory.
2. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /download/raid/agent/linux/
   ```

   download represents the location to which the ServeRAID Manager download package was extracted.

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

Installation scenario	Command
Performing a new installation (32-bit agent)	`rpm -ivhRAIDLxAg-5.10-1.i386.rpm`
Performing a new installation (64-bit agent for Opteron or EM64T)	`rpm -ivhRAIDLxAg-5.10-1.x86_64.rpm`

Upgrading from a previous version (32-bit agent)	`rpm -Uvh --relocate`
	`/opt/ibm/director=/opt/IBM/director`
	`RAIDLxAg-5.10-1.i386.rpm`

Upgrading from a previous version (64-bit agent for Opteron or EM64T)	`rpm -Uvh --relocate`
	`/opt/ibm/director=/opt/IBM/director`
	`RAIDLxAg-5.10-1.x86_64.rpm`

   The installation progress is displayed.

You must reboot the managed system before the ServeRAID Manager Agent will operate.

Installing the ServeRAID Manager extension on a managed NetWare system:

This topic describes the procedure for installing the ServeRAID Manager extension on a NetWare managed system.

- The ServeRAID Manager extension should be installed on the management server and management console before installing the agent components of the ServeRAID Manager extension on managed systems.
- IBM Director Agent should be installed on the managed system before installing the ServeRAID Manager extension.

Note: To install the ServeRAID Manager extension, you must log on to the NetWare server from a Windows workstation running the NetWare Client for Windows. The SYS volume must be mapped as a drive to the system running Windows. Also, you must have administrator or supervisor access on the NetWare server.

Complete the following steps on the Windows workstation running NetWare Client for Windows to install the ServeRAID Manager extension on a NetWare managed system:

1. Copy the downloaded installation files to a temporary directory on the Windows workstation on which you will be performing the installation.
2. Click **Start** → **Run**.
3. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\raid\agent\windows\serveraid_5.10_agent_netware.exe
   ```

   download represents the location to which the ServeRAID Manager extension download package was saved.
4. If prompted for the language, select a language from the dropdown list and click **OK**.
5. In the first panel of the IBM ServeRAID Manager Agent 5.10 Setup Wizard, click **Next**.
6. In the second panel of the IBM ServeRAID Manager Agent 5.10 Setup Wizard, complete the following steps:

   a. Select the mapped NetWare drive on which to install ServeRAID Manager extension Agent.
   b. Click **Next**.
7. In the third panel of the ServeRAID Manager extension Agent InstallShield Wizard, click **Install**.

   Note: ServeRAID Manager Agent is the only component in the list of components to be installed, and should already be selected.

   A new panel displays the installation progress.
8. When installation has completed, click **Finish**.

Installing Software Distribution (Premium Edition)

This topic describes procedures for installing Software Distribution (Premium Edition) on management servers running AIX, i5/OS, Linux, and Windows.

Installing Software Distribution on AIX:

This topic describes how to install Software Distribution (Premium Edition) on an AIX management server.

To install Software Distribution on the management server running AIX, perform the following steps on the management server:

1. Stop IBM Director Server. From a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
2. Insert the *IBM Director 5.10 Software Distribution Premium Edition* CD into the CD-ROM drive.
3. Mount the CD-ROM drive. Perform the following steps to mount the CD-ROM drive:

   Note: For the following steps, *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.
   a. If the CD-ROM automounts, type the following command and press **Enter**:
      ```
      umount /mnt/cdrom
      ```
   b. Type the following command and press **Enter**:
      ```
      mount /dev/cdrom /mnt/cdrom
      ```
4. Change to the directory in which the installation key is located. Type the following command and press **Enter**:
   ```
   cd /mnt/cdrom/swdist/server/aix/
   ```
5. Type the following command and press **Enter**:
   ```
   ./install
   ```
6. Remove the CD from the CD-ROM drive.
7. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstart
   ```

No further installation is required on managed systems or management consoles.

Installing Software Distribution on i5/OS:

This topic describes how to install Software Distribution (Premium Edition) on an i5/OS management server.

To install Software Distribution on the management server running i5/OS, perform the following steps on a computer that has a drive mapped to the management server:

1. Insert the *IBM Director 5.10 Software Distribution Premium Edition* CD into the CD-ROM drive.
2. Change to the directory in which the installation package is located. The installation package is in the `/swdist/server/os400` directory on the CD-ROM.
3. Copy the contents of the `/swdist/server/os400` directory on the CD-ROM to the `/qibm/proddata/director/bin/` directory on the management server.
4. Remove the CD from the CD-ROM drive.
5. Open a Qshell command prompt on the management server and type the following commands. Press **Enter** after each command and wait for the previous action to complete before entering the next command.

   ```
   cd /qibm/proddata/director/bin
   install
   twgend
   twgstart
   ```

   This step installs the Software Distribution extension and shuts down and restarts IBM Director Server.

Software Distribution is installed. No further installation is required on managed systems or management consoles.

Installing Software Distribution on Linux:

This topic describes how to install Software Distribution (Premium Edition) on a Linux management server.

Complete the following steps to install Software Distribution on the management server:

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

   ```
   /opt/ibm/director/bin/twgstop
   ```
2. Insert the *IBM Director 5.10 Software Distribution Premium Edition* 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 script is located. Type one of the following commands and press **Enter**:

Option	Description
Linux on POWER	`cd /mnt/cdrom/swdist/server/linux/ppc/`
Linux on xSeries	`cd /mnt/cdrom/swdist/server/linux/i386/`
Linux on System z9 and zSeries	`cd /mnt/cdrom/swdist/server/linux/s390/`

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

   ```
   ./install
   ```
6. Remove the CD from the CD-ROM drive.
7. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:

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

No further installation is required on managed systems or management consoles.

Installing Software Distribution on Windows:

This topic describes how to install Software Distribution (Premium Edition) on a Windows management server.

Complete the following steps to install Software Distribution on a Windows management server:

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

   ```
   net stop twgipc
   ```

   Wait until the service stops.
2. Close all applications, including any command-prompt windows.
3. Insert the *IBM Director 5.10 Software Distribution Premium Edition* CD into the CD-ROM drive.
4. Click **Start** → **Run**.
5. In the Run dialog, type the following command in the **Open** field and press **Enter**:

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

   d represents the drive letter of the CD-ROM drive.
6. In the first panel of the InstallShield wizard, click **Next**.
7. In the second panel of the InstallShield wizard, click **Yes** to accept the license agreement.
8. In the Start Copying Files panel of the InstallShield wizard, click **Next**.
9. In the InstallShield Wizard Completed panel, click **Finish**.
10. Remove the CD from the CD-ROM drive.
11. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:

    ```
    net start twgipc
    ```

Software Distribution is installed. No further installation is required on managed systems or management consoles.

Installing System Availability

This topic describes the general procedure for installing the System Availability extension for IBM Director 5.10.

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

1. Download the System Availability extension.

a. In a Web browser, navigate to the following Web site: www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/.
b. Navigate to the System Availability extension for your operating system, and download the extension files to a temporary directory.

2. Install System Availability on the management server.

Option	Description
Windows server	"Installing System Availability on a Windows server"
Linux server	"Installing System Availability on a Linux server" on page 284

3. **Optional:** Install System Availability user-interface components for IBM Director Console on remote management consoles.

Option	Description
Windows console	"Installing the System Availability extension on a Windows console" on page 284
Linux console	"Installing the System Availability extension on a Linux console" on page 285

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

4. Install System Availability components for IBM Director Agent on managed systems.

Option	Description
Windows systems	"Installing the System Availability extension on a managed Windows system" on page 286
Linux systems	"Installing the System Availability extension on a managed Linux system" on page 287

Note: System Availability agent components are automatically installed on the management server when the System Availability server components are installed. It is not necessary or possible to separately install System Availability agent components on a management server.

Installing System Availability on a Windows server:

This topic describes the procedure for installing the System Availability extension for IBM Director on a Windows management server.

Complete the following steps to install System Availability on a Windows management server:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close all applications, including any command-prompt windows.

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

   ```
   download\dir5.10_sysavailserver_windows.exe
   ```

   download represents the location into which the download package was saved.
5. In the first panel of the System Availability Server InstallShield Wizard, click **Next**.
6. In the second panel of the System Availability Server InstallShield Wizard, select **I accept the terms in the license agreement**, then click **Next**.
7. In the third panel of the System Availability Server InstallShield Wizard, click **Install**. A new panel displays the installation progress.
8. When installation has completed, click **Finish**.

Installing System Availability on a Linux server:

This topic describes the procedure for installing System Availability on a Linux management server.

System Availability can only be installed on management servers running Linux for xSeries.

Complete the following steps to install System Availability on a Linux management server:
1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Stop IBM Director Server. From a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstop
   ```
3. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /download/
   ```

   download represents the location to which the download package was saved.
4. Type one of the following commands and press **Enter**:

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

   The installation progress is displayed.
5. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:

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

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

Installing the System Availability extension on a Windows console:

This topic describes the procedure for installing System Availability on a Windows management console.

System Availability should be installed on the management server before installing the console components of System Availability.

Complete the following steps to install System Availability on a Windows management console:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console.
3. Click **Start** → **Run**.
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\dir5.10_sysavailconsole_windows.exe
   ```

   download represents the location to which the System Availability download package was saved.
5. In the first panel of the System Availability Console InstallShield Wizard, click **Next**.
6. In the second panel of the System Availability Console InstallShield Wizard, select **I accept the terms in the license agreement**, then click **Next**.
7. In the third panel of the System Availability Console InstallShield Wizard, click **Install**. A new panel displays the installation progress.
8. When installation has completed, click **Finish**.
9. Restart IBM Director Console.

After installing the console components of the extension, you need to install the System Availability Agent components on your managed systems.

Installing the System Availability extension on a Linux console:

This topic describes installation procedures for System Availability on a Linux management console.

System Availability should be installed on the management server before installing the console components of System Availability.

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

Complete the following steps to install System Availability on a Linux console:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console.
3. Change to the directory in which the installation package is located. Type the following command and press **Enter**:

   ```
   cd /download/
   ```

download represents the location to which the System Availability download package was saved.

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

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

   The installation progress is displayed.

5. Restart IBM Director Console.

After installing the console components of the extension, you need to install the System Availability Agent components on your managed systems.

Installing the System Availability extension on a managed Windows system:

This topic describes the procedure for installing System Availability on a Windows managed system.

The following prerequisites apply to this installation:

- System Availability should be installed on the management server and management console before installing the agent components of System Availability on managed systems.
- IBM Director Agent should be installed on the managed system before installing System Availability.

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 System Availability on a Windows managed system:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation. The downloaded installation files are contained in a zip file. Use the unzip command to extract the contents to a temporary directory.
2. Click **Start** → **Run**.
3. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\setup.exe
   ```

   download represents the location to which the System Availability download package was unzipped.
4. In the first panel of the System Availability Agent InstallShield Wizard, click **Next**.
5. In the second panel of the System Availability Agent InstallShield Wizard, select **I accept the terms in the license agreement**, then click **Next**.
6. In the third panel of the System Availability Agent InstallShield Wizard, click **Next**. You cannot modify the installation directory; the System Availability Agent must be installed in the same location as IBM Director Agent.

7. In the fourth panel of the System Availability Agent InstallShield Wizard, click **Install**. A new panel displays the installation progress.
8. When installation has completed, click **Finish**.

Installing the System Availability extension on a managed Linux system:

This topic describes installation procedures for System Availability on a Linux managed system.

The following prerequisites apply to this installation:

- System Availability should be installed on the management server and management console before installing the agent components of System Availability on managed systems.
- IBM Director Agent should be installed on the managed system before installing System Availability.

Notes:

1. System Availability agent components are automatically installed on the management server when the System Availability server components are installed. It is not necessary or possible to separately install System Availability 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 System Availability on a Linux managed system:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation. The downloaded installation files are contained in a tar file. Use the tar -x command to extract the contents to a temporary directory.
2. Stop IBM Director Agent. From a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
3. Change to the directory in which the installation package is located. Type the following command and press **Enter**:
   ```
   cd /download/
   ```

   download represents the location to which the System Availability download package was extracted.
4. Type one of the following commands and press **Enter**:

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

   The installation progress is displayed.
5. Restart IBM Director Agent. From a command prompt, type the following command and press **Enter**:

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

Installing z/VM Center

This topic describes the general procedure for installing the z/VM Center extension components for IBM Director.

z/VM Center may be installed on Windows, Linux, and i5/OS platforms. Installing z/VM Center is performed in several steps, each of which is described in a topic in this section.

1. Install z/VM Center on the management server.

Option	Description
Windows server	"Installing z/VM Center on a Windows server"
Linux server	"Installing z/VM Center on a Linux server" on page 289
AIX server	"Installing z/VM Center on an AIX server" on page 290
i5/OS server	z/VM Center is installed with IBM Director Server on i5/OS. No separate installation is required for the extension.

   Note: On Windows, Linux, and AIX, z/VM Center user-interface components for IBM Director Console are automatically installed on the management server when the z/VM Center server components are installed. It is not necessary or possible to separately install z/VM Center console components on a management server.

   z/VM Center agent components are automatically installed on the management server when the z/VM Center server components are installed.

2. On the management server where you have installed the z/VM Center server extension, install the license key for the Virtual Server Deployment task and for the Server Complexes task. (See "Installing the license key for the z/VM Center extension tasks" on page 290).
3. **Optional:** Install z/VM Center user-interface components for IBM Director Console on remote management consoles.

Option	Description
Windows console	"Installing z/VM Center on a Windows console" on page 291
Linux console	"Installing z/VM Center"
AIX console	"Installing z/VM Center on an AIX console" on page 292

4. Install the z/VM CIM instrumentation. (See "Installing the z/VM CIM instrumentation on the z/VM manageability access point" on page 293)

Installing z/VM Center on a Windows server:

This topic describes installation procedures for z/VM Center on a Windows management server.

IBM Director Server must be installed on the management server before installing the z/VM Center extension.

Complete the following steps to install the z/VM Center extension on a Windows management server:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close all applications, including any command-prompt windows.
3. Click **Start** → **Run**
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\zVMCenterServerExt_version_windows.exe
   ```

   download represents the location where the z/VM Center download package was saved.
5. In the first panel of the z/VM Center extension for IBM Director Server InstallShield Wizard, click **Next**.
6. In the second panel of the z/VM Center extension for IBM Director Server InstallShield Wizard, select **I accept the terms in the license agreement**, then click **Next**.
7. In the third panel of the z/VM Center extension for IBM Director Server InstallShield Wizard, click **Next** without making any changes.
8. In the fourth panel of the z/VM Center extension for IBM Director Server InstallShield Wizard, click **Install**. A new panel displays the installation progress.
9. When installation has completed, click **Finish**.

Installing z/VM Center on a Linux server:

This topic describes installation procedures for z/VM Center on a Linux management server.

IBM Director Server must be installed on the management server before installing the z/VM Center extension.

Complete the following steps to install the z/VM Center extension on a Linux management server:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Stop IBM Director Server. From a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstop
   ```
3. Change to the directory where the installation package is located.
4. Type the following command and press **Enter**:

   ```
   rpm -ivh zVMCenterServerExt-version.noarch.rpm
   ```

   version represents the version of the RPM. The installation progress is displayed.
5. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:

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

The IBM Director z/VM Center Server installation process installs the server, console, and agent components of z/VM Center on the management server.

After installing the server, console, and agent components of z/VM Center on the management server, you also need to install the license key for the Virtual Server Deployment task and the Server Complexes task on the management server, the console components on any other management consoles, and the z/VM CIM instrumentation on each z/VM you want to manage with IBM Director.

Installing z/VM Center on an AIX server:

This topic describes how to install z/VM Center on an AIX management server.

IBM Director Server must be installed on the management server before installing the z/VM Center extension.

To install z/VM Center on the management server running AIX, perform the following steps on the management server:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Stop IBM Director Server. From a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstop
   ```
3. Change to the directory where the installation files are located.
4. If the downloaded files do not include a .toc file, create one now. Type the following command and press **Enter**:

   ```
   inutoc directory
   ```

   In the command *directory* represents the directory where the installation files are located.
5. Type the following command and press **Enter**:

   ```
   installp -acgNQqXY -d directory IBM.Director.zVMCenterServerExt
   ```

   In the command *directory* represents the directory where the installation files are located.
6. Restart IBM Director Server. From a command prompt, type the following command and press **Enter**:

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

Installing the license key for the z/VM Center extension tasks:

If you want to work with the Virtual Server Deployment task or the Server Complexes task of z/VM Center extension, you must install a license key.

Before you start:

- To obtain the license key you must purchase the IBM Director Extensions, V5.10 feature of IBM Virtualization Engine and Infrastructure Services for Linux on System z9 and zSeries, V2.1. You receive the license key in printed form.
- You must have installed the z/VM Center extension on your IBM Director Server.
- You need root authority to install the license key.

You must install the license key on each IBM Director Server on which you plan to use the Virtual Server Deployment task or the Server Complexes task.

As a user with administrator authority on the system on which IBM Director Server runs, complete these steps to install the z/VM Center license key:

1. Establish a connection with or open a command prompt on the system on which IBM Director Server runs.
2. Ensure that the file *installation_directory*/proddata/ZvmCenter.properties exists, where *installation_directory* is the directory to which you have installed IBM Director Server. Create an empty file if it does not exist.
3. Write a statement of the following form to *installation_directory*/proddata/ZvmCenter.properties:

   ```
   VSDandSC.Task.License = key
   ```

   where *installation_directory* is the directory to which you have installed IBM Director Server and *key* is the license key.
4. Restart IBM Director Server.

Installing z/VM Center on a Windows console:

This topic describes installing procedures for z/VM Center on a Windows management console.

IBM Director Console must be installed before installing the z/VM Center extension.

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

Complete the following steps to install the z/VM Center extension on a Windows management console:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close all applications, including any command-prompt windows.
3. Click **Start** → **Run**
4. In the Run dialog, type the following command in the **Open** field and press **Enter**:

   ```
   download\zVMCenterConsoleExt_version_windows.exe
   ```

   download represents the location where the z/VM Center download package was saved and *version* represents the version of the download package.
5. In the first panel of the z/VM Center extension for IBM Director Console InstallShield Wizard, click **Next**.
6. In the second panel of the z/VM Center extension for IBM Director Console InstallShield Wizard, select **I accept the terms in the license agreement**, then click **Next**.
7. In the third panel of the z/VM Center extension for IBM Director Console InstallShield Wizard, click **Next** without making any changes.
8. In the fourth panel of the z/VM Center extension for IBM Director Console InstallShield Wizard, click **Install**. A new panel displays the installation progress.

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

Installing z/VM Center on a Linux console:

This topic describes installation procedures for z/VM Center on a Linux management console.

IBM Director Console must be installed before installing the z/VM Center extension.

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

Complete the following steps to install z/VM Center on a remote Linux console:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console.
3. Change to the directory where the installation package is located.
4. Type the following command and press **Enter**:
   ```
   rpm -ivh zVMCenterConsoleExt-version.noarch.rpm
   ```
   version represents the version of the RPM. The installation progress is displayed.
5. Restart IBM Director Console.

Installing z/VM Center on an AIX console:

This topic describes installation procedures for z/VM Center on an AIX management console.

IBM Director Console must be installed before installing the z/VM Center extension.

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

Complete the following steps to install z/VM Center on a remote AIX console:

1. Copy the downloaded installation files to a temporary directory on the machine on which you will be performing the installation.
2. Close IBM Director Console if it is running.
3. Change to the directory where the installation files are located.
4. If the downloaded files do not include a .toc file, create one now. Type the following command and press **Enter**:
   ```
   inutoc directory
   ```
   In the command *directory* represents the directory where the installation files are located.
5. Type the following command and press **Enter**:
   ```
   installp -acgNQqXY -d directory IBM.Director.zVMCenterConsoleExt
   ```

In the command *directory* represents the directory where the installation files are located.

6. Restart IBM Director Console.

Installing the z/VM CIM instrumentation on the z/VM manageability access point:

This topic describes how to install the z/VM CIM instrumentation that you require if you want to work with z/VM Center.

Before you start:

- You require a Linux system that runs in a z/VM guest virtual machine. Apart from installing the z/VM CIM instrumentation, you must also set up the z/VM guest virtual machine as described in “Setting up the z/VM manageability access point” on page 178.
- You need to install the z/VM CIM instrumentation in a guest virtual machine on each z/VM system on which you want to use z/VM Center. You must not install the z/VM CIM instrumentation on multiple guest virtual machines on the same z/VM system.
- You need a Linux system on which you have already installed IBM Director Agent as described in “Installing Level 2: IBM Director Agent on Linux for System z9 and zSeries” on page 239
- You require root access to the Linux system.

Complete these steps to install the z/VM CIM instrumentation that implements the z/VM management profile:

1. Establish a Linux terminal session with user root.
2. Make the installation code from the *IBM Director 5.10 for Linux on System z9 and zSeries CD* available to your Linux system. See “Preparing to install IBM Director on a System z9 or zSeries server” on page 166 for more information.
3. Ensure that CIMOM is not running; by typing this command and pressing **Enter**:

   ```
   /etc/init.d/dacimom stop
   ```

4. Change to the directory in which the installation script is located by typing the following command and pressing **Enter**:

   ```
   cd /mnt/director/agent/linux/s390/FILES/
   ```

   where */mnt* is the mount point of the file system on the CD or the location of the IBM Director installation files.

5. If you want to customize the installation go to step 6. If you want to accept the default settings for the installation, type the following command and press **Enter**:

   ```
   ./dirversion_zvmmapagent_linz.sh
   ```

   where *version* is a string that identifies the version.

   Refer to the response file to view the defaults. The response file is named zvmmapagent.rsp and located in the same directory as the installation script. In the response file, “1” indicates that an item is to be installed and “0” indicates that an item is not to be installed.

   Proceed with step 11 on page 294.

6. Copy the response file to a local directory. Type the following command and press **Enter**:

```
cp zvmmapagent.rsp /directory
```

where *directory* is the local directory.

You can specify the location of the RPM files and select log file options.

7. Save the modified response file.
8. To install the z/VM CIM instrumentation using the response file, type the following command and press **Enter**:

   ```
   ./dirversion_zvmmapagent_linz.sh -r /directory/zvmmapagent.rsp
   ```

   where *directory* is the local directory to which you copied the response file.
9. **Optional:** Keep the response file for future use and reference.
10. Install and configure the z/VM CIM instrumentation that implements the z/VM management profile. If it is not your present working directory, change to the directory from which you have installed the RPM for IBM Director Agent.

    Result: The installation script installs the z/VM CIM instrumentation, assures the required SLP service-type registration, and configures Linux to start CIMOM automatically when Linux starts.
11. Confirm that CIMOM can be started by typing the following command and pressing **Enter**:

    ```
    /etc/init.d/dacimom start
    ```
12. Change the working directory by typing the following command and pressing **Enter**:

    ```
    cd /opt/ibm/director/cimom/bin
    ```
13. Display the operating system class by typing the following command and pressing **Enter**:

    ```
    ./CLI -niq ei IBM_ZvmOperatingSystem
    ```

    The IBM_ZvmOperatingSystem CIM class contains basic information about the z/VM system.

    Example:

    ```
    ./CLI -niq ei IBM_ZvmOperatingSystem
    path= IBM_ZvmOperatingSystem.CreationClassName="IBM_ZvmOperatingSystem",...

    //Instance of Class IBM_ZvmOperatingSystem
    instance of class IBM_ZvmOperatingSystem
    {
    string Caption;

    ...
    string Name = "BOEVMID1";
    uint16 OSType = 39;
    uint16 OperationalStatus[] = {2};
    string OtherEnabledState = "";
    string OtherTypeDescription = "z/VM";
    string ProfileVersion = "1.1.0";
    uint16 RequestedState = 5;
    uint64 TotalVirtualMemorySize;
    uint64 TotalVisibleMemorySize = 5368709120;
    string Version = "5.1.0.402";
    };
    ```
14. Ensure that the host name is resolvable. For example, issue a ping command for the host name. You can make the host name resolvable by ensuring that there is a corresponding DNS entry or an entry in /etc/hosts.

Changing IBM Director installation options

This topic describes procedures for changing installation options after installing IBM Director.

Changing installation options on NetWare

This topic provides procedures for modifying an IBM Director installation that is running on NetWare.

Notes:

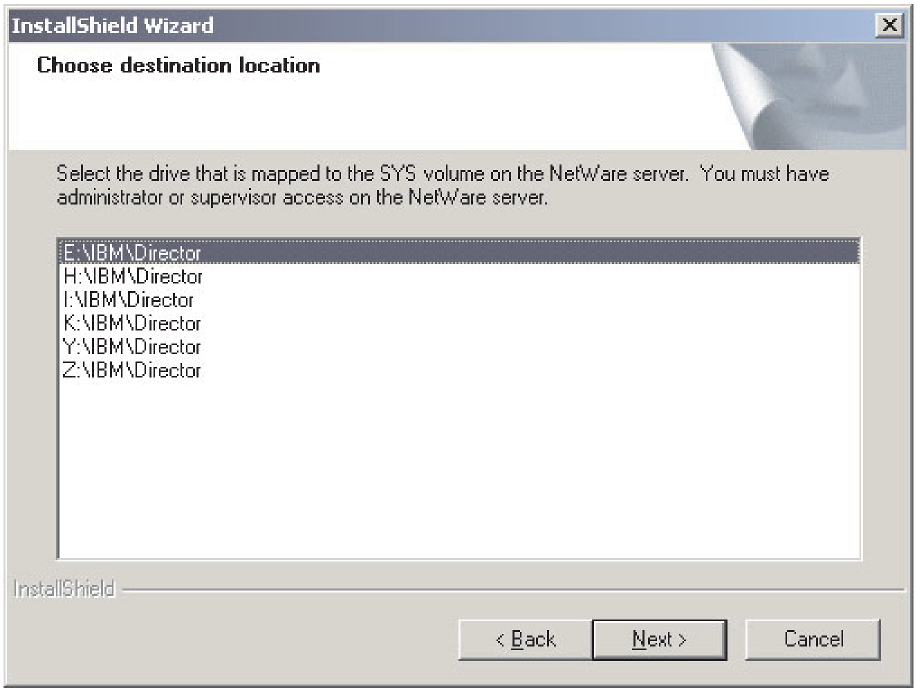
1. You cannot use this procedure to uninstall the MPA Agent. However, you can use this procedure to add it to an existing IBM Director Agent installation.
2. To modify an IBM Director Agent installation, you must log on to the NetWare server from a Windows workstation running the NetWare Client for Windows.
3. The SYS volume must be mapped as a drive to the system running Windows.
4. You must have administrator or supervisor access on the NetWare server.

Complete the following steps to add Management Processor Assistant Agent to an existing IBM Director Agent installation:

1. Stop IBM Director Agent. From the server running NetWare, change to the console screen. Type the following command and press **Enter** :

   ```
   unload twgipc
   ```

2. Start Windows Explorer and open the \directory\\FILES directory, where *directory* is the location to which you saved the dir5.10_agent_netware.exe file.
3. Double-click the dir5.10_agent_netware.exe file. The InstallShield wizard starts.
4. Click **Next**. The ″Installing IBM Director Agent″ window opens.
5. Click **Next** to accept the license agreement. The “Choose destination location” window opens.



InstallShield Wizard

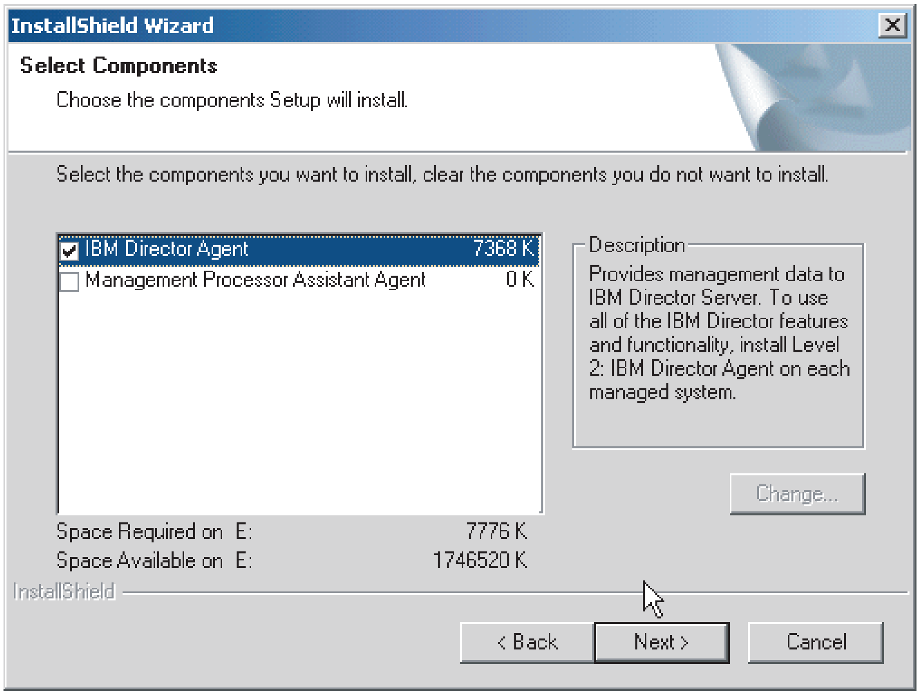
Choose destination location

Select the drive that is mapped to the SYS volume on the NetWare server. You must have administrator or supervisor access on the NetWare server.

E:\IBM\Director
H:\IBM\Director
I:\IBM\Director
K:\IBM\Director
Y:\IBM\Director
Z:\IBM\Director

Figure 48. Modifying IBM Director Agent on NetWare: “Choose destination location” window

6. Click the drive that is mapped to the SYS volume on the NetWare server; then, click **Next**. The "Select Components" window opens.



InstallShield Wizard

Select Components

Choose the components Setup will install.

Select the components you want to install, clear the components you do not want to install.

☑ IBM Director Agent 7368 K
□ Management Processor Assistant Agent 0 K

Description

Provides management data to IBM Director Server. To use all of the IBM Director features and functionality, install Level 2: IBM Director Agent on each managed system.

Space Required on E: 7776 K
Space Available on E: 1746520 K

Figure 49. Modifying IBM Director Agent on NetWare: “Select Components” window

7. Select the Management Processor Assistant Agent check box.

8. Click **Next**. The "Setup Status" window opens, and the IBM Director Agent installation begins. When the installation is completed, the "InstallShield Wizard Complete" window opens.
9. Click **Finish**.
10. On the NetWare server, change to the console screen.
11. Type the following command and press **Enter**:

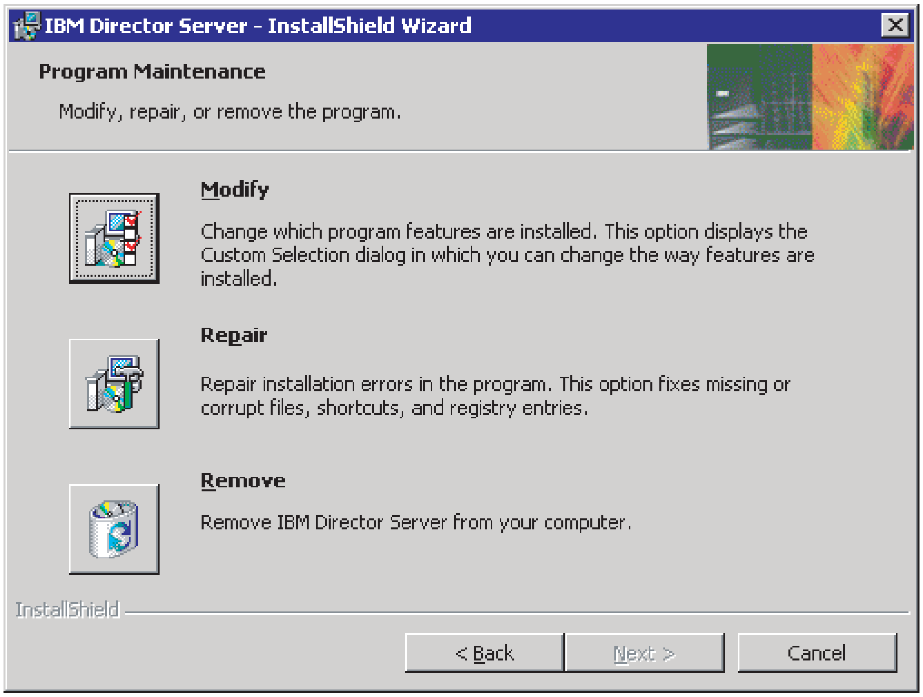
```
load twgipc
```

Changing installation options on Windows

This topic describes how to add a previously uninstalled feature to or remove a feature from IBM Director.

Complete the following steps to add a previously uninstalled feature to or remove a feature from IBM Director Server, IBM Director Console, or IBM Director Agent:

1. Click **Start Settings > Control Panel**. The Control Panel window opens.
2. Double-click **Add/Remove Programs**. The Add/Remove Programs window opens.
3. Click the IBM Director software component that you want to modify; then, click **Change**. The InstallShield wizard starts, and the Welcome to the InstallShield Wizard window opens.
4. Click **Next**. The Program Maintenance window opens.



IBM Director Server - InstallShield Wizard

Program Maintenance

Modify, repair, or remove the program.

Modify

Change which program features are installed. This option displays the Custom Selection dialog in which you can change the way features are installed.

Repair

Repair installation errors in the program. This option fixes missing or corrupt files, shortcuts, and registry entries.

Remove

Remove IBM Director Server from your computer.

Figure 50. Program Maintenance window

5. Click **Modify**; then, click **Next**.
6. Continue through the wizard, making changes as necessary.

Changing installation options on Linux

This topic describes how to add a previously uninstalled feature to or remove a feature from IBM Director Server, IBM Director Console, or IBM Director Agent on a system running Linux.

Installing an IBM Director feature on Linux:

This topic describes how to add a previously uninstalled feature to or remove a feature from IBM Director on Linux.

Complete the following steps to add a previously uninstalled feature to or to remove a feature from IBM Director Server, IBM Director Console, or Level 2: IBM Director Agent:

1. Copy the applicable response file (*.rsp) to a local directory.
2. Open an ASCII text editor and modify the response file.
3. Save the modified response file.
4. Run the installation script for the component you want to change using the response file.

For component-specific instructions about modifying response files and running the installation, see the Installing section.

Uninstalling an IBM Director feature on Linux:

This topic describes how to uninstall an IBM Director feature on Linux.

Complete the following steps to remove a feature from IBM Director Server, IBM Director Console, and IBM Director Agent:

1. Modify the diruninstall script, which is in located in the IBM Director installation directory. By default, this script removes all detected IBM Director components. To uninstall specific components, you must set the SmartUninstall setting to 0 and then make the other modifications.
2. Save the modified uninstallation script.
3. To stop IBM Director Agent, from a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
4. Run the diruninstall script. Type the following command and press **Enter**:
   ```
   /SourceDirectory/diruninstall
   ```

   where *SourceDirectory* is the directory to which you copied the modified uninstallation script.
5. To start IBM Director Agent, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstart
   ```

You also can use the standard RPM commands.

Upgrading from previous releases

This topic provides information about upgrading from previous releases of IBM Director.

The upgrade process for all IBM Director 5.10 components begins by uninstalling all existing IBM Director components and features and continues with the installation of IBM Director 5.10. You can choose to install previously uninstalled features and extensions. The database configuration you used in the previous version is maintained.

Note: You must uninstall any separately installed IBM Director extensions *before* upgrading IBM Director Server, IBM Director Console, or IBM Director Agent.

To upgrade IBM Director, follow the steps for a new installation, including any planning and environment preparation that might be necessary.

If you are running one of the following versions of IBM Director on a supported operating system, you can upgrade to IBM Director 5.10:

- IBM Director 4.10
- 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
- IBM Director 4.22

Versions of IBM Director earlier than IBM Director 4.10 are not compatible with IBM Director 5.10. If you are running a version of IBM Director earlier than IBM Director 4.10, you can perform one of the following operations:

- Uninstall your existing IBM Director installation and then install IBM Director 5.10.
- Upgrade your existing IBM Director installation to a version from which you can upgrade to IBM Director 5.10. Then, upgrade to IBM Director 5.10.

Before upgrading IBM Director, consider the following information:

- (Upgrading from an installation to which a Product Engineering fix has been applied) You must return IBM Director to the base installation state before upgrading to version 5.10. To do this, perform one of the following tasks:
  - (Windows only) Uninstall the fix using the Windows Add/Remove Programs feature.
  - (Linux only) Uninstall the fix using the following command:

    ```
    rpm -e fixname
    ```

    where *fixname* is the name of the fix to be removed.
- (Linux upgrades only) Depending on the Linux distribution and the version of IBM Director from which you are upgrading, your environment might be using one of the following IBM Director installation directories:
  - /opt/IBM/director/
  - /opt/ibm/director/

  Ensure that you install the upgrade in the same location as the previous installation of IBM Director. When using instructions throughout the documentation, use the appropriate path depending on your configuration.
- The version of IBM Director Agent cannot be later than the version of IBM Director Server running on the management system.
- IBM Director Server and IBM Director Console must have the same release level. If you upgrade IBM Director Server, you must upgrade IBM Director Console also.

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

If version 4.22 or earlier of the IBM LM78 or SMBus device driver for Linux is installed on a managed system, you must uninstall it and then install version 5.10 of the device driver.

Related reference

Chapter 2, "Planning," on page 81
This topic contains information about planning to install IBM Director.

Related information

"Preparing to install IBM Director" on page 153
Use this section to ensure that your environment is set up properly for the installation and use of IBM Director.

"Installing IBM Director" on page 182
This topic provides procedures for installing IBM Director Server, IBM Director Console, Level 1: IBM Director Core Services, Level 2: IBM Director Agent, and IBM Director extensions.

Upgrading IBM Director Server

This topic contains instructions for upgrading IBM Director Server.

You can upgrade to IBM Director Server 5.10 from IBM Director Server, version 4.1 or later. The management server must be running one of the following operating systems:

- i5/OS, version 5, release 3
- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
- Windows 2000 Server and Advanced Server (Service Pack 3 required)
- Windows Server 2003, Enterprise, Standard, and Web Editions

To upgrade IBM Director Server, follow the general installation instructions for your operating system.

Upgrading IBM Director Console

This topic contains instructions for upgrading IBM Director Console.

You can upgrade to IBM Director Console 5.10 from IBM Director Console, version 4.1 or later. The management console must be running one of the following operating systems:

- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- SUSE LINUX Enterprise Server 8 for x86 (Service Pack 3 required)
- Windows 2000 Server and Advanced Server
- Windows Server 2003, Enterprise, Standard, and Web Editions
- Windows 2000 Professional, Server, and Advanced Server Editions (Service Pack 3 required)
- Windows XP Professional Edition (Service Pack 1 recommended)

To upgrade IBM Director Console, follow the general installation instructions for your operating system.

Upgrading IBM Director Agent

This topic contains instructions for upgrading IBM Director Agent.

Notes:

- 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.
- The version of IBM Director Agent cannot be later than the version of IBM Director Server running on the management system.
- If you want to use IBM Director to manage a system running an operating system that IBM Director 5.10 does not support, do not upgrade IBM Director Agent. IBM Director 5.10 can manage systems running IBM Director Agent, versions 4.10 and later.

You can upgrade to IBM Director Agent 5.10 from IBM Director Agent, version 4.1 or later. You can use either standard installation procedures or the IBM Director Software Distribution task. The managed system must be running one of the following operating systems:

- AIX, version 5.2
- i5/OS, version 5, release 3
- Novell NetWare, version 6.5
- Red Hat Enterprise Linux AS and ES, version 3.0, for Intel x86
- Red Hat Enterprise Linux AS, version 3.0, for AMD64
- Red Hat Enterprise Linux AS, version 3.0, for IBM POWER
- Red Hat Enterprise Linux AS and ES, version 4.0, for Intel x86
- Red Hat Enterprise Linux AS, version 4.0, for AMD64
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 8 for AMD64
- SUSE LINUX Enterprise Server 9 for x86
- SUSE LINUX Enterprise Server 9 for AMD64
- VMware ESX Server, version 2.1, with the following guest operating systems:
  - SUSE LINUX Enterprise Server 8 for x86
  - Windows 2000, Server
  - Windows Advanced Server
  - Windows XP Professional Edition
  - Windows Server 2003, Enterprise, Standard, and Web Editions
- Windows 2000, Server
- Windows Advanced Server
- Windows XP Professional Edition
- Windows Server 2003, Enterprise, Datacenter, Standard, and Web Editions
- Windows Server 2003, Enterprise, Datacenter, Standard, and Web Editions, 64-bit versions

To upgrade IBM Director Agent using standard installation procedures, follow the general installation instructions for your operating system.

Upgrading IBM Director Agent using the Software Distribution task

This topic provides information about how to use the Software Distribution task to upgrade IBM Director Agent.

You can use the IBM Director Software Distribution task to upgrade IBM Director Agent on managed systems running AIX, i5/OS, Windows (32-bit and 64-bit), or Linux (32-bit and 64-bit).

The following files describe IBM Director Agent:

- dir5.10_agent_aix.xml (located in the director\agent\aix\META-INF directory on the *IBM Director 5.10 for AIX 5L* CD)
- dir5.10_agent_linux.xml (located in the director\agent\linux\i386\META-INF directory on the *IBM Director 5.10* CD)
- dir5.10_agent_windows.xml (located in the director\agent\windows\i386\META-INF directory on the *IBM Director 5.10* CD)
- Directori5OSRPD_agentpackagedIU.xml (located on the i5/OS management server, if you have selected to install the IBM Director Agent images, in the /QIBM/ProdData/VE2/ManagedNodes/Directori5OS/META-INF directory.

The following files describe the 64-bit, Intel Itanium versions of the IBM Director Agent:

- dir5.10_agent_linux64.xml
- dir5.10_agent_windows64.xml

(xSeries only) The following files describe the IBM LM78 and IBM SMBus device drivers:

- lm78driver_linux.xml
- smbdriver_linux.xml

You can download these files from the IBM Director Support Web site at www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/. They are included in the .zip or .gz packages for the component or device driver to which they apply.

When you import the XML files into IBM Director, the IBM Update Assistant creates software packages. Then, you can use the IBM Director Software Distribution task to distribute the packages to the managed systems.

To install the IBM LM78 or SMBus device driver using the Software Distribution task, you first must build the binary RPM file and copy it to the same directory as the smbdriver_linux.xml file.

Note: If the IBM LM78 or SMBus device driver for Linux, version 4.20 or earlier is installed on the managed system, you must uninstall the device driver before installing version 5.10 of the driver.

Creating a software package:

This topic describes how to create a software package for installing or upgrading IBM Director Agent or installing IBM Director Core Services.

Complete the following steps to create a software package:

1. Locate the installation or upgrade packages. Refer to "Installing IBM Director Core Services using the Software Distribution task" on page 228 or "Installing IBM Director Agent using the Software Distribution task" on page 258 for more information.
2. If you want to accept the default settings for the installation, go to step 3. Otherwise, copy the response file (diragent.rsp for IBM Director Agent; coresvcs.rsp for IBM Director Core Services) and open the copy in an ASCII text editor. Modify the response file as needed; then, save the modified file with a new file name.
3. Start IBM Director Console.
4. In the Tasks pane, double-click **Software Distribution**. The "Software Distribution Manager" window opens.

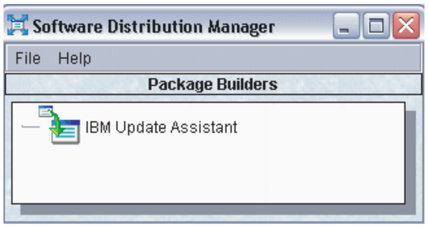


Figure 51. Creating a software package: "Software Distribution Manager" window (Standard Edition)

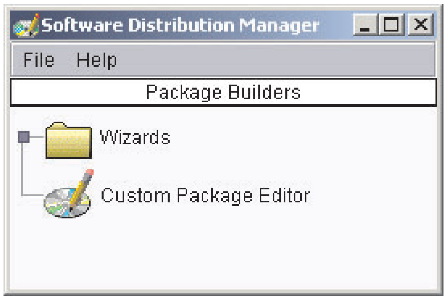
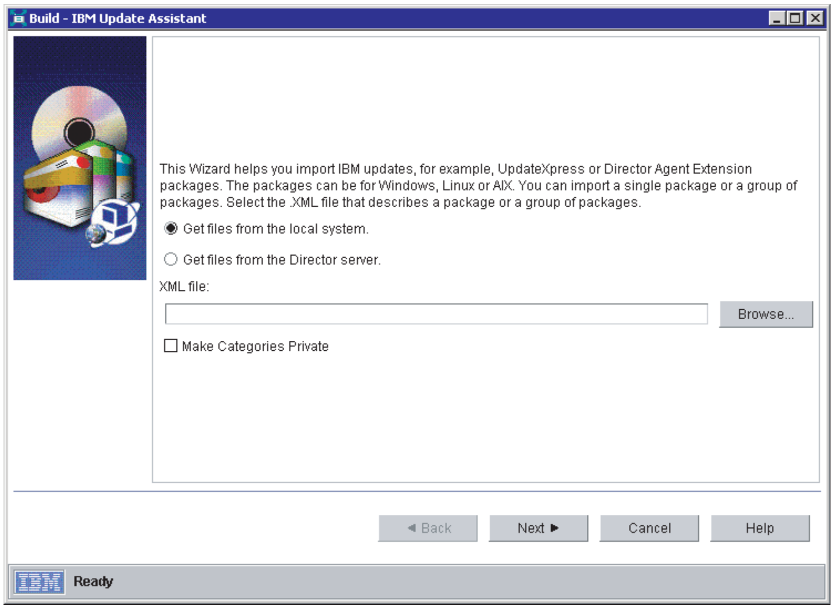


Figure 52. Creating a software package: Software Distribution Manager window (Premium Edition)

5. If you have not installed IBM Director 5.10 Software Distribution (Premium Edition), go to step 6. Otherwise, expand the **Wizards** tree.
6. Double-click **IBM Update Assistant**. The "IBM Update Assistant" window opens.



This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

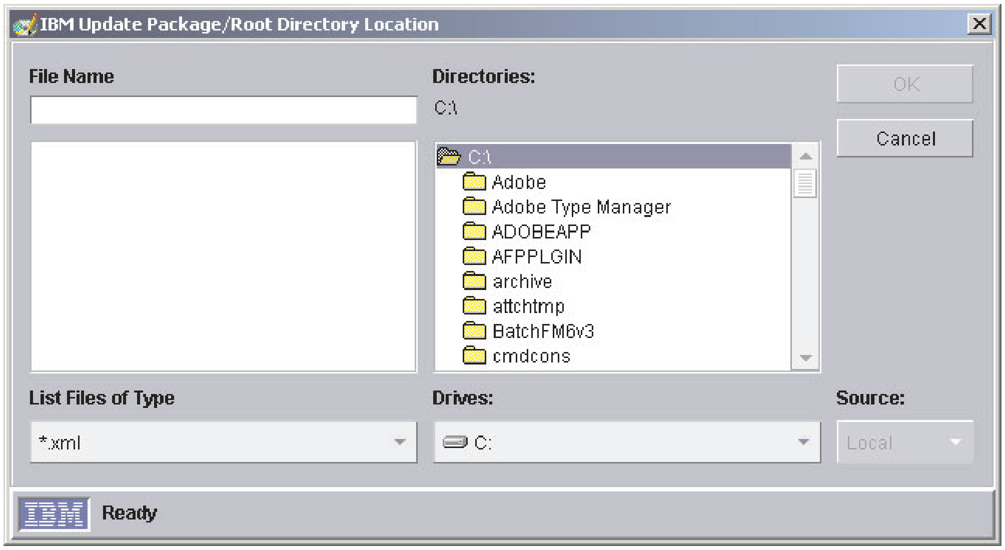
○ Get files from the Director server.

XML file:

□ Make Categories Private

Figure 53. Creating a software package: "IBM Update Assistant" window

7. If you want to get files from the management server, click **Get files from the Director server**. By default, **Get files from the local system** is selected.
8. To select a file, click **Browse**. The "IBM Update Package/Root Directory Location" window opens.



File Name:

Directories: C:\

List Files of Type: *.xml

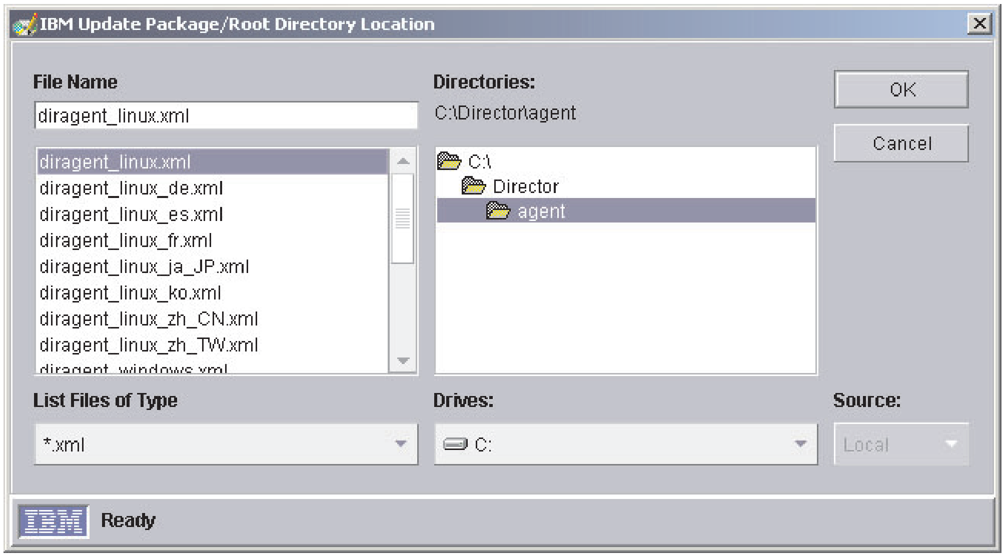
Drives: C:

Source: Local

Figure 54. Creating a software package: "IBM Update Package/Root Directory Location" window

9. Locate the appropriate XML file and click it. The name of the XML file is displayed in the **File Name** field.

   Note: Use the correct XML file for your language. The correct file for English installations is the one without the language code. For example, dir5.10_agent_windows.xml



IBM Update Package/Root Directory Location

File Name: diragent_linux.xml

- diragent_linux.xml
- diragent_linux_de.xml
- diragent_linux_es.xml
- diragent_linux_fr.xml
- diragent_linux_ja_JP.xml
- diragent_linux_ko.xml
- diragent_linux_zh_CN.xml
- diragent_linux_zh_TW.xml
- diragent_windows.xml

Directories: C:\Director\agent

- C:\
- Director
- agent

List Files of Type: *.xml

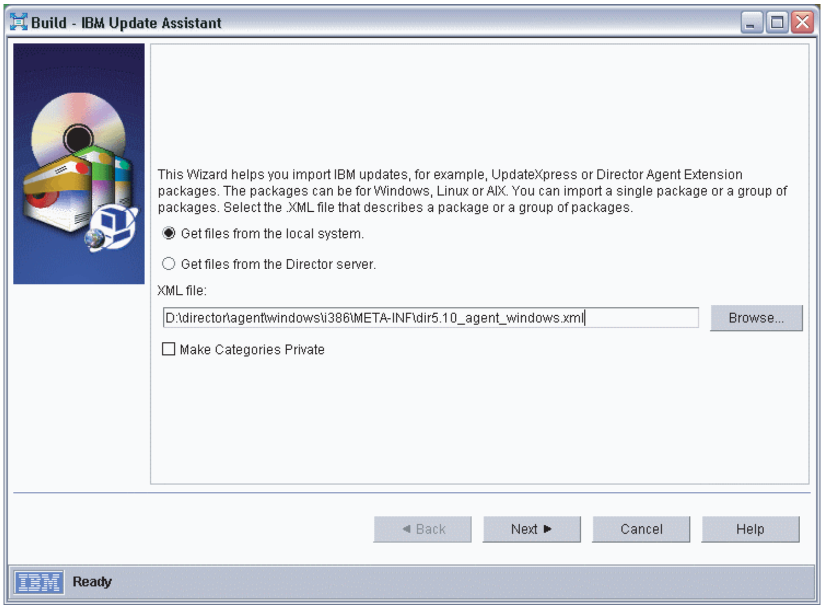
Drives: C:

Source: Local

Ready

Figure 55. Creating a software package: "IBM Update Package/Root Directory Location" window

10. Click **OK**. The "IBM Update Assistant" window reopens.



Build - IBM Update Assistant

This Wizard helps you import IBM updates, for example, UpdateXpress or Director Agent Extension packages. The packages can be for Windows, Linux or AIX. You can import a single package or a group of packages. Select the .XML file that describes a package or a group of packages.

● Get files from the local system.

○ Get files from the Director server.

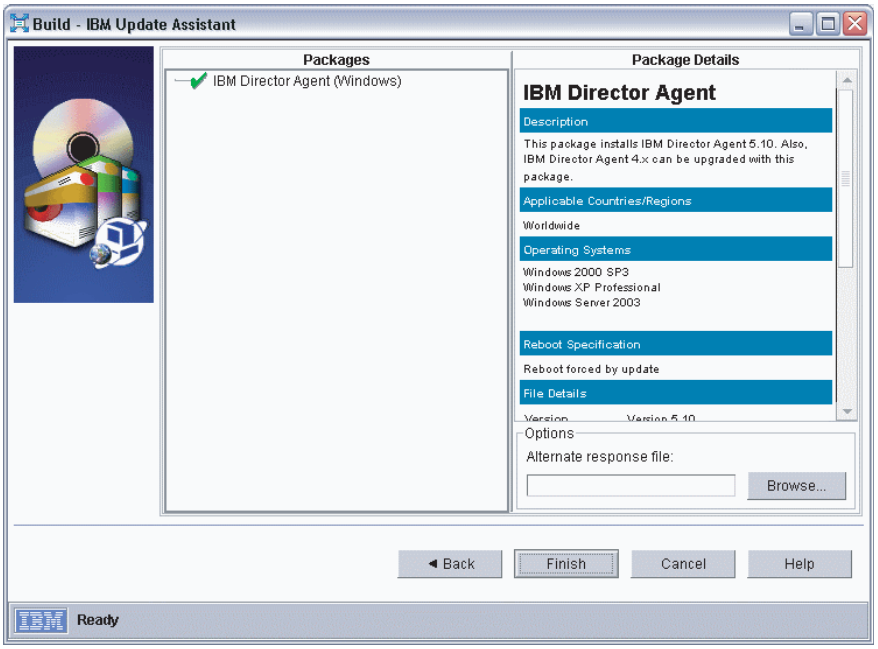
XML file: D:\director\agent\windows\i386\META-INF\dir5.10_agent_windows.xml

□ Make Categories Private

Ready

Figure 56. Creating a software package: "IBM Update Assistant" window

11. Click **Next**. The second "IBM Update Assistant" window opens.



IBM Director Agent

Description

This package installs IBM Director Agent 5.10. Also, IBM Director Agent 4.x can be upgraded with this package.

Applicable Countries/Regions

Worldwide

Operating Systems

Windows 2000 SP3
Windows XP Professional
Windows Server 2003

Reboot Specification

Reboot forced by update

File Details

Version Version 5.10

Figure 57. Creating software packages: "IBM Update Assistant" window

12. To specify an alternative response file, click **Browse** and locate the file that you modified in step 2 on page 303.

    Note: If you do not specify an alternative response file, the package is installed with the default settings that are specified in the installation script.
13. Click **Finish**. As the package is processed, a status message is displayed at the bottom of the window.

    When the processing is completed, the software-distribution package is displayed in the Tasks pane of IBM Director Console.

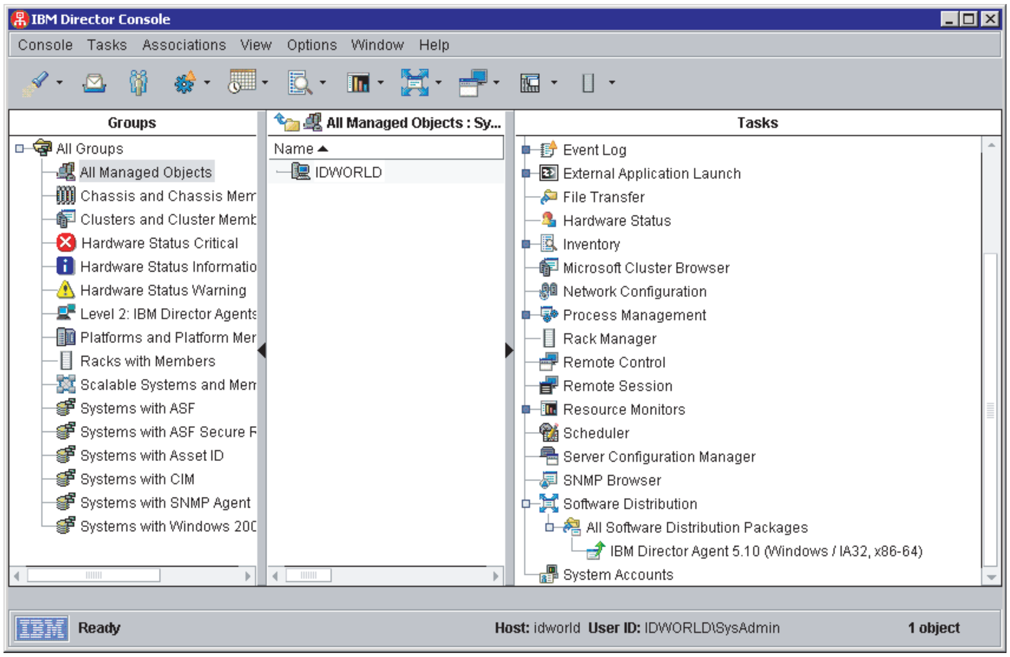


Figure 58. All Software Distribution Packages: IBM Director Agent Upgrade

Installing a software package:

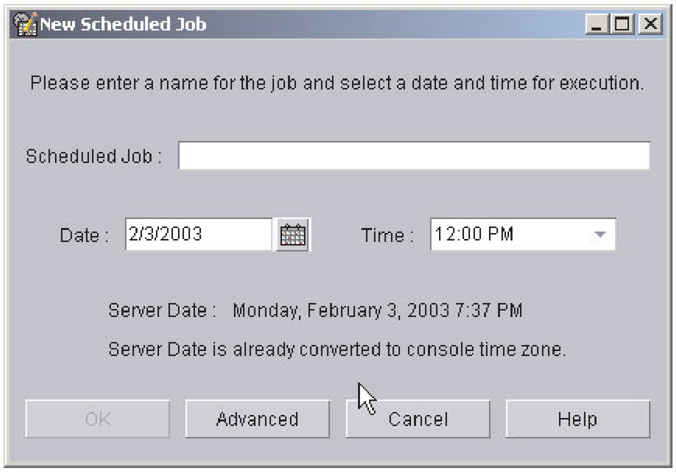
This topic describes how to install a software package using IBM Director.

Note: The Software Distribution task copies the installation package to the client system before starting the installation. On systems running AIX, the package is copied to the root file system. There must be at least 60 MB of free space available in the root file system or the task will fail.

Complete the following steps to install a software package:

1. Start IBM Director Console.
2. In the Tasks pane, expand the Software Distribution task.
3. Click the software package that you want to distribute. Then, drag it into the Group Contents pane and drop it onto the icon that is displayed for the system on which you want to install the software package. A window opens.

   Note: To distribute software to several systems at once, you can drag the software package into the Groups pane and drop it onto the icon for the group. Alternatively, you can select multiple managed systems in the Group Contents pane.
4. When prompted with `Do you wish to create a scheduled job for this task or execute immediately?`, click **Schedule** or **Execute Now**. If you click **Execute Now**, the software package is distributed immediately. If you click **Schedule**, the "New Scheduled Job" window opens.



New Scheduled Job

Please enter a name for the job and select a date and time for execution.

Scheduled Job :

Date : 2/3/2003

Time : 12:00 PM

Server Date : Monday, February 3, 2003 7:37 PM

Server Date is already converted to console time zone.

Figure 59. Scheduling the installation of a software package: "New Scheduled Job" window

5. Schedule the job:
   a. In the **Scheduled Job** field, type a unique name for the job. This name is displayed in the Jobs pane of the Scheduler window.
   b. In the **Date** field, type the day you want the software package to be installed (in MM/DD/YYYY format).
   c. In the **Time** field, type the time you want the software package to be installed.

   For more information about the Scheduler task, see the *IBM Director 5.10 Systems Management Guide*.
6. Click **OK**. The Save Job Confirmation window opens.
7. Click **OK**.

Updating IBM Director

This topic provides information about updating IBM Director.

IBM might offer new releases or updates to this version of IBM Director. If you purchased IBM Director, see the IBM @server Information Center at www.ibm.com/servers/library/infocenter/ for information about new releases.

If you received IBM Director with your IBM @server BladeCenter product or xSeries server, see your hardware documentation for information about updating IBM Director. Also, the IBM @server xSeries Subscription Services, which allows you to receive updates automatically, is available; for more information about this service, contact your IBM representative.

Initially configuring IBM Director

This topic describes how to set up the initial configuration of your system after installing IBM Director.

After completing the installation of IBM Director, you should perform the following initial configuration tasks:

- Authorize IBM Director users

To use IBM Director, a user must have an operating-system account on the management server or the domain. You can assign and edit privileges for users and groups, including task access and group access. By default, new users have no privileges.

- Configure your discovery preferences

  Discovery is the process by which IBM Director Server identifies and establishes connections with systems on which IBM Director Agent is installed. The management server sends out a discovery request and waits for responses from managed systems. The managed systems listen for this request and respond to the management server that sent the request.

  By default, IBM Director Server automatically discovers all managed systems that are on the same subnet as the management server. If you want to manage systems that are on a different subnet, you must configure discovery preferences.
- Perform an automatic system discovery

  The Discover Systems task allows you to discover managed objects automatically. You can select to discover all managed objects or a particular type of managed object.
- Configure software-distribution preferences

  The Software Distribution (Standard Edition) task allows you to import applications and data, build a software package, and distribute the package to IBM Director managed systems.

Authorizing IBM Director users

This topic describes how to authorize IBM Director users. On Windows platforms, you can also edit access privileges for a global group.

IBM Director Console uses the operating-system user accounts for user-logon security. When a user logs in to IBM Director, the user ID and password verification process used by the operating system is used to validate the user's authority to access IBM Director.

To use IBM Director, a user must have an operating-system account on the management server or the domain. In addition, a user must meet one of the following requirements, depending on the operating system running on the management server:

For i5/OS	Member of the IBM Director Administrators or IBM Director Super Administrators group
For Linux	Member of the diradmin or dirsuper group
For Windows	One of the following criteria: • Member of the DirAdmin or DirSuper group • Administrator privileges on the management server or the domain

Users' ability to perform tasks depends on which access privileges they have been assigned in the IBM Director environment. A super user can configure a default set of privileges for the administrator group. A super user also can edit user accounts on an individual basis.

Authorizing users for i5/OS

i5/OS users must have a user profile on the management server that is running i5/OS and be registered in a function usage group.

To initially connect to a managed system running i5/OS, a user must also have a user profile on the managed system. Additionally, a security administrator must authorize these users to IBM Director Server and IBM Director Agent functions.

IBM Director running on i5/OS has a set of associated function identifiers to use for authorizing users, configuring default users, and defining a specific user under which jobs can run. Users must be registered in one of the following functions:
- IBM Director Administrators
- IBM Director Super Administrators

IBM Director is shipped with the user profile QCPMGTDIR. QCPMGTDIR has *ALLOBJ special authority as well as *SECADM special authority. QCPMGTDIR is used to start all IBM Director jobs and is the default profile under which the jobs run. You can change the default profile from QCPMGTDIR to a user profile of your choice for the following function IDs:
- IBM Director Agent default user
- IBM Director Server default user
- IBM Director Agent run as user
- IBM Director Server run as user

The following table describes the three function usage groups to which a user can be authorized.

Function ID	Purpose
IBM Director Administrators	Perform management functions using tasks to which they are authorized.
IBM Director Agent access	Initially connect IBM Director Server to an IBM Director Agent. **Note:** By default, any user with *ALLOBJ authority has access to this function.
IBM Director Agent default user	By specifying a user profile other than the default profile, remote commands can be performed on a managed system using the specified user profile. No user ID and password are required when requesting the command.
IBM Director Agent run as user	By specifying a user profile other than the default profile, jobs on the managed system are performed under this profile. To complete all IBM Director tasks successfully, the user profile must have *ALLOBJ authority.
IBM Director Server default user	Allows a user profile to be registered as the default for tasks such as file transfer, software distribution, and event actions. To complete all IBM Director tasks successfully, the user profile must have *ALLOBJ authority.
IBM Director Server run as user	By specifying a user profile other than the default profile, jobs on the management server are performed under this profile. To complete all IBM Director tasks successfully, the user profile must have *ALLOBJ and *SECADM authority.
IBM Director Super Administrators	Configure a set of privileges for the administrator group, edit user accounts on an individual basis, and use the functions of the DIRCLI client.

Prerequisite:

To authorize users to these functions, you must have *SECADM authority.

Complete the following steps to authorize users to IBM Director functions:

1. In iSeries Navigator, right-click the server and click **Application Administration**.
2. On the Application Administration dialog, click the **Host Applications** tab.
3. Expand **IBM Director for iSeries**.
4. Select the function group to which you want to add users and click **Customize**. Complete the instructions on the dialog to grant authority.

You can also use the Work Function Usage (WRKFCNUSG) command in the character-based interface, WRKFCNUSG QIBM_QDIR*.

Creating user-account defaults

This topic describes how to set the default access privileges for new members of the administrators group.

A super user can use the User Defaults Editor to set the default access privileges for new members of the administrators group.

Complete the following steps to create user-account defaults:

1. In IBM Director Console, click **Options** → **User Administration**.

   This window contains a list of all users authorized to access IBM Director.
2. In the User Administration window, click **User** → **User Defaults**.

   In the User Defaults Editor window, you can set the default access privileges for new members of the DirAdmin group.

   Notes:

   a. For increased security, consider providing no default access privileges. You will have to set access levels for each user, but you can be sure that a user will not accidentally be able to access restricted groups or tasks.
   b. You can restrict access to the Event Action Plan wizard by removing users' access to the Event Action Plan Builder task.

Editing an individual user's access privileges

This topic describes how to edit an individual user's access privileges.

Complete the following steps to edit a user's access privileges:

1. In IBM Director Console, click **Options** → **User Administration**.

   This window contains a list of all users and groups that are authorized to access IBM Director.
2. In the User Administration window, select the user whose access privileges you want to modify. Click **Actions** → **User** → **Edit**.
3. In the User Editor window, click the **Privileges** tab.
4. To add a privilege, click the privilege in the **Available Privileges** pane, and then click **Add**. To remove a privilege, click the privilege in the **Privileges Granted to User** pane, and then click **Remove**.
5. To restrict the user's access to groups, click the **Group Access** tab.
6. To permit the user to access specific groups only, select the **Limit user access only to the groups listed** check box. To add a group, click the group in the **Available Groups** pane and click **Add**. To remove a group, click the group in

the **Groups User Can Access** pane and click **Remove**. To prevent the user from creating new groups or modifying existing groups, select the **Limit user to read-only access of groups** check box.

7. To restrict the user's access to tasks, click the **Task Access** tab.
8. To restrict the user to performing certain tasks only, select the **Limit user access only to the tasks listed** check box. To add a task, click the task in the **Available Tasks** pane and click **Add**. To remove a task, click the task in the **Tasks User Can Access** pane and click **Remove**.

   Note: You can restrict access to the Event Action Plan wizard by removing the user's access to the Event Action Plan Builder task.
9. When you have finished editing the user's privileges, click **OK**.

Editing group access privileges

This topic describes how to edit access privileges for a global group on Windows platforms.

Complete the following steps to edit privileges for a group:

1. In IBM Director Console, click **Options** → **User Administration**.

   This window contains a list of all users and groups that are authorized to access IBM Director.
2. In the User Administration window, click the **Groups** tab.
3. Select the group whose access privileges you want to modify. Click **Actions** → **Group** → **Edit**.
4. In the Group Editor window, click the **Privileges** tab.
5. On the Privileges page, to add a privilege, click the privilege in the **Available Privileges** pane and then click **Add**. To remove a privilege, click the privilege in the **Privileges Granted to User** pane and then click **Remove**.
6. To restrict access for the group to IBM Director groups, click the **Group Access** tab.
7. On the Group Access page, to permit the user to access specific groups only, select the **Limit user access only to the groups listed** check box. To add a group, click the group in the **Available Groups** pane and click **Add**. To remove a group, click the group in the **Groups User Can Access** pane and click **Remove**. To prevent the user from creating new groups or modifying existing groups, select the **Limit user to read-only access of groups** check box.
8. To restrict access for the group to tasks, click the **Task Access** tab.
9. On the Task Access page, to restrict the group to performing certain tasks only, select the **Limit user access only to the tasks listed** check box. To add a task, click the task in the **Available Tasks** pane and click **Add**. To remove a task, click the task in the **Tasks User Can Access** pane and click **Remove**.
10. When you have finished editing the privileges, click **OK**.

Configuring discovery preferences

This topic describes how to configure discovery preferences.

By default, IBM Director Server automatically discovers all managed systems that are on the same subnet as the management server. If you want to manage systems that are on a different subnet, you must configure discovery preferences.

Configuring discovery preferences for Level-2 managed systems

The Level 2: IBM Director Agents page allows you to customize the discovery parameters for Level-2 managed systems.

Complete the following steps to configure discovery preferences for Level 2: IBM Director Agents:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the Level 2: IBM Director Agents page, configure the general discovery preferences for managed systems:
   a. In the **Auto-discover period (hours)** field, select how often IBM Director Server attempts to discover systems automatically. The possible range is one to 168 hours (seven days). By default, autodiscovery is disabled.
   b. In the **Presence Check period (minutes)** field, select how often IBM Director Server checks the status of each managed system. A presence check detects whether a managed system is online or offline. The possible range is one to 240 minutes (four hours); this feature also can be disabled. By default, a presence check is set to occur every 15 minutes.
   c. Select the **Automatically secure unsecured systems** check box to ensure that IBM Director Server automatically secures any unsecured managed systems that it discovers. When this feature is enabled, IBM Director Server prevents future management servers from managing the managed systems without first requesting access.
   d. Select the **Auto-add unknown agents which contact server** check box to ensure that IBM Director Server adds objects for newly-discovered managed systems to the Group Contents pane. This option might be useful if you are reinstalling IBM Director Server in an existing IBM Director environment, or if you have configured instances of IBM Director Agent to contact IBM Director Server directly.
3. At the top of the page, click **System Discovery (IP)**.

   Note: These discovery preferences are for Level-2 managed systems only.
4. To specify that IBM Director Server issues an IP broadcast to discover managed systems on the local subnet, on the System Discovery (IP) page, select the **Use TCP/IP general broadcasts** check box. By default, this feature is enabled.
5. To specify that IBM Director Server issues an IP broadcast to discover managed systems on a remote subnet, complete the following steps:
   a. Click **Add**.
   b. In the Add window, click **Broadcast**.
   c. Click **Next**.
   d. In the Add Broadcast Address window, in the **IP Address** and **Subnet Mask** fields, type the IP address and subnet mask.
   e. Click **OK**. The information about the broadcast operation is displayed in the **Address Entries** field.
6. To specify that IBM Director Server issues an IP multicast, complete the following steps:
   a. Select the **Use TCP/IP multicasts** check box.
   b. In the **Multicast Group** field, type the address of the multicast group address. By default, the multicast group address is set to 224.0.1.118.

c. In the **Multicast TTL** fields, select the time to live for the multicast discovery packet. The time to live is the number of times that a packet is forwarded between subnets. By default, this is set to 32.

Note: If you modify the multicast group address, you also must modify the multicast group address on each managed system.

7. To specify that IBM Director Server issues a broadcast relay request from a Level-2 managed system, complete the following steps:
   a. Click **Add**. The **Add** window opens.
   b. Click **Relay**.
   c. Click **Next**.
   d. In the Add Relay Address window, in the **IP Address** and **Subnet Mask** fields, type the IP address and subnet mask of an existing Level-2 managed system.
   e. Click **OK**. The information about the broadcast relay operation is displayed in the **Address Entries** field.
8. To specify that IBM Director Server issues a unicast, complete the following steps:
   a. Click **Add**.
   b. In the Add window, click **Unicast Address**.
   c. Click **Next**.
   d. In the Unicast Address window, in the **IP Address** field, type the IP address to which the packet is sent.
   e. Click **OK**. The information about the unicast operation is displayed in the **Address Entries** field.
9. To specify that IBM Director Server issues a unicast to a range of IP address, complete the following steps:
   a. Click **Add**.
   b. In the Add window, click **Unicast Range**.
   c. Click **Next**.
   d. In the Add Unicast Address Range window, in the **Start Address** and **End Address** fields, type the starting and ending IP addresses.
   e. Click **OK**. The information about the unicast range operation is displayed in the **Address Entries** field.
10. If you have IPX installed on the management server, at the top of the page, click **System Discovery (IPX)**.
11. To specify that IBM Director Server issues an IPX broadcast to discover managed systems on the local subnet, on the System Discovery (IPX) page, select the **Use IPX general broadcasts** check box. By default, this feature is enabled.
12. To specify that IBM Director Server issues an IPX broadcast to discover managed systems using a specific IPX address, complete the following steps:
    a. Click **Add**.
    b. In the Add IPX address entry window, type the IPX address.
    c. If you want to enable a broadcast relay, select the **Enable broadcast relay** check box.
    d. Click **OK**. The information about the broadcast operation is displayed in the **Address Entries** field.

Configuring discovery preferences for Level-1 managed systems

The Level 1: IBM Director Core Services Systems page allows you to customize the discovery parameters for Level-1 managed systems.

Complete the following steps to configure discovery preferences for Level-1 managed systems:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the Level 1: IBM Director Core Services Systems page, define the discovery preferences that you want to use to find Level-1 managed systems.
3. Click **OK**.

Configuring discovery preferences for Level-0 managed systems

The Level 0: Agentless Systems page allows you to customize the discovery parameters for Level-0 managed systems.

Complete the following steps to configure discovery preferences for Level-0 managed systems:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the Level 0: Agentless Systems page, define the discovery preferences that you want to use to find Level-0 managed systems.
3. Click **OK**.

Configuring discovery preferences for SNMP devices

The SNMP devices page allows you to customize the discovery parameters for SNMP devices.

Complete the following steps to configure discovery preferences for SNMP devices:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the SNMP Devices page, configure the discovery preferences for SNMP devices.
   a. In the **Auto-discover period (hours)** field, select the frequency with which IBM Director Server attempts to discover SNMP devices automatically. The possible range is one to 168 hours (seven days). By default, autodiscovery is disabled.
   b. In the **Presence Check period (minutes)** field, select the frequency that IBM Director Server checks the status of each SNMP device. A presence check detects whether an SNMP device is online or offline. The possible range is one to 240 minutes (four hours); this feature also can be disabled. By default, a presence check is set to occur every 15 minutes.
   c. Select the **Auto-add unknown agents which contact server** check box to ensure that IBM Director Server adds objects for newly-discovered SNMP devices to the Group Contents pane.
3. Configure seed addresses for SNMP discovery:
   a. In the **IP Address and Subnet masks** group box, specify the seed addresses. You can specify multiple IP addresses; the addresses are searched concurrently. By default, the IP address of the management server is added to this list. To optimize the chance of discovering all SNMP devices, be sure to specify the IP addresses for routers and DNS servers. During the discovery operation, IBM Director Server locates the address tables located on the specified devices and adds those addresses to the list of addresses to

search. The process is repeated for every new SNMP device that is discovered from the new addresses. The discovery operation continues until no more addresses are found.

   b. In the **SNMP Version** field, select the SNMP version.
   c. In the **Community Names** field, type the community names and click **Add**. Continue until all community names are added. For SNMP versions 1 and 2c, be sure to order the community names appropriately.

Configuring discovery preferences for SMI-S storage devices

The SMI-S Storage Devices page allows you to customize the discovery parameters for SMI-S storage devices.

Complete the following steps to configure discovery preferences for SMI-S storage devices:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the SMI-S Storage Devices page, select the preferences that you want IBM Director to use.
   a. In the **Auto-discover period (hours)** field, select the frequency with which IBM Director Server attempts to discover SMI-S storage devices automatically. The possible range is one to 168 hours (seven days). By default, autodiscovery is disabled.
   b. In the **Presence Check period (minutes)** field, select the frequency that IBM Director Server checks the status of each SMI-S storage device. A presence check detects whether a storage device is online or offline. The possible range is one to 240 minutes (four hours); this feature also can be disabled. By default, a presence check is set to occur every 15 minutes.
   c. Under **Service Location Protocol (SLP) Profiles**, select the SLP profiles that IBM Director Server will discover. The default is SNIA:Array.
   d. Under **Naming Conventions Template for SMI-S Devices**, add the parameters to include in the **Template Name** by selecting a parameter in the **Available Parameters** column, and then clicking **Add** to place it in the **Selected Parameters** column. To remove a parameter from the template name, select a parameter in the **Selected Parameters** column, and then click **Remove**. To restore the original default parameters, select the **Reset to default value** check box. The default is %MANUFACTURER% %HARDWARE_TYPE_MODEL% %HARDWARE_SERIAL_NUMBER%
3. To save your selections, click **OK**.

Configuring discovery preferences for BladeCenter Chassis

The BladeCenter Chassis page allows you to customize the discovery parameters for BladeCenter Chassis.

Complete the following steps to configure discovery preferences for BladeCenter Chassis:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the BladeCenter Chassis page, configure the general preferences for discovering BladeCenter chassis:
   a. In the **Auto-discover period (hours)** field, select the frequency with which IBM Director Server attempts to discover BladeCenter chassis automatically. The possible range is one to 168 hours (seven days). By default, autodiscovery is disabled.
   b. In the **Presence Check period (minutes)** field, select the frequency that IBM Director Server checks the status of each BladeCenter chassis. A presence

check detects whether an SNMP device is online or offline. The possible range is one to 240 minutes (four hours); this feature also can be disabled. By default, a presence check is set to occur every 15 minutes.

3. Specify the conventions that IBM Director Server uses when you rename BladeCenter chassis automatically. By default, this naming template is set to IBM %CHASSIS_MACHINE_TYPE_MODEL% %CHASSIS_SERIAL_NUMBER%.
   a. Click a parameter in the **Selected Parameters** field; then, click **Remove**. Continue until you have removed the default parameters.
   b. In the **Available Parameters** field, click a parameter; then, click **Add**. The parameter is added to the **Selected Parameters** list and the **Naming Template** field. Continue until you have selected all the parameters that you want to use.

   To restore the renaming conventions to the default setting, select the **Reset to default value** check box.

Configuring discovery preferences for physical platforms

The Physical Platforms page allows you to customize the discovery parameters for physical platforms.

Complete the following steps to configure discovery preferences for physical platforms:

1. In IBM Director Console, click **Options** → **Discovery Preferences**.
2. In the Discovery Preferences window on the Physical Platforms page, configure the general preferences for discovering service processors:
   a. In the **Auto-discover period (hours)** field, select the frequency with which IBM Director Server attempts to discover service processors automatically. The possible range is one to 168 hours (seven days). By default, autodiscovery is disabled.
   b. In the **Presence Check period (minutes)** field, select the frequency that IBM Director Server checks the status of each service processor. A presence check detects whether an SNMP device is online or offline. The possible range is one to 240 minutes (four hours); this feature also can be disabled. By default, a presence check is set to occur every 15 minutes.
3. Specify the conventions that IBM Director Server uses when you rename service processors automatically. By default, this naming template is set to IBM %CHASSIS_MACHINE_TYPE_MODEL% %CHASSIS_SERIAL_NUMBER%.
   a. Click a parameter in the **Selected Parameters** field; then, click **Remove**. Continue until you have removed the default parameters.
   b. In the **Available Parameters** field, click a parameter; then, click **Add**. The parameter is added to the **Selected Parameters** list and the **Naming Template** field. Continue until you have selected all the parameters that you want to use.

   To restore the renaming conventions to the default setting, select the **Reset to default value** check box.

Discovering systems automatically

The Discover Systems task allows you to discover managed objects automatically. You can select to discover all managed objects or a particular type of managed object.

To discover systems, complete the following steps:

1. In the IBM Director Console, click **Tasks** → **Discover Systems**.
2. Click the type of system you want to discover:
   - All Managed Objects
   - BladeCenter Chassis
   - Level 0: Agentless Systems
   - Level 1: IBM Director Core Services Systems
   - Level 2: IBM Director Agents
   - Physical Platforms
   - SMI-S Storage Devices
   - SNMP Devices

Setting up software-distribution preferences

The Server Preferences window: Software Distribution page allows you to configure software distribution preferences such as the maximum number of managed systems to which you want to stream software packages concurrently and the bandwidth you want to assign to streaming software packages. You can also specify not to stream a package if a redirected distribution fails as well as restrict the server access check.

Complete the following steps to configure software-distribution preferences:

1. If necessary, start IBM Director Console.
2. Click **Options** → **Server Preferences**.
3. In the Server Preferences window, click the **Software Distribution** tab.
4. On the Software Distribution page, locate the **Maximum Managed Systems** field and type the maximum number of managed systems to which IBM Director Server can concurrently stream software packages. The default value is three.
5. To limit the bandwidth used to stream packages, select the **Enter streaming bandwidth (kbps) for managed systems** check box. In the entry field, type the bandwidth, in kilobytes per second (KBps), that you want to use to stream packages from either IBM Director Server or a file-distribution server to the managed system.

   Note: To specify values less than 1 KBps, type a decimal. The minimum acceptable value is 0.25 (256 bytes per second).
6. To avoid streaming a package in the event that a redirected distribution fails, select the **Do not stream distribution if redirected distribution fails** check box.
7. To prevent IBM Director Server from performing an access check of *all* of the file-distribution shares, select the **Restrict server access check** check box.

   This selection restricts the access check to *only* the file-distribution shares you configure for a specific managed system or group.
8. Click **OK**.

Setting up file-distribution servers

This topic describes how to set up file-distribution servers.

IBM Director supports UNC-based and FTP-based file distribution. See your server documentation for information about setting up a shared subdirectory.

Note: You do not need to install IBM Director on the file-distribution server.

See “File-distribution server considerations” on page 54 for more information.

Configuring IBM Director to use a file-distribution server

This topic describes how to configure IBM Director to use a file-distribution server to distribute software to Level-2 managed systems.

Complete the following steps to configure IBM Director Server to use a file-distribution server:

1. Start IBM Director Console.
2. Click **Options** → **Server Preferences**.
3. In the Server Preferences window, click the **File Distribution Server** tab. A list is displayed of all configured file-distribution servers.
4. Click **Add**.
5. In the Add Share Name window, type the name of the file-distribution server (using UNC notation) in the **Share Name** field. To specify FTP as the transport protocol, begin the share-name entry with `ftp:`, for example `ftp:\\ServerName\AccountName`.
6. In the **Maximum Disk Space** field, type the maximum amount of disk space (in MB) that can be allocated on the file-distribution server for software distribution.
7. In the **Maximum Managed Systems** field, type the maximum number of managed systems that can receive a software package at the same time.
8. To limit the bandwidth that can be used to send packages between IBM Director Server and the file-distribution server, select the **Limit bandwidth between server and share (kbps)** check box. In the entry field, type the maximum bandwidth, in kilobytes per second (KBps), that can be used to send packages between IBM Director and the file-distribution server.

   Note: You might want to limit the bandwidth when a dedicated connection, such as integrated services digital network (ISDN), is used for copying the files from IBM Director Server to the share.
9. If you specified an FTP-based server in step 5, you must provide information about the FTP server:
   a. In the **User ID on FTP** server field, type a user ID authorized to access the FTP server installed on the share.
   b. In the **Password** field, type the password associated with the user ID.
   c. In the **Confirm password** field, retype the password associated with the user ID.
   d. In the **Home Directory** field you can specify the directory where you want to cache software packages. If you do not specify a directory, the packages will be cached in the default home directory defined for the FTP user.

      Note: For i5/OS, you must specify a directory, or configure the FTP server to operate in regular mode. By specifying a directory, IBM Director automatically changes the FTP server to operate in regular mode.
10. Click **OK**.

If you have multiple file-distribution servers, repeat this procedure for each server.

Configuring distribution preferences for managed systems

This topic describes how to configure distribution preferences for managed systems.

After you configure IBM Director to use a file-distribution server, you can assign unique policies to a managed system and groups. By default, a managed system attempts to access all shares that have been defined to the management server. You can configure the following software-distribution preferences for a managed system or group:

- Restrict access to specific shares
- Specify whether software distribution occurs through streaming or redirected distribution
- Limit the bandwidth used for software distribution

Complete the following steps to define distribution preferences:

1. If necessary, start IBM Director Console.
2. In the Group Contents pane, right-click the managed system or group.
3. Click **Distribution Preferences**.
4. In the Distribution Preferences window, select the method of software distribution:
   - If you want to copy packages directly from IBM Director Server to the managed system or group, click **Always stream to the Managed System(s)**.
   - If you want to copy packages from a share to the managed system or group, click **Use File Distribution Server Shares**.

   Note: If a file-distribution server share cannot be located during a software distribution when you have selected **Use File Distribution Server Shares**, the default action is to stream the package from IBM Director Server. You can prevent streaming from IBM Director Server by selecting **Do not stream if redirection fails** in the Software distribution server preferences.
5. To add a share, click **Add**.
6. In the Add Share Name window, in the **Share Name** field, select the share. If necessary, specify a user ID and password for an account that can access the share.
7. Click **OK**.
8. Repeat steps 5 through 7 until you have added all of the shares that you want the managed system or group to access.
9. If you want to limit the shares that the managed system or group can access to only those displayed, select the **Restrict share selection to list** check box.

   Note: Windows only: If you select to use a file-distribution server share and specify a user id and password with which to distribute the package, rather than using null credentials, the **Stream from File Distribution Server** check box must be selected for a distribution to complete successfully. This applies to packages created with the IBM Update Assistant, InstallShield Package, or Microsoft Windows Installer Package wizards.
10. To limit the bandwidth that is used when copying packages, select the **Limit streaming bandwidth for system** check box.

    If you have selected **Always stream to system**, type a bandwidth value, in kilobytes per second (KBps), to define the bandwidth that is used to copy packages from IBM Director Server to the managed system or group. If a bandwidth limitation is also set in Server Preferences for streaming from the IBM Director Server, the lower value of the two settings is used as the limitation parameter.

If you have selected **Use File Distribution Server Shares**, in the entry field, type a bandwidth value to define the bandwidth that is used to copy packages from the file-distribution server share to the managed system or group. If a file-distribution server share is unavailable at the time of distribution, the package is streamed from IBM Director Server; this bandwidth value is used to stream the package, unless a more restrictive bandwidth value has been set in Server Preferences for Software Distribution.

Chapter 4. Uninstalling IBM Director

This topic provides procedures for uninstalling IBM Director.

You can use the following procedures to uninstall IBM Director.

Note: You can retain the configuration data when you uninstall IBM Director. This enables you to reinstall or upgrade IBM Director and access the saved configuration data. Should you reinstall, be sure to reinstall IBM Director in the same location.

Uninstalling IBM Director on i5/OS

Use this information to uninstall the IBM Director components that are installed on your i5/OS systems.

Uninstalling IBM Director Server on i5/OS

This topic describes how to uninstall IBM Director Server on i5/OS using the IBM Virtualization Engine Uninstaller Launchpad.

Note: To uninstall IBM Director Server, you must connect to the server running i5/OS from a system running Windows. The system running Windows must have JRE, version 1.4 or later installed.

Complete the following steps to uninstall IBM Director Server running on i5/OS:

1. If you have not done so already, map a drive on the system running Windows to connect to the /QIBM/ProdData/VE2 directory on the management server that is running i5/OS.
2. On the Windows system, type `X:` at a command prompt and press **Enter**, where *X* is the drive letter that you have mapped to the /QIBM/ProdData/VE2 directory.
3. When the command prompt changes to *X*:\>, type the following command and press **Enter** to start the IBM Virtualization Engine Uninstaller Launchpad:
   ```
   uninstallVEi5OS.bat
   ```
4. When the IBM Virtualization Engine Uninstaller Launchpad opens, select IBM Director Server in the list of products to uninstall and click **Uninstall**.
5. When the uninstall is complete, the Messages area will display, `Uninstall completed for Director.`
6. To remove IBM Director user data from the i5/OS management server, delete the /qibm/userdata/director/ directory. You can use the following Qshell command:
   ```
   rm -rf /qibm/userdata/director/
   ```

Uninstalling IBM Director Server using DLTLICPGM

If you **do not** operate in an IBM Virtualization Engine environment, you can uninstall IBM Director Server using DLTLICPGM.

Important: If you installed IBM Director Server using the Virtualization Engine installation wizard, but choose to uninstall IBM Director Server using DLTLICPGM, the configuration change will not be updated in the Global Configuration Repository.

To uninstall IBM Director Server using DLTLICPGM, complete the following steps:

1. At an i5/OS command prompt on the system where IBM Director Server is installed, type the following command and press Enter.
   ```
   DLTLICPGM LICPGM(5722DR1)
   ```
2. To remove IBM Director user data from the i5/OS management server, delete the /qibm/userdata/director/ directory. You can use the following Qshell command:
   ```
   rm -rf /qibm/userdata/director/
   ```

Uninstalling IBM Director Agent on i5/OS

You can uninstall IBM Director Agent using DLTLICPGM.

To uninstall IBM Director Agent using DLTLICPGM, complete the following steps:

1. At an i5/OS command prompt on the system where IBM Director Agent is installed, type the following command and press Enter.
   ```
   DLTLICPGM LICPGM(5722DA1)
   ```
2. To remove IBM Director user data from the i5/OS managed system, delete the /qibm/userdata/director/ directory. You can use the following Qshell command:
   ```
   rm -rf /qibm/userdata/director/
   ```

Uninstalling IBM Director on Linux or AIX

This topic describes how to uninstall IBM Director from a system that is running Linux or AIX.

Use the diruninstall script to uninstall IBM Director on Linux for System p5 and pSeries, Linux for xSeries, Linux for System z9 and zSeries, or AIX. This script is located in the /opt/ibm/director/bin directory. By default, this script removes all IBM Director components. You can modify the script to remove specific components.

- To uninstall IBM Director and all components, type the following command and press **Enter**:
  ```
  /opt/ibm/director/bin/diruninstall
  ```
- To uninstall specific components, perform the following steps:
  1. Open the diruninstall script in an ASCII text editor and set the SmartUninstall setting to 0.
  2. Make additional modifications to the script.
  3. Save the modified diruninstall script.
  4. Type the following command and press **Enter**:
     ```
     /opt/ibm/director/bin/diruninstall
     ```

  Notes:

  - If you are going to uninstall a specific component, you must stop the component first.

  - (Linux on POWER only) If you did not install IBM Director Core Services, you must remove IBM Director components using standard RPM commands (by default, IBM Director Core Services is installed when IBM Director Server or IBM Director Agent are installed).
  - (AIX only) If you installed IBM Director Agent on a system that does not have IBM Director Server installed, you must uninstall the component using the instructions provided in "Uninstalling IBM Director Agent on AIX" on page 326.
- You also can uninstall IBM Director on Linux using standard RPM commands or on AIX using the System Management Interface Tool (SMIT). Consider the following information:
  - Uninstall any IBM Director extensions *before* uninstalling IBM Director Server, IBM Director Console, IBM Director Core Services, or IBM Director Agent.
  - If an IBM Director database is configured, you must delete the tables and remove the IBM Director database configuration. Perform this task *after* all other packages are removed but *before* uninstalling IBM Director Server. From a command prompt, type the following command and press **Enter**:

    ```
    /opt/ibm/director/bin/uncfgdb
    ```

  When you uninstall packages on Linux, the following files are retained to make it possible to restore persistent data:
  - /opt/ibm/director.save.1/saveddata.tar
  - /etc/ibm/director/twgagent/twgagent.uid

Uninstalling IBM Director on Windows

This topic describes how to uninstall IBM Director on a system that is running Windows.

You can uninstall IBM Director either by using the Windows Add/Remove Programs feature or from a command-line prompt. You can use both of these methods to uninstall IBM Director Server, IBM Director Console, IBM Director Core Services, or IBM Director Agent.

You must uninstall any separately installed IBM Director extensions *before* uninstalling IBM Director Server, IBM Director Console, or IBM Director Agent.

Uninstalling IBM Director using the Windows Add/Remove Programs feature

This topic describes how to uninstall IBM Director using the Windows Add/Remove Programs feature.

Complete the following steps to uninstall IBM Director:

1. Shut down all applications.
2. Click **Start** → **Settings** → **Control Panel**. The Control Panel window opens.
3. Double-click **Add/Remove Programs**. The Add/Remove Programs window opens.
4. Click the IBM Director software component that you want to remove; then, click **Remove**.
5. Follow the instructions on the screen.

Uninstalling IBM Director using the dirunins command

This topic describes how to uninstall IBM Director using the dirunins command.

From a command-line prompt, type the following command and press **Enter**:

```
dirunins directorcomponent option
```

The following table contains information about the possible values for *option* and *directorcomponent*.

Table 120. dirunins parameters

Variable	Parameter	What it does
option	debug	Logs all messages that are sent by the Windows Installer log engine, including status and information messages
	deletedata	Deletes all configuration data. This parameter must be used in conjunction with silent or unattended parameter. For example, `dirunins agent unattended deletedata` performs an unattended uninstallation of IBM Director Agent and deletes IBM Director configuration data.
	log=*logfilename*	Specifies the fully qualified name of an alternative installation log file
	noreboot	Suppresses any required restart
	silent	Suppresses all output to the screen
	unattended	Shows the progress of the uninstallation but does not require any user input
	verbose	Enables verbose logging
directorcomponent	server	Uninstalls IBM Director Server and any installed IBM Director extensions
	console	Uninstalls IBM Director Console and any installed IBM Director extensions
	agent	Uninstalls Level 2: IBM Director Agent
	coresvcs	Uninstalls Level 1: IBM Director Core Services

Note: If you are uninstalling IBM Director Agent or IBM Director Core Services, you must uninstall any installed IBM Director extensions first.

Uninstalling IBM Director Agent on AIX

This topic describes how to uninstall IBM Director Agent on AIX.

To uninstall IBM Director Agent on a system running AIX, perform the following steps:

1. To stop IBM Director Agent, from a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
2. Type the following command and press **Enter**:
   ```
   installp -u -X IBM.Director.Agent.IBMDirA
   ```
3. Type the following command and press **Enter**:
   ```
   installp -u -X IBM.Director.DirectorCimCore
   ```

Uninstalling IBM Director Agent on NetWare

This topic describes how to install IBM Director Agent on NetWare.

Complete the following steps to uninstall IBM Director Agent on NetWare:

1. From the server running NetWare, change to the console screen.
2. Type the following command and press **Enter**:
   ```
   unload twgipc
   ```
3. Type the following command and press **Enter**:
   ```
   nwconfig
   ```
   The Configuration Options screen opens.
4. Select **NCF Files Options**.
5. Select **Edit AUTOEXEC.NCF file**.
6. Remove the following lines from the autoexec.ncf file:
   ```
   :********IBM Director Agent********
   Search add sys:IBM\Director
   load twgipc
   :********IBM Director agent********
   ```
7. Save the modified autoexec.ncf file.
8. Shut down and restart the server running NetWare.
9. From a Windows workstation running the NetWare Client for Windows, map a drive to the SYS volume and delete the IBM\Director directory.

Uninstalling IBM Director Core Services before migrating to an earlier version of IBM Director

This topic discusses how to uninstall IBM Director Core Services and why this procedure is important when changing your installation to a pre-5.10 version of IBM Director.

When uninstalling IBM Director 5.10 in order to install an earlier version of IBM Director, users must be sure to uninstall all instances of IBM Director Core Services. On managed systems running Microsoft Windows, versions of IBM Director previous to 5.10 cannot detect whether or not IBM Director Core Services is installed, and will not warn users that this component of IBM Director 5.10 is present.

Note: Installing pre-5.10 versions of IBM Director, including IBM Director Agent, IBM Director Console, and IBM Director Server, on a system on which IBM Director Core Services is installed has the potential to cause problems. Before installing any pre-5.10 component of IBM Director, use the following procedure to uninstall IBM Director Core Services.

At a command prompt, type one of the following commands and press **Enter**.

Operating System	Command
Linux	`/opt/ibm/director/bin/diruninstall`
Microsoft Windows	`dirunins coresvcs unattended deletedata`

IBM Director Core Services is uninstalled.

Chapter 5. Modifying an IBM Director installation

Enabling the Wake on LAN feature

If your server supports the Wake on LAN feature, you can enable it after IBM Director is installed. See your server documentation to determine whether or not your server supports this feature.

Enabling the Wake on LAN feature for Linux or AIX

This topic describes how to enable the Wake on LAN feature for IBM Director Agent.

Complete the following steps to enable Wake on LAN for IBM Director Agent:

1. To stop IBM Director Agent, from a command prompt, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstop
   ```
2. Open an ASCII text editor and edit the ServiceNodeLocal.properties file. This file is in the /opt/ibm/director/data directory.
3. Modify the value of ipc.wakeonlan to read as follows:
   ```
   ipc.wakeonlan=1
   ```
4. Save and close the ServiceNodeLocal.properties file.
5. To start IBM Director Agent, type the following command and press **Enter**:
   ```
   /opt/ibm/director/bin/twgstart
   ```

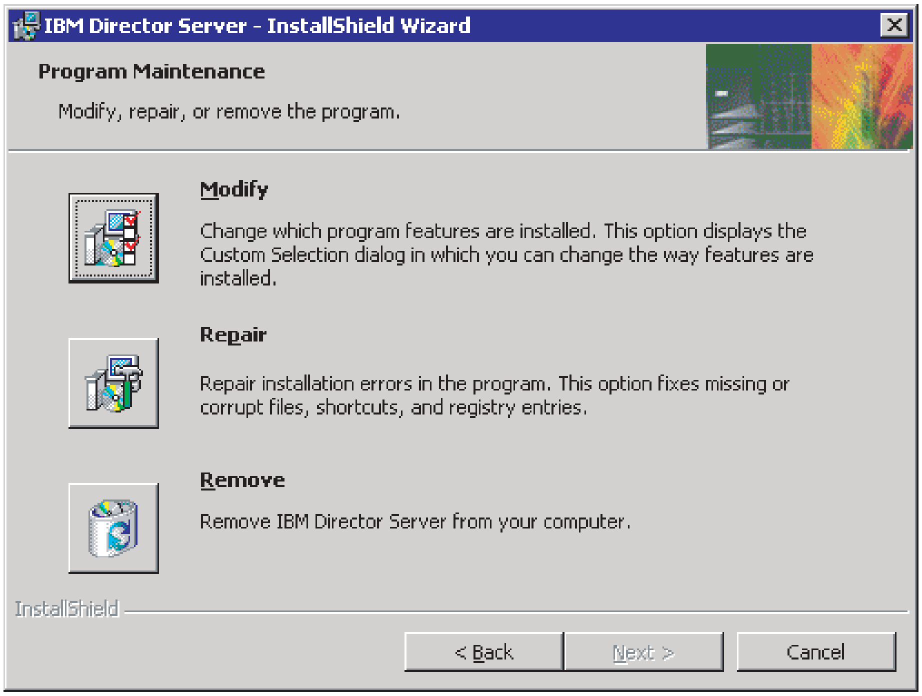
Enabling the Wake on LAN feature on Windows

This topic describes how to enable Wake on LAN on a managed system running windows.

Note: To determine whether your server supports the Wake on LAN feature, see your server documentation.

Complete the following steps to enable Wake on LAN:

1. Click **Start Settings > Control Panel**. The ″Control Panel″ window opens.
2. Double-click **Add/Remove Programs**. The ″Add/Remove Programs″ window opens.
3. Click the IBM Director software component that you want to modify; then, click **Change**. The InstallShield wizard starts, and the ″Welcome to the InstallShield Wizard″ window opens.
4. Click **Next**. The ″Program Maintenance″ window opens.


IBM Director Server - InstallShield Wizard

Program Maintenance

Modify, repair, or remove the program.

Modify

Change which program features are installed. This option displays the Custom Selection dialog in which you can change the way features are installed.

Repair

Repair installation errors in the program. This option fixes missing or corrupt files, shortcuts, and registry entries.

Remove

Remove IBM Director Server from your computer.

Figure 60. "Program Maintenance" window

5. Click **Modify**; then, click **Next**.
6. Continue through the wizard until you reach the ″Network driver configuration″ window.
7. Select the Enable Wake on LAN check box.
8. Complete the wizard.

Configuring the database on the management server

This topic describes how to configure the database after IBM Director Server is installed.

Configuring the database on Linux or AIX

This section describes how to configure your database application for use with IBM Director after IBM Director Server is installed. These instructions are applicable for all Linux platforms and AIX.

Configuring the database on a Linux or AIX management server using the cfgdb command

This topic describes how to configure the database after IBM Director Server is installed using the cfgdb command.

Note: The cfgdb command must be used in a graphical environment. To configure the database from a command line, see "Configuring the database on a Linux or AIX management server using the cfgdbcmd command" on page 331.

Complete the following steps to install and configure a database after you have installed IBM Director Server:

1. To stop IBM Director Server, from a command prompt, type the following command and press **Enter**:

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

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

   ```
   /opt/ibm/director/bin/cfgdb
   ```
3. Follow the instructions on the screen.
4. To restart IBM Director Server, type following command and press **Enter**:

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

Configuring the database on a Linux or AIX management server using the cfgdbcmd command

This topic describes how to configure the database from a command line after IBM Director Server is installed.

Complete the following steps to install and configure a database from the command line after you have installed IBM Director Server:

1. Open the cfgdbcmd.rsp file in an ASCII text editor and modify the settings. The cfgdbcmd.rsp file is located in the /opt/ibm/director/data directory and is fully commented.
2. Save the modified response file with a new file name.
3. To stop IBM Director Server, from a command prompt, type the following command and press **Enter**:

   ```
   /opt/ibm/director/bin/twgstop
   ```
4. Type the following command and press **Enter**:

   ```
   cfgdbcmd -rspfile response.rsp
   ```

   where *response.rsp* is the name of the response file as saved in step 2.
5. When the configuration is completed, restart IBM Director Server. Type following command and press **Enter**:

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

Configuring the database on a Windows management server

This topic describes how to configure the database after IBM Director Server is installed.

Complete the following steps to configure a database after you have installed IBM Director Server:

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

   ```
   net stop twgipc
   ```
2. Type the following command and press Enter:

   ```
   cfgdb
   ```

   The “IBM Director database configuration” window opens.
3. Follow the instructions on the screen.

Note: For the Database Configuration window to accept Windows color settings after installation, you must first go to the **Accessibility Preferences** tab in the **Console Preferences** window, and select the Windows option in the **Colors** field.

Enabling SNMP access and trap forwarding for Linux

This topic describes how to enable SNMP access and trap forwarding for Linux.

To enable SNMP access and trap forwarding on Linux, you must be running one of the following operating systems:

- i5/OS, Version 5 Release 3
- Red Hat Linux, version 3.0
- Red Hat Linux, version 4.0
- SUSE LINUX Enterprise Server 8 for x86
- SUSE LINUX Enterprise Server 9 for x86
- 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

Note: IBM Director 5.10 supports SNMP access and trap forwarding using NetSNMP version 5.2.1 (all releases). You must remove all NetSNMP libraries older than version 5.2.1 from your system before completing the steps in this task. Ensure that no net-snmp, net-snmp-libs or net-snmp-devel rpms older than version 5.2.1 remain on your system.

Complete the following steps to enable SNMP access and trap forwarding for managed systems running Linux:

1. Download the net-snmp-5.2.1.tar.gz file from the Net-SNMP Web site at http://www.net-snmp.org/download.html.

   Note: Net-SNMP is not supported on VMware console operating systems.
2. Build and install Net-SNMP. Refer to the INSTALL and README files included in the net-snmp-5.2.1.tar.gz package for instructions. If you are not running an AMD64 or EM64T distribution, go to step 4.
3. (AMD64 and EM64T distributions only) SNMP functionality on these systems requires 32-bit versions of the NetSNMP libraries for use by the IBM Director SNMP SubAgent. The NetSNMP Master Agent can use the native 64-bit libraries.

   You can request the 32-bit libraries from your Linux distribution provider or compile them yourself. If you compile the libraries yourself, it is strongly recommended that you run the configuration using the `—without-rpm` command option.

   Compile the libraries in one of the following ways:
   - Using 32-bit compiler flags (not tested with NetSNMP).
   - Compile on a 32-bit version of the Linux distribution and then move the libraries to your 64-bit system.

   Copy the 32-bit libraries to the ibm/director/cimom/lib directory or to another location on your system library path.

   Important: If you are using a 64-bit installation of the NetSNMP Master Agent, ensure that the 32-bit libraries do not interfere with the 64-bit libraries used by the Master Agent. You must only include one library in the library search path.
4. Configure the Net-SNMP agent using one of the following methods:

   Note: The Agent Operating mode must be set to AgentX Master Agent.
   - Use the **snmpconf** utility to change the Agent Operating mode to AgentX Master Agent and to configure Net-SNMP for access groups and trap destinations.

- To configure Net-SNMP manually, open the snmpd.conf file in an ASCII text editor and locate the following section of text:

  ```
  # master: Should the agent operate as a master agent or not.
  # Currently, the only supported master agent type for this token
  # is "agentx".
  #
  # arguments: (on|yes|agentx|all|off|no)
  master agentx
  ```

  Uncomment the `master agentx` string by removing the hash mark (#) if necessary and save the modified file.

5. Ensure that the LD_LIBRARY_PATH environment variables in the dacimlist and dasnmp start-up scripts include the following path information:
   - /usr/local/lib
   - /opt/ibm/director/lib
   - /opt/ibm/director/cimom/lib

   You can configure this information in either of the following ways:
   - Create a *filename*.sh file in the /etc/profile.d/ directory, where *filename* is a name of your choice. Include the following text in the file (all on one line):

     ```
     export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/lib:/opt/ibm/director/lib:
      /opt/ibm/director/cimom/lib
     ```
   - Create a *filename*.conf file in the /etc/ld.so.conf.d/ directory, where *filename* is a name of your choice. Include the following text in the file

     ```
     /usr/local/lib
     /opt/ibm/director/lib
     /opt/ibm/director/cimom/lib
     ```
6. Ensure that the SNMPCONFPATH environment variables in the dacimlist and dasnmp start-up scripts include the path for the location of the snmpd.conf file. You can configure this variable by creating a *filename*.conf file in the /etc/profile.d/ directory, where *filename* is a name of your choice. Include the following text in the file:

   ```
   export SNMPCONFPATH=$SNMPCONFPATH:/path
   ```

   where *path* is the path for the snmpd.conf file.

Chapter 6. Troubleshooting

Use this section to troubleshoot and resolve problems with IBM Director.

Installation troubleshooting

Use this section to troubleshoot and resolve problems with IBM Director installation.

For additional troubleshooting information, see the *IBM Director Release Notes*.

Could not detect *rpm* supported Linux distribution

This problem only affects systems running Linux.

Problem

When installing IBM Director Core Services, IBM Director Agent, or IBM Director Server, the following error message might be generated:

```
Could not detect rpm supported Linux distribution
```

where *rpm* is one of the following RPMs:

- DirectorCimCore
- xSeriesCoreServices-level1
- pSeriesCoreServices-level1

Investigation

This message occurs if you install IBM Director components on a Linux distribution that is not supported by the DirectorCimCore, xSeriesCoreServices-level1, and pSeriesCoreServices-level1 RPMs.

To correct the problem, install a supported Linux distribution. See *IBM Director Installation and Configuration Guide*.

depmod: *** Unresolved symbols in /lib/modules/2.4.7-10smp/kernel/drivers/char/

This problem only affects systems running Red Hat Linux.

Problem

If you install the IBM SMbus or LM78 device driver, a warning message similar to the following might be recorded in the Bootmsg.log file:

```
depmod: *** Unresolved symbols in /lib/modules/2.4.7-10smp/kernel/drivers/
char/driver.o
```

where *driver* is either ibmsmb or ibmlm78.

Investigation

This warning message is generated if the Red Hat Linux kernel was compiled with versioned symbols enabled. Ignore this message; the device driver loaded and will operate properly.

Error 1722 is displayed

This problem affects IBM Director Server and IBM Director Console. It occurs only on systems running Windows.

Problem

When you install IBM Director, the following message is displayed:

```
Error 1722. There is a problem with this Windows Installer package. A
program run as part of the setup did not finish as expected. Contact your
support personnel or package vendor.
```

Investigation

The monitor for a system running IBM Director Server or IBM Director Console must support at least 256 colors.

To correct this problem, increase the display color palette to more than 256 colors, uninstall the partial installation, and reinstall IBM Director Server.

Installing IBM Director 4.2x over IBM Director 5.10

This problem affects IBM Virtualization Engine Systems Edition for iSeries installations.

Problem

After you have installed IBM Director 5.10 (5722-DR1 or 5722-DA1) on a system as part of IBM Virtualization Engine Systems Edition for iSeries, you must completely uninstall IBM Director 5.10 before installing the previous version, IBM Director Multiplatform 4.2x (5733-VE1 option 30 or 39).

If attempted, IBM Director 5.10 is disabled and IBM Director Multiplatform 4.2x does not work (twgstart will fail).

Investigation

To correct this problem, complete the following steps:

1. Uninstall IBM Director Multiplatform 4.2x (5733-VE1 option 30 or 39).
2. Complete the manual cleanup described in the Virtualization Engine Information Center > eServer Software Information Center at: http://publib.boulder.ibm.com/infocenter/eserver/v1r1/en_US/info/veicinfo/eicarmanualuninstall.htm#eicarmanualuninstall.
3. Install only one of the following releases:
   - IBM Director 5.10 (5722-DR1 or 5722-DA1)
   - IBM Director Multiplatform 4.2x (5733-VE1 option 30 or 39)

Installation package cannot be installed by Windows Installer service

This problem affects systems with a version of Windows Installer (MSI) that is earlier than version 3.0. This problem occurs only on systems running Windows 2000, Windows XP with no service packs, or Windows XP with Service Pack 1.

Problem

During a Windows Installer administrative installation, the following message is displayed:

```
This installation package cannot be installed by
Windows Installer service. You must install a Windows
service pack that contains a newer version of the
Windows Installer service.
```

Investigation

To correct this problem and perform Windows Installer administrative installation, complete the applicable procedure.

- If you are installing a Web-downloadable extension, type the following command:

  ```
  filename.exe -a admin
  ```

  where *filename* is the name of the Web-downloadable extension installation file.
- If you are installing IBM Director Server, IBM Director Console, IBM Director Agent, or IBM Director Core Services from the *IBM Director* CD, complete the following steps:
  1. On the *IBM Director* CD, change to the directory for the IBM Director component that you want to install.
  2. Type one of the following commands:

     ```
     filename.exe -a admin
     ```

     where *filename* is the name of the IBM Director component installation file.

Note: If the system that is running the administrative installation has a version of MSI that is earlier than version 3.0, these commands update MSI on that system. After MSI is updated and the administrative installation is completed, a message is displayed that you must reboot the system. Be sure to do so.

System Availability reports an unplanned outage when a system is restarted

This problem only affects systems running Red Hat Enterprise Linux AS, versions 2.1 and 3.0.

Problem

System Availability reports an unplanned outage when a Level-2 managed system is restarted.

Investigation

To avoid this problem, after installing System Availability, be sure to stop and restart IBM Director Agent before you restart the managed system.

Windows blue screen IRQL_NOT_LESS_OR_EQUAL

This problem affects IBM Director Agent. It occurs only on systems running Windows Server 2003.

Problem

During installation of IBM Director Agent, Windows might display the following blue screen trap:

```
IRQL_NOT_LESS_OR_EQUAL
```

Investigation

This problem is solved by a Microsoft update. See Microsoft Knowledge Base Article 825236 for more information.

Contacting customer support

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

Before you call

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

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

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

Using the documentation

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

Getting help and information from the World Wide Web

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

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Appendix A. Worksheets

This topic contains worksheets you can use to plan your IBM Director environment.

Worksheet: Environment

This topic contains a worksheet that you can use to record information about the environment that you want to manage with IBM Director.

Hardware to be managed with IBM Director

Value	Description	Answer
Desktop and mobile computers	Descriptions of supported hardware, network protocols, ports, and operating systems for management with IBM Director are available in the following topics: • "Hardware requirements" on page 81 • "Network requirements" on page 84 • "Supported operating systems" on page 86	Yes □ No □
IBM eServer BladeCenter units		Yes □ No □
iSeries systems		Yes □ No □
System p5 and pSeries systems		Yes □ No □
xSeries systems		Yes □ No □
ServeRAID controllers on xSeries systems		Yes □ No □
Service processors on xSeries systems		Yes □ No □
SNMP devices		Yes □ No □
SMI-S storage devices		Yes □ No □
System z9 and zSeries systems		Yes □ No □

Local and remote subnets (discovery parameters)

Value	Description	Answer
Unicast Addresses for Level-0 discovery	IP addresses or IP-address ranges for unicast discovery of Level-0 ("Agentless") managed systems.	___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___
Directory agent server for Level-1 discovery	Service Location Protocol (SLP) directory agent server for discovery of Level-1 managed systems.	
SLP scope for Level-1 discovery	Service Location Protocol (SLP) scope for discovery of Level-1 managed systems.	

Value	Description	Answer
Unicast Addresses for Level-2 discovery	IP addresses or IP-address ranges for unicast discovery of Level-2 managed systems.	___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___ ___.___.___.___ - ___.___.___.___
Subnets for Level-2 discovery	TCP/IP addresses and subnet masks for broadcast and relay discovery of Level-2 managed systems.	___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___
Multicast group for Level-2 discovery	Multicast group TCP/IP address and time-to-live value for multicast discovery of Level-2 managed systems.	multicast group: ___.___.___.___ time to live: _______
Subnets for discovery of SNMP devices	TCP/IP addresses and subnet masks for discovery of simple network management protocol (SNMP) devices.	___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___ ___.___.___.___ / ___.___.___.___
Community names for discovery of SNMP devices	Community names for discovery of simple network management protocol (SNMP) devices.	________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________
SLP profiles for discovery of SMI-S storage devices	Service Location Protocol (SLP) profiles for discovery of SMI-S devices.	________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________ ________________________________

Worksheet: Capacity Manager space requirements

This topic contains a worksheet that you can use to estimate the disk space required by Capacity Manager.

Use the following worksheet to estimate the disk space required for Capacity Manager data.

a =	Number of managed systems
	Real-time slt data collection
b =	Data-collection frequency (in minutes)
c =	Number of days to keep on the server
d =	KB required: (a × c × 42.19) ÷ b
	Trend slt data collection
e =	Data-collection frequency (in minutes)
f =	Number of days to keep on the server
g =	KB required: (a × f × 42.19) ÷ e
	Report generation
h =	Number of daily reports generated
i =	Number of hourly reports generated
j =	KB required: (a × h × 16.77) + (a × i × 71.73)
	Total space required
k =	KB required: d + g + j

Worksheet: Database planning

This topic contains a worksheet that you can use to help plan the database for IBM Director Server.

	AIX	i5/OS	Linux	Windows
Apache Derby	local	-	local	local
IBM DB2	local or remote	local	local or remote	local or remote
Microsoft Data Engine (MSDE) 2000 (aka Microsoft SQL Server 2000 Desktop Engine)	-	-	-	local
Microsoft SQL Server 2000	-	-	remote	local or remote
Oracle Server	local or remote	-	local or remote	local or remote
PostgreSQL	-	-	local or remote	-

Selected database application

Server on which database will be installed

Server on which IBM Director will be installed

Worksheet: Apache Derby database configuration

This topic contains a worksheet that you can use to gather required information for configuring the database for IBM Director Server.

This information may be used to configure the database using the wizard during installation, or to set options in a database-configuration response file for use with the **cfgdbcmd** command.

Database configuration attribute	Value	Description
DbmsApplication	Apache Derby	The selected database application.

Worksheet: DB2 database configuration

This topic contains a worksheet that you can use to gather required information for configuring the database for IBM Director Server.

This information may be used to configure the database using the wizard during installation, or to set options in a database-configuration response file for use with the **cfgdbcmd** command.

Database configuration attribute	Value	Description
DbmsApplication	DB2	The selected database application.
DbmsTcpIpListenerPort	50000	The TCP/IP listener port for the database.
DbmsServerName		The server name on which the database is located.
DbmsDatabaseName		The database name.
DbmsUserId		The user ID for the database.
DbmsPassword		The password for the database.

Worksheet: Oracle database configuration

This topic contains a worksheet that you can use to gather required information for configuring the database for IBM Director Server.

This information may be used to configure the database using the wizard during installation, or to set options in a database-configuration response file for use with the **cfgdbcmd** command.

Database configuration attribute	Value	Description
DbmsApplication	Oracle	The selected database application.
DbmsTcpIpListenerPort	1521	The TCP/IP listener port for the database.
DbmsServerName		The server name on which the database is located.
DbmsDatabaseName		The database name.
DbmsUserId		The user ID for the database.

Database configuration attribute	Value	Description
DbmsPassword		The password for the database.
DbmsAdminId		The administrator user ID for the database.
DbmsAdminPassword		The administrator password for the database.
DbmsTableName	IBM_DIRECTOR_DATA_TS	The table space name for the database.
DbmsTableFile	IBM_DIRECTOR_DATA_DF	The table space datafile for the database.
DbmsTableFileSize	500	The table space size.
DbmsTempTableName	IBM_DIRECTOR_TEMP_TS	The temporary table space name for the database.
DbmsTempTableFile	IBM_DIRECTOR_TEMP_DF	The temporary table space datafile for the database.
DbmsTempTableFileSize	50	The temporary table space size.

Worksheet: PostgreSQL database configuration

This topic contains a worksheet that you can use to gather required information for configuring the database for IBM Director Server.

This information may be used to configure the database using the wizard during installation, or to set options in a database-configuration response file for use with the **cfgdbcmd** command.

Database configuration attribute	Value	Description
DbmsApplication	PostgreSQL	The selected database application.
DbmsTcpIpListenerPort	5432	The TCP/IP listener port for the database.
DbmsServerName		The server name on which the database is located.
DbmsDatabaseName		The database name.
DbmsUserId		The user ID for the database.
DbmsPassword		The password for the database.

Worksheet: Microsoft SQL Server database configuration

This topic contains a worksheet that you can use to gather required information for configuring the database for IBM Director Server.

This information may be used to configure the database using the wizard during installation, or to set options in a database-configuration response file for use with the **cfgdbcmd** command.

Database configuration attribute	Value	Description
DbmsApplication	Microsoft SQL Server	The selected database application.
DbmsTcpIpListenerPort	1433	The TCP/IP listener port for the database.
DbmsServerName		The server name on which the database is located.
DbmsDatabaseName		The database name.
DbmsUserId		The user ID for the database.
DbmsPassword		The password for the database.

Worksheet: Installing IBM Director Server

This topic contains a worksheet that you can use to record the options you will select when you install IBM Director Server.

Optional features	BladeCenter Management	Yes □	No □
	Capacity Manager	Yes □	No □
	Rack Manager	Yes □	No □
	Remote Control Agent	Yes □	No □
	Software Distribution (Premium Edition)	Yes □	No □
	z/VM Center	Yes □	No □
Installation location			
Service account information	Computer name:		
	User name:		
	Password:		
Encryption	Enable encryption	Yes □	No □
	Encryption algorithm:	Advanced Encryption Setting □	
		Data Encryption Setting □	
		Triple DES □	
Software-distribution packages	Location for packages created by IBM Director Server:		
	Location for packages received by IBM Director Server:		
Network settings	Enable all NICs	Yes □	No □
	Network timeout:		
	Enable Wake on LAN	Yes □	No □
Remote control options	Require user authorization for system access	Yes □	No □
	Disable screen saver	Yes □	No □
	Disable background wallpaper	Yes □	No □

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Abbreviations, Acronyms, and Glossary

Abbreviation and acronym list

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

Table 121. 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
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

Table 121. Abbreviations and acronyms used in IBM Director documentation (continued)

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

Table 121. Abbreviations and acronyms used in IBM Director documentation (continued)

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

Table 121. Abbreviations and acronyms used in IBM Director documentation (continued)

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.
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- 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*.

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