IBM

IBM Systems Director 6.1

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1.0 Abstract

Virtualization has completely transformed enterprise-class IT. Virtualized solutions unlock technological resources, such as processing power and storage, from specific hardware, redelivering them in a fluid form that can be allocated dynamically to business goals and strategies in real time.

Next-generation virtualized infrastructures, however, require next-generation management tools. Older tools generally lack the modern feature set and focus required to achieve the highest performance and most flexible response from virtualized solutions. As a result, the overall business value that these outdated tools generate is also suboptimal. Furthermore, when different tools are used to manage different virtual technologies, management complexity increases. A superior solution would empower administrators to manage both virtual servers and virtual storage under a single pane of glass.

IBM® Systems Director 6.1 is such a solution. With Systems Director, the underlying technical differences across different hardware and software virtual solutions are abstracted out, allowing administrators to manage the overall virtualized infrastructure as a unified whole. Additionally, through its next-generation feature set—extensible via a plug-in architecture—Systems Director can help you to accomplish more through virtualization than ever before.

The bottom-line results? Simplified management; faster time-to-solution in the event of a problem; higher return on investment; a tailored fit between features, functions and the specific needs of your organization; and an accelerated, more flexible response to changing business goals and strategies. In short, Systems Director helps you to achieve the full potential of virtualization.

Among other key features, Systems Director:

- *Unifies the management of IBM systems, delivering a consistent look and feel for common management tasks.*
- *Manages non-IBM x86-based systems through a dedicated agent.*
- *Integrates IBM's best-of-breed virtualization capabilities to provide new and radically improved ways to simplify the management of physical and virtual platform resources.*
- *Provides multi-system support for IBM Power™, System x™, System z®, BladeCenter® and storage systems.*
- *Provides an extendable and modular foundation to advance the core systems management capabilities with additional plug-ins.*
- *Enables seamless integration of IBM systems with the total infrastructure.*
- *Facilitates reduced training costs by means of a consistent and unified platform management foundation.*

2.0 Overview

What is Systems Director?

Systems Director is a platform management foundation that streamlines the way physical and virtual systems are managed across a heterogeneous environment. By leveraging industry standards, Systems Director supports multiple operating systems and virtualization technologies across IBM and non-IBM platforms. Through a single user interface, Systems Director provides consistent views for visualizing managed systems, determining how these systems relate to one another and identifying their statuses, thus helping to correlate technical resources with business needs.

What's more, a set of common tasks included with Systems Director provides many of the core capabilities required for basic management, which means instant out-of-the-box business value. These common tasks include discovery, inventory, configuration, system health, monitoring, updates, event notification and automation across managed systems.

New in Systems Director 6.1:

- *Simplified deployment, installation and update process.*
- *Single point of control from a consistent Web-based user interface.*
- *Easy-to-learn new tasks with intuitive wizards, tutorials and integrated help.*
- *Topology views to simplify troubleshooting across server, storage and network resources.*
- *Streamlined lifecycle management of a virtual environment across multiple platforms.*
- *Increased platform support through leveraged industry standards.*
- *Support for embedded agents included with a platform or deployed by other systems management tools.*
- *A consistent access point to integrate and extend platform management throughout the infrastructure.*
- *Comprehensive system navigation through groups, search, status and relationships.*

Consistent user experience with common tasks

A key objective of Systems Director is to provide a consistent user interface focused on driving common tasks and accessible through both a Web-based interface and a command-line interface. To accomplish this, a set of scenarios was created to address the basic yet critical requirements for platform management. These scenarios are:

- *Discover, navigate and illustrate systems on the network, helping you to visualize detailed inventory and relationships among network resources.*
- *Identify problematic systems and drill down to the root cause.*
- *Identify systems requiring an update and orchestrate the installation process.*

- *Monitor systems in real time and set critical thresholds to notify administrators of emerging problems.*
- *Configure settings of a target system and create a configuration plan to apply these settings to similar systems.*
- *Update installed plug-ins to add new features and functions to the base capabilities.*

Plug-ins included with Systems Director

Base plug-ins provided with Systems Director deliver core capabilities to manage the full lifecycle of IBM server, storage, network and virtualization systems. The base plug-ins include:

- **Discovery Manager**—*Discovers virtual and physical systems and related resources.*
- **Status Manager**—*Provides health status, alerts and monitors of system resources.*
- **Update Manager**—*Notifies, downloads and installs updates for systems.*
- **Automation Manager**—*Performs actions based on system events.*
- **Configuration Manager**—*Configures one or more systems resource settings.*
- **Virtualization Manager**—*Creates, edits, relocates and deletes virtual resources.*
- **Remote Access Manager**—*Provides a remote console, a command line and file transfer features to target systems.*

Platforms supported with Systems Director

Because it leverages open standards, Systems Director supports both IBM and non-IBM platforms, driving common tasks through the following platform management plug-ins:

- **IBM Power Systems management**—*IBM Power Systems™ and resources, including:*
  — *HMC, IVM and VIOS appliances.*
  — *Power servers, Power blades and LS41 and QS21 blade servers.*
  — *AIX®, Linux®, and IBM i operating systems.*
- **BladeCenter and System x management**—*System x and BladeCenter Chassis resources, including:*
  — *All BladeCenter chassis and components, such as switch modules and server blades.*
  — *System x systems and X server blades.*
  — *VMware, Microsoft® Virtual Server and Xen virtual servers.*
  — *Windows and Linux for System x operating systems.*

- **System z mainframe management:** *System z and resources, including:*
  — *z/VM® hypervisor.*
  — *Linux for System z operating system installed on z/VM virtual servers or in Systems z logical partitions (LPARs).*
- **IBM Systems Storage management–***Storage systems and resources, including:*
  — *Integrated RAID Controller (such as LSI).*
  — *Network storage (DS3000, DS4000™ and DS6000™).*
  — *Storage switches (such as IBM BladeCenter SAS, Brocade, Qlogic, Nortel and Cisco).*

Additional features

Systems Director's plug-in architecture allows you to match specific technical functions to your unique business goals and requirements–all via the Systems Director interface, and all seamlessly integrated with related common tasks.
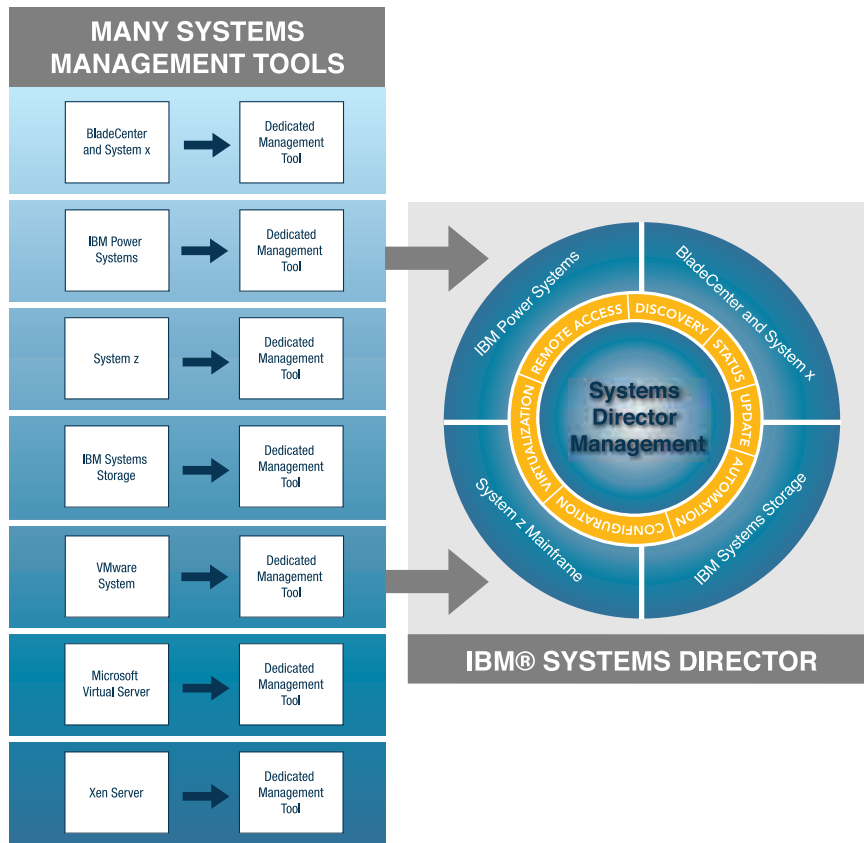
By acting as a single management tool to visualize and command many different resources throughout the virtualized infrastructure, Systems Director can help you to accomplish more than ever before, quickly and easily, transforming disparate virtual resources into a centralized, optimized engine of business productivity.

3.0 What's new?

Enhanced installation simplifies deployment and accelerates time-to-value

- *Base and custom installation options streamline the base installation of Systems Director's management server.*
- *Enhanced unattended installation of management servers.*
- *Automatic start of management server after successful installation.*
- *Forthcoming migration tool imports custom data from previous release.*

Web-based user interface with resource navigation for easy task management

- *Resource views of systems and groups show relationships between resources and list resource properties.*
- *Navigation links help you to quickly find and perform tasks.*
- *Nested groups and categories of resources.*
- *New wizards are available for common tasks, such as creating groups.*
- *Select key views to open automatically after sign-on.*
- *Targeted search to immediately work with specific resources and groups.*
- *Web 2.0 search for resources and tasks.*

Welcome page educates and informs administrators

- *Assistance getting started with Systems Director.*
- *Manage your data center and status for the installed plug-ins with summary views.*
- *Tutorial page with learning modules.*

Improved online help

- *A new help system is available with advanced search capabilities and an integrated table of contents. Organization and related links are now context-sensitive, showing only the panel you are currently viewing or the full help system.*

Advanced discovery and inventory features find and utilize resources

- *Simple-to-use basic discovery with progress indicator.*
- *Advanced system discovery with custom workflows for automatic endpoint authentication and inventory collection.*

Health summary view and status monitors track changes in the infrastructure

- *Scoreboard of number of systems with problems and compliance status.*
- *Consolidation of problem status for hardware and threshold monitors.*
- *Dashboard to view thumbnails of live data monitors for critical managed resources.*
- *LED status of System x and blade servers.*
- *Drill down from status indication.*
- *Extensibility for aggregating status from other plug-ins such as Service and Support Manager.*
- *Add thumbnails of desired groups for an at-a-glance summary of key resources.*

Event automation plans for faster, more consistent management

- *Simplified interface to trigger events automatically, such as e-mail notification or task execution.*
- *Common event schema more easily manages heterogeneous environments.*
- *New commands for managing event automation plans, event actions, event filters and event logs.*

Update management to drive compliance and cross-system consistency

- *Notifies the user of systems that are out-of-date based on default or customized compliance policies.*
- *Provides simplified tasks to download and install updates without repackaging or requiring each step in the process to be performed separately.*
- *Expands support from System x and BladeCenter to include Power, System z and Systems Director software.*

Enhanced security limits resource control to appropriate staff

- *Role-based access control.*
- *Instance-based authorization increases task granularity.*
- *Single sign-on allows administrators to view and edit credentials on specific managed resources.*
- *Credentials can be specified per protocol on a system.*
- *Enhancements for authorization through LDAP groups.*
- *New command line support for authorization.*

Configuration management speeds and simplifies setup

- *Enhanced support for IBM BladeCenter and IBM System Storage™ systems.*
- *Consistent interface and integration of operating-system configurations settings for network, user administration, SNMP agent settings and Asset ID™ tasks from previous release.*
- *Configuration Template can be created, viewed and edited on a per-system basis.*
- *Configuration Template can be integrated into configuration plans for mass, group-based configuration.*

Storage management integrates storage resources

- *Seamless integration of Storage Configuration Manager (SCM) standalone functionality and console launch integration of TotalStorage Productivity Center (TPC).*
- *Additional support for storage systems.*

Integrated virtualization management

- *Virtualization Manager 1.2, now included, delivers base functions for discovery, health and lifecycle tasks, such as creating, editing and relocating virtual servers.*
- *Consistent interface across multiple virtualization technologies, including PowerVM™, VMware, Microsoft Virtual Server and Xen.*
- *Views that show key relationships between hosts, virtual servers, guest operating systems and the storage/network resources they use.*
- *Additional monitors for virtual resources.*

New remote console

- *Several new tools are available for performing remote tasks, including integrated support for launching Virtual Network Computing (VNC) and Remote Desktop (RDP) on supported systems from the Web-based console.*

Easier Director Agent deployment and configuration

- *Enhanced setup, deployment and update process for Director Agent.*
- *Status and setup capabilities for missing device drivers required by Director Agent.*

New Director Agent features

- *Director Agent is now cross-compatible with certain Tivoli® products, such as Tivoli Provisioning Manager.*
- *Shared, single incoming port (firewall friendly).*
- *Common authentication and credential management.*
- *Availability using watchdog restart service.*
- *Subagent add/remove/update/start/stop remote capabilities.*
- *Seamless integration of Platform Agent capabilities.*

Enhanced and increased Director command-line coverage for scripting operations to management server

- *New commands are available for system discovery, inventory, status, scheduler, user administration, automation, process management and resource monitoring.*
- *Consistent commands that work on multiple platforms.*

Improved depth and breadth of inventory and health monitoring for Power, System z, System x, BladeCenter and Storage resources.

4.0 Base Features Included with Systems Director

Systems Director is designed to facilitate the best possible utilization of both storage-based and server-based physical and virtual resources throughout the infrastructure. In order to accomplish this task, the solution combines three main components: a single web-based console, a central management server and agents (either common or platform-based).

This design yields a continuous look and feel across various common tasks, simplifying management and enhancing cross-domain consistency, while also supporting advanced and extensible features.

4.1 Integrated and Easy to Use Web-based User Interface

Web-based console

The Systems Director console builds upon industry-standard technologies (AJAX, Web 2.0, JSR 168 portlets) and leverages existing components to provide a powerful and extensible Web-based console.

Because it's Web-based, the console is exceptionally easy to administer and can be accessed from any supported browser. It allows you to carry out many essential platform tasks spanning a broad range of resources.

This centralization of resources—a core business win for Systems Director—drives business value by simplifying and consolidating different classes of information and tools used to optimize your virtualized infrastructure.

Key enhancements

The flexible and intuitive Web-based interface helps you to carry out tasks such as:

- *Setup and deployment.*
- *Searching for necessary tasks and resources.*
- *Dynamically tracking system status.*
- *Visually mapping the relationships between resources.*
- *Creating a health summary prioritized for your business needs.*

Welcome page overview

The extensible and easy-to-use welcome page provides a central location for the initial setup and ongoing usage of available plug-ins via three key tabs: *Start, Manage* and *Learn*.

- *The **Start** tab guides you through discovering deployed operating systems, requesting access to them and collecting inventory from them—all in one action.*
- *The **Manage** tab provides the list of plug-ins installed with Systems Director. You can think of it as your main activity list to manage your resources.*
- *The **Learn** tab provides a rich set of tutorials to help you master major aspects of Systems Director.*
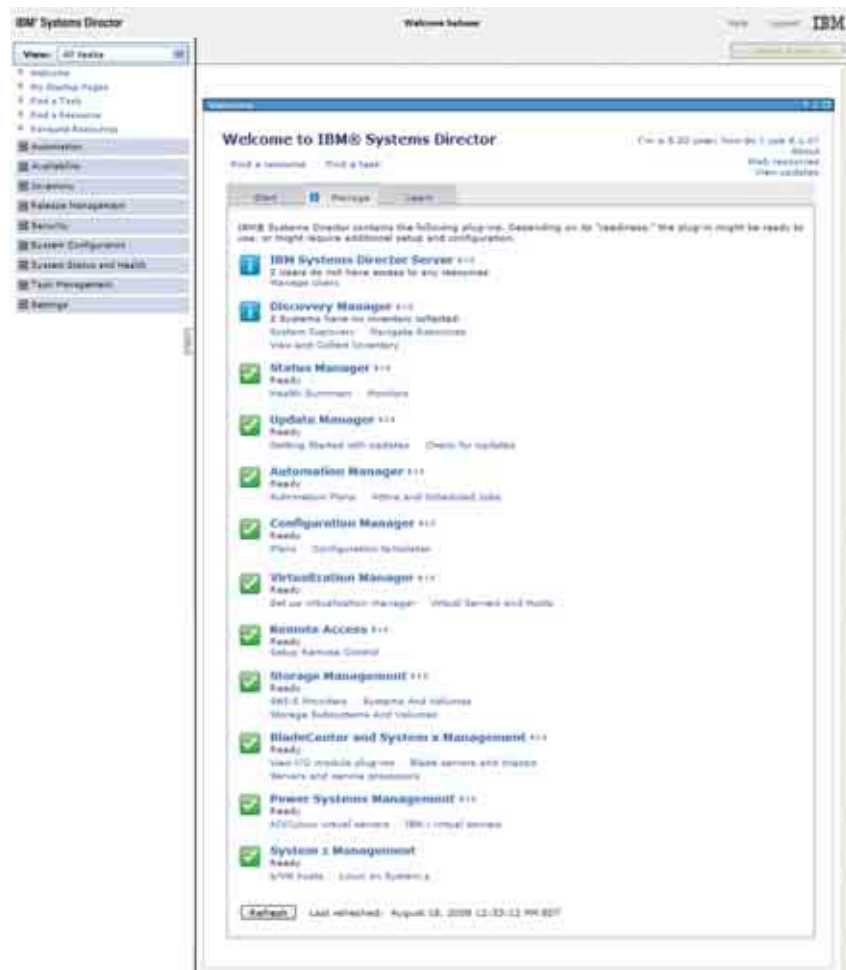
Search for a task to run

We've found that administrators commonly need to work in two different ways: task-based ways and resource-based ways. Systems Director supports both.

With Systems Director, task-based administration is easier than ever. You can select a main activity from the Manage tab, browse the navigation area on the left or simply select *Find a Task* to search for one. Once you locate the task you want, just click on it. Tasks like *Event Log* will open a new tab displaying their list of events. Tasks that can be scheduled, and tasks that require a system to be specified before execution will open the Run Dialog.
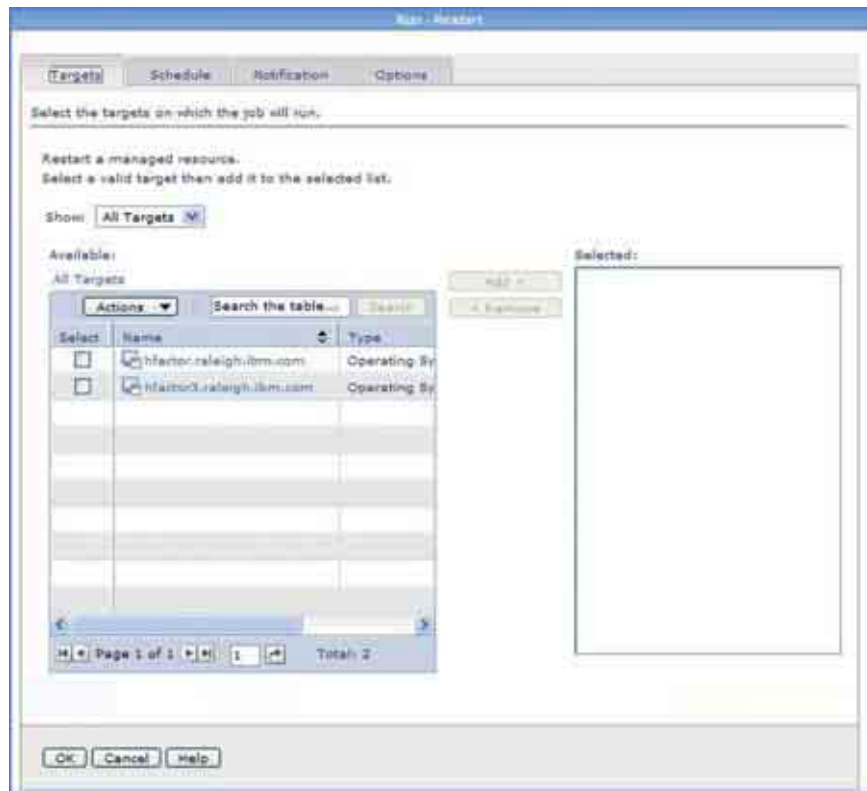
Simply find and navigate to resources you want to manage

Similarly, you can work with resources in different ways. *Find a Resource* will let you search for *any* resource that Systems Director has discovered, and will show you the list of matching resources. Once you find the system you want to manage, select it, and its properties will appear.

The *Navigate Resources* task, available in the left navigation area, is the core of resource-based management. Resources appear in groups; furthermore, these groups can be nested into user-created subgroups based on any logical relationship you see fit.

The *Health Summary* task includes a table of systems divided into customizable columns that display exactly the data you want. The default columns include *Access*, *Problem* and *Compliance Status*. The table also has a search box that can be used to filter displayed information based on search matches from any column. For example, entering a portion of a system name, IP address, MAC address or even a custom tag in the description field will display only matching systems.

Quick access to System Properties

The *System Properties* function has been completely redesigned to provide quick access to the main troubleshooting views: *General Properties*, *Active Status*, *Applied Activities*, *Event Log* and *Inventory*.

Each of these tabs will help you to isolate problems within your system. The top of *System Properties* shows the *Actions* dropdown, listing all of the tasks available to fix the problem.

End-to-end visualization of systems and related resources using Topology Map

For easy visualization of the resources associated with any given system, use *Topology Map*, which supports a variety of topology perspectives useful in different contexts. For example, if you select a virtual server, the *Virtualization Common* perspective will show you the physical system in which it's running, the virtual LAN and storage it's using and other details.

Want a list of all related resources? Try the *Related Resources* context menu for a comprehensive list.

4.2 Central Point of Control with Systems Director's Management Server

What is Systems Director's management server?

Fundamentally, Systems Director helps you to consolidate and simplify the management of resources that make up your virtualized infrastructure. It achieves this by discovering supported systems, then serving as the central point of control for managing them in an optimized way.

How, specifically, does this work? The management server includes core services based on grouping, tasking, scheduling, discovery, inventory, database, status, event, automation, security, auditing, etc. Together, these services can be used to build heterogeneous platform management tasks.

Some services even unify common operations across different platform types. This is possible because Systems Director leverages industry standards to maximize the supported platforms and resources.

Reduce deployment time

Getting the best business value from a complex virtual infrastructure requires management tools that are quick and easy to install and use.

Fortunately, we've significantly reduced the time required to install Systems Director, to configure it and to begin managing discovered systems. The management server installation process has been streamlined in terms of both its base and custom options, and the installation process and initial startup of the management server is now accelerated. Furthermore, it does not require a reboot of the server.

Once the management server is started, the Web-based console can be launched from a separate system. You can immediately get started with the *Welcome Page* to complete system discovery, deploy agents and configure custom policies and settings.

Integrated database support

As in previous releases, the management server includes an out-of-box database, Apache Derby, which is useful for managing small management environments. You can also select and configure other supported databases, such as DB2®, Microsoft SQL Server and Oracle.

Availability

Availability for a single management server is included via a "watchdog" feature to externally monitor the management server process and automatically restart it in the event that it is no longer active.

Integrated Systems Director product updates

How can you be sure that your version of Systems Director is up to date?

Systems Director includes Update Manager, which will automatically retrieve information from IBM about available updates, plug-ins and agents. Each system will be identified through notification and status indicators to show where updates are needed. The recommendations provide easy installation of the updates, and include information about new capabilities or hardware to be added.

Command line interface

Systems Director is easier to use than ever, partly because it supports different ways to carry out management tasks, thus maximizing user convenience. For instance, there are two completely different interfaces that can be used to control it.

In addition to the new Web-based console, a command line interface (CLI) is also available for administrators who prefer such an environment. This interface follows GN/POSIX conventions, including extended capabilities that allow for scripting and automation without using a console. It can be used either as an efficient way to accomplish simple tasks directly, or as a scriptable framework for automating functions not easily accomplished from a graphical user interface. For security reasons, the CLI runs only on the management server.

4.3 Security Features

Making sure that deployed solutions solve problems—rather than create them—means making sure that only the right people have access to them. For this reason, we've taken steps to help lock down access to and control of Systems Director.

Authenticating to Systems Director

The authentication process uses the configured user registry, available from the operating system, Lightweight Directory Access Protocol (LDAP) or domain controller.

Authorizing users to Systems Director

Systems Director now supports role-based access control (RBAC) for controlling access to resources, groups, tasks and command lines. In addition to basic functionality, Systems Director now gives administrators the power to determine whether an authenticated user or group has the privileges required to access specific tasks on one or more systems.

These features improve solution security by allowing you to:

- *Define access via included roles.*
- *View and manage authorized users and groups.*
- *Manually assign roles and resources to users.*
- *Manage user properties.*
- *Create and modify roles.*
- *Manage permissions that are grouped within a role.*
- *Use roles to control access to a system.*

Managing credentials in Systems Director

Systems Director now supports single sign-on (SSO) authentication for improved user convenience—that is, only one sign-on is required, even when services span different systems.

It accomplishes this by creating credentials that include a user ID and password (for a user to obtain access to shared and target systems); then, it maps these credentials to each other via the included *credential transformation service* (CTS). For more information, visit: http://publib.boulder.ibm.com/infocenter/ systems/topic/director_6.1/fqm0_main.html.

4.4 Systems Director's Operating Systems Agents

Single system view

Systems Director helps to spur cross-system management consistency by representing agent information in a consistent manner. Regardless of the type of agent or protocol configured on an operating system, the user interface delivers a single system view of the operating system and its related resources, thereby consolidating system health information and also depicting common tasks, such as inventory and updates.

In version 6.1, the following agent types are supported: No Director Agent, Platform Agent and Common Agent.

Systems with Common Agent

The Director 6.1 Common Agent can optionally be used to replace the previous Level 2 Agent (though Director will continue to work with it, as well). This option will appeal to many administrators because the new agent supports a richer set of features and subagent tasks. These include:

- *Single, shared incoming port (firewall friendly) for management.*
- *Common authentication and credential management using a single agent manager.*
- *Single agent runtime shared by IBM systems and Tivoli products, such as Tivoli Provisioning Manager, reduces agent footprint, supports shared credentials and drives discovery, inventory and other common services.*
- *Increased availability using a watchdog to restart common agent, if needed.*
- *Provides a single agent management system for managing subagent tasks for status reporting and operations such as adding, removing, starting, stopping and updating subagents.*
- *Seamless integration of the Platform Agent.*

Systems with Platform Agent

The Platform Agent is well-suited to environments in which a smaller agent footprint is desired, yet one in which administrators wish to retain a broad array of features. It provides a subset of Common Agent functions used to communicate with and administer the managed system, including hardware alerts and status information.

IBM's ongoing commitment to improve interoperability through open standards, rather than through proprietary technologies, is evidenced by Platform Agent. This agent provides discovery, authentication and management entirely through industry standards, such as the Common Information Model (CIM) and Web-based Enterprise Management (WBEM) interfaces, which were developed by a consortium of major hardware and software vendors (including IBM) called the Distributed Management Task Force (DMTF). The CIM provides the framework upon 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 Systems Director, can more easily manage the device.

Systems with No Director Agent

Systems Director also provides a set of manageability functions for managed systems that lack both the Common Agent and the Platform Agent. These systems with no Director Agent are best for environments that require very small footprints and are used for specific tasks, such as one-time inventory collection, firmware and driver updates and remote deployment. Systems without a Director Agent must support the Secure Shell (SSH), Distributed Component Object Model (DCOM) protocol or SNMP in order for Systems Director to support them.

New Agent initial setup and configuration

Deploying target agents is easier than ever with Systems Director. Administrators can simply leverage a new agent release management task via the Web-based console to distribute and install the proper agent and subagent packages to suitable operating systems.

5.0 Base Manager plug-ins included with Systems Director

Systems Director's plug-in architecture has been specifically designed to drive business value, both today and tomorrow, in ways that can be tailored to suit your specific business context.

How does it work? Systems Director includes several base managers, implemented as plug-ins, that provide an integrated set of consistent tasks and features to manage discovered resources. Furthermore, additional plug-ins can be downloaded and installed for advanced functions or functions tailored to a particular environment.

5.1 Discovery Manager

What is Discovery Manager?

Discovery Manager consolidates a set of common tasks and capabilities to discover systems on the network and to perform a deep inventory of related resources. Discovery Manager has been redesigned around a consistent user interface to accomplish basic system discovery through an interactive UI, or advanced discovery through an easy-to-use wizard. You can use this plug-in to:

- *Obtain a central view of discovered systems and systems requiring access, as well as a summary of other related tasks.*
- *Discover systems such as physical and virtual servers, storage systems and network devices in a heterogeneous environment.*
- *Visualize systems and related resources via the Resource Navigator.*
- *Carry out common inventory tasks to collect and view system data like physical, logical and virtual hardware (such as virtual systems, virtual servers and farms), software applications, operating systems, middleware, firmware and BIOS, diagnostics and network information.*
- *Manage inventory profiles used to discover resources or inventory data based on a set of criteria.*
- *Pass security credentials to one or more systems in order to gain access to their agents.*
- *Consistently map different discovery protocols and data and seamlessly integrate them using a common data model.*

Simplified system discovery

The new features of Systems Director make discovering systems on the network very simple. You can now enter a single hostname, single IP address or range of IP addresses, without having to understand the platform specifics for each system. While the task is being run by the management server, the discovery task provides visual feedback on the progress of the discovery, as well as displays the resources of the systems discovered. You can also navigate to and perform other tasks pertaining to each of these systems.

Advanced system discovery

Systems Director also includes a straightforward wizard to streamline advanced discovery settings for one or more system types and related protocols. This advanced discovery wizard also allows for the creation of complete discovery tasks that include authentication to discovered resources and collection of inventory from discovered systems. Each workflow can be saved and executed, or scheduled to perform the advanced system discovery. Once workflows are executed, the console will display their status and percentage of completion.

5.2 Status Manager

What is Status Manager?

Status Manager provides details on the health of your managed systems (including hardware, operating systems, applications and security) and processes. With Systems Director, you can easily use Status Manager to visualize systems in user-determinable levels of detail as a troubleshooting technique.

The status of discovered systems is automatically retrieved and displayed, and this display can be customized in several ways—by using one of the system status and health-related tasks, by navigating to a specific resource or by using the new capabilities integrated into the command line interface.

With Status Manager you can:

- *Use the **Welcome Page** for Status Manager to view the central status of discovered systems, and to obtain a summary of tasks that will help you to manage the status, problems and events for systems.*
- *Determine the health and performance of managed resources in your environment using the **Health Summary, Scoreboard** and **Dashboard**.*
- *Use the **Health Summary** to visualize the overall health of your managed resources. The **Scoreboard** provides the number of managed resources in states such as **Critical, Warning** or **Informational**. The **Dashboard** shows performance metrics for specific managed resources.*
- *Identify problems and determine the root cause by viewing **Problems** and the **Event Log**.*

- *Subscribe to events on the problems deemed important. You can also identify events to be cleared automatically.*
- *View the **Event Log**.*
- *Monitor dynamic properties of managed resources by defining monitors and thresholds.*
- *Monitor processes and device services on a specific system by defining monitors and thresholds.*

Health Summary view

On many occasions, a quick overview of system health is needed. For this reason, Systems Director's Status Manager includes a customizable *Health Summary* task for easy insight into system status. This single view or page consolidates other status views, such as the *Scoreboard*, a health summary by favorite groups, and a dashboard resource monitor.

Together, these tools provide a single interface with which you can quickly view the status of important areas of your environment, monitor critical resources and view the contents of user-defined health summary groups.

- **Scoreboard**—*Groups discovered systems by health status (Critical, Warning or Informational).*
- **Dashboard**—*Displays a real-time, graphical representation of resource status based on the measurable properties of the resource that has been set.*
- **Health Summary Panel**—*Displays systems that you have selected to quickly view, monitor and drill down for more details.*

Systems with problems

Tracking system status is one thing. Solving discovered problems is another. Systems Director is designed to help you accomplish both.

Using the *Scoreboard*, you can identify the number of systems with problems in your data center. The ability to drill down to view the specific problems on a system is intuitively integrated into the *Health Summary* view (and throughout Systems Director). This display reflects any known problems with your hardware, as well as triggered threshold monitors, in a single status overview. When problems are critical, the status of the system is updated correspondingly.

The extensible design of Systems Director allows for new information concerning system problems to be included with other tasks, such as platform management or advanced manager plug-ins. Such information could include the LED status of System x servers, energy status via Active Energy Manager™ or service status via Service and Support Manager.

Customize Health Summary with your favorite systems

Here, too, Systems Director supports customization to help you tailor the tool to your specific needs. At any time, you can add a system or a resource to your *Favorites,* which are part of the *Health Summary* task.

5.3 Configuration Manager

What is Configuration Manager?

Among the many essential tasks involved in obtaining the best business value from a virtualized infrastructure is custom system configuration. Systems Director supports system configuration through Configuration Manager, which is used to integrate new hardware into the environment, configure systems after installation or do one-off configurations for unique requirements.

By leveraging a set of well-defined templates that can be applied to systems, Configuration Manager provides a consistent user experience for configuring server, storage and network resources, even though these resources are comprised of very different technologies.

You can use this plug-in to:

- *Obtain a central view of system configuration status and task summaries from the Welcome Page for Configuration Manager.*
- *Initially configure one or more systems (hardware and OS) for deployment, allocation and activation.*
- *Automatically configure newly discovered systems using the automatic-apply capability of a configuration plan.*
- *Reconfigure systems to prepare for redeployment, reallocation or re-provisioning (for example, as a result of an event, or as part of a workflow that the configuration needs to support).*
- *Customize settings in real-time, then save those settings as a template (or a collection of settings as a system plan).*
- *Manage configuration templates and plans. A configuration template is a collection of settings and values that define the configuration of a system. A configuration plan is a set of templates that can be applied to one or more systems in a specific order.*

5.4 Update Manager

What is Update Manager?

Keeping your systems current with the critical or latest updates for hardware and software can make all the difference in system stability. Many customers rely on a variety of tools and information sources to figure out what is needed and how to update the system. This has been simplified by consolidating the necessary views and tasks needed to maintain your system into the Update Manager plug-in.

The capabilities of this plug-in include:

- *Notify the user of systems that are out-of-date based on default or customized compliance policies.*
- *Provide simplified tasks to download and install updates without repackaging or requiring each step in the process to be performed separately.*
- *Expand support from System x and BladeCenter to include Power, System z and IBM Systems Director software.*

5.5 Remote Access Manager

What is Remote Access Manager?

Running and monitoring non-local applications or services—a basic part of managing a virtualized infrastructure—sometimes requires remote access. In Systems Director, remote access is handled by the Remote Access Manager, which supports the following:

- *Viewing and interacting with systems remotely by displaying the screen image of the system. You can also launch other remote control tools, including VNC and web-based remote control for IBM BladeCenter and RSA.*
- *Running command line programs through a remote session. The remote session creates less network traffic and uses fewer system resources than the Remote Access Control task and is therefore useful in low-bandwidth situations.*
- *Sending files from one location to another and synchronizing files, directories or drives via a secure alternative to FTP.*

5.6 Automation Manager

What is Automation Manager?

Automation is a key enabler of business value in IT today, empowering organizations by driving common tasks and processes with exceptional speed and accuracy, thus freeing resources for more complex tasks of higher business priority. Further, in a modern virtualized infrastructure, automation can play a powerful role in ensuring that you get the highest utilization from your many assets.

Systems Director supports automation through the Automation Manager plug-in, which is used for the following:

- *Creating event-automation plans used to automate tasks and other responses to situations that occur in your environment.*
- *Creating and managing event filters that allow the event automation plans to target specific events.*

- *Creating and managing event actions that identify tasks or commands to run and notifications to send.*
- *Scheduling of one-time or recurring tasks.*
- *Creating and managing command definitions that allow remote commands to be run using specific user IDs on target systems.*

5.7 Virtualization Manager

What is Virtualization Manager?

Basic support for common lifecycle management tasks used throughout the virtual infrastructure is significantly simplified and enhanced with Systems Director. This support comes by way of the Virtualization Manager (VM) plug-in, which, together with other Systems Director plug-ins, provides a consistent user experience for common tasks such as discovery; inventory; health status; startup/shutdown; and system creation, deletion and editing, as well as system relocation across different physical hosts.

Virtualization Manager now includes support for virtualized environments managed by wholly different server virtualization environments. These include Hardware Management Console (HMC), Integrated Virtualization Manager (IVM), Microsoft Virtual Server, VMware and Xen virtualization. Some additional basic discovery and health management is supported for z/VM® virtualization. As a result of this cross-solution management consolidation, you can visualize and control both the physical and virtual resources from a single user interface.

Features and benefits include:

- *Consolidated management for different virtualized environments and tools, including Hardware Management Console (HMC), Integrated Virtualization Manager (IVM), Microsoft Virtual Server, VMware and Xen virtualization.*
- *A topology viewer to relate the connection between physical and virtual resources, which can vary dynamically across time. Two examples include:*
    — *A BladeCenter chassis with VMware installed on a blade that is hosting two virtual servers running Linux operating systems with Systems Director's Common Agent.*
    — *An HMC environment with the Power server hosting a virtual server running AIX operating system with Systems Director's Common Agent.*
- *Tracking of alerts and system status for virtual resources to help isolate problems that affect them.*
- *Creation of automation plans based on events and actions from virtual and physical resources, such as relocating a virtual server based on critical hardware alerts.*
- *Lifecycle management tasks, such as creating additional virtual servers, editing virtual server resources or relocating virtual servers to alternate physical hosts.*

5.8 Platform Management Plug-ins Included with Systems Director

The Platform Management plug-ins extend the Systems Director foundation to provide support for the entire service lifecycle of systems throughout your virtualized infrastructure. New information garnered via plug-ins is automatically passed on to the overall solution, helping administrators to stay on top of changes as they occur in a manner that corresponds with overall business goals.

Features of the Platform Management plug-ins include:

- *Welcome Page—Get quick insight into the status and performance of the virtualized infrastructure.*
- *Discovery and inventory—Find and track deployed assets and resources.*
- *Health status and events—Evaluate system health.*
- *Configuration and updates—Ensure that the infrastructure is up-to-date, secure and compliant.*
- *Platform groups—Perform tasks on platform-based subsets of the infrastructure via remote system consoles.*

5.9 IBM BladeCenter and System x Management

This plug-in allows Systems Director to support certain features targeting IBM's modular System x and IBM BladeCenter systems and related resources, including discovery, health and status monitoring, configuration, updates and virtualization. It also provides a *Welcome Page* summary view and platform-specific functions such as the following:

- *Changing power settings.*
- *Managing hardware logs.*
- *Identifying hardware using the locator LED.*
- *Turning off light-path diagnostic LEDs.*

5.10 IBM System z Management

For organizations with IBM System z mainframes, Systems Director delivers added management value by empowering administrators to integrate and manage System z-hosted Linux servers and z/VM systems in a consistent, interoperable manner. Ability to discover hardware management consoles for System z and System z physical servers is also delivered.

This plug-in provides functions to discover, monitor the status of, configure and update these virtual servers. It also generates information used in the Welcome Page summary view and includes support for Linux on System z, z/VM systems running on IBM System z mainframes (formerly zSeries servers), hardware management consoles and System z physical servers.

5.11 IBM Power Systems Management

The exceptional value proposition of Systems Director extends to IBM Power Systems as well. Here, the tool provides lifecycle management of both the underlying hardware and platform managers, such as Hardware Management Console (HMC) and Integrated Virtualization Manager (IVM) platform managers, via features including discovery, health and status monitoring, configuration, updates and virtualization. It also provides a *Welcome Page* summary view and platform-specific functions.

You can use the IBM Power Systems Management plug-in to:

- *Manage the following Power System environments that might include POWER5™ and POWER6™ processor-based servers running AIX, IBM i or Linux:*
  - *Power Systems managed by the Hardware Management Console.*
  - *Power Systems managed by the Integrated Virtualization Manager.*
  - *A Power Systems server with a single image.*
  - *A Power Architecture® BladeCenter server under the control of a BladeCenter management module.*
- *Perform management tasks on systems that are under the control of the Hardware Management Console and Integrated Virtualization Manager, including managing power, creating virtual serves, editing virtual server resources and relocating virtual servers between host systems.*
- *Perform operating system specific management tasks that are available from the Systems Director Console for AIX and IBM i.*

5.12 Storage Management

A key strength of Systems Director is the power it gives IT managers to manage not only virtual servers but also virtual storage—a fundamentally different class of technology that must nevertheless be integrated with virtual server management for best business results. By transforming *both* processing power and storage into fluid resources that can be dynamically allocated to business services in a prioritized manner, IT can help organizations to achieve business goals more efficiently and cost effectively.

Systems Director's Storage Management plug-in helps to fulfill this exciting possibility via lifecycle management of storage systems, including discovery, health and status monitoring, configuration, updates and virtualization. It also provides a *Welcome Page* summary view and platform-specific functions. Some of its capabilities include:

* *Seamless integration of the Storage Configuration Manager (SCM) features for managing integrated RAID Controllers, BladeCenter's SAS Module and BC-S RAID SAS Module.*
* *Integration of embedded management interfaces for DS3000, DS4000 and DS6000, as well as TotalStorage Productivity Center Limited Edition and TotalStorage Productivity Center Basic Edition to provide management of SVC, DS8000™ and ESS storage devices.*
* *Simplified discovery and management scenarios for storage systems that require the SIM-S proxy agent (SNIA Storage Management Interface Specification) to be managed.*
* *Standards-based storage implementations to reduce confusion, ease vendor adoption and broaden the storage systems supported by Systems Director.*
* *Automation plans based on events and actions from storage resources.*
* *Support for IBM System Storage Area Network products.*

6.0 Extend Systems Director with Additional Plug-ins

What if your organization requires features that are not available from the standard array of plug-ins? Fortunately, Systems Director allows you to extend the base platform with additional plug-ins, separately installed. By following design guidelines, a plug-in of this type can deliver key new functionalities while retaining a consistent user experience with the base offering by taking advantage of the common tasks and capabilities.

IBM intends to support the following plug-ins with IBM Systems Director 6.1:

Service and Support Manager

The Service and Support Manager plug-in identifies and reports hardware-related problems. These problems are integrated into Status Manager to extend the system health status via a new service category. The automated Electronic Service Agent capabilities are used to gather service information and report problems to IBM. Service information may include contact, location, inventory or other available logs.

IBM Systems Director Active Energy Manager (AEM)

Active Energy Manager measures, monitors and manages the energy components built into IBM systems, enabling a cross-platform management solution. Active Energy Manager extends the scope of energy management to include facility providers, thus enabling a more complete view of energy consumption within the data center.

BladeCenter Open Fabric Manager (BOFM)

BladeCenter Open Fabric Manager allows for the assignment and reassignment of Ethernet MAC and Fibre Channel WWN addresses used by the I/O ports on server blades in the BladeCenter. This is accomplished via a combination of firmware installed in the BladeCenter Advanced Management Module, BIOS firmware installed in the blades and firmware installed in the I/O cards. BOFM also provides the capability to detect failures on a blade and move the addresses from the failed blade to a spare blade.

Tivoli Provisioning Manager for OS Deployment (TPMfOSD)

IBM's TPMfOSD is a best-in-class tool designed to provision an operating system through a library of disk images to supported systems on the network. Along with Systems Director, this tool dramatically simplifies the server configuration and operating system installation, BIOS updates and disposal of retired systems for both IBM and non-IBM systems.

Virtual Image Management

Virtual Image Manager provides a single, unified view of all system templates and server images to help customers manage and deploy their systems. It allows customers to easily deploy new physical and virtual servers based on system templates and images. The templates can be used to create, customize and clone virtual and physical images on x86, AMD and POWER-based systems.

For a complete list of Systems Director plug-ins, their availability, and platforms supported, visit the Systems Director Website at **ibm.com**/systems/management/director/.

All statements regarding IBM's plans, directions and intent are subject to change or withdrawal without notice.

7.0 Summary

Systems Director delivers powerful, centralized management of a complex, virtualized infrastructure—including basic, everyday tasks and many advanced tasks as well.

With Systems Director, the underlying technical differences across different hardware and software virtual solutions are abstracted out, allowing you to manage the overall virtualized infrastructure as a unified whole and align it more closely with changing business goals and strategies. Furthermore, through its next-generation feature set—extensible via a plug-in architecture—Systems Director can help you to accomplish *more* through virtualization than ever before.

In this way, Systems Director not only simplifies management, it optimizes it. With Systems Director, you can more easily and efficiently isolate and troubleshoot problems, deploy new services, visualize assets and resources and obtain a higher return on infrastructure investment—in short, achieve the full potential of virtualization.

8.0 Appendix: Systems Director Topology

IBM® SYSTEMS DIRECTOR PRODUCT TOPOLOGY

NEW ENTERPRISE DATA CENTER

USER INTERFACE
- Single Web-based interface (Internet Explorer and Firefox)
- Command line interface

ENTERPRISE SYSTEMS MANAGEMENT
- Tivoli Enterprise
- Tivoli NetView
- CA Unicenter
- HP OpenView
- Microsoft Systems Management Server
- Microsoft Operations Manager 2005
- And others

MANAGEMENT SERVER
- Central point of control
- Includes console, server and agent components
- Supported on Windows, AIX and Linux Operating Systems

IBM SYSTEMS DIRECTOR MANAGEMENT SERVER

COMMON SYSTEM MANAGER PLUG-INS
Discovery | Status | Updates | Automation | Configuration | Remote Access | Virtualization

PLATFORM MANAGEMENT PLUG-INS
Power Systems | BladeCenter | System x | System z | Storage Systems

SYSTEMS DIRECTOR PLATFORM MANAGEMENT FOUNDATION SERVICES

ADDITIONAL PLUG-INS: AEM, BOFM, TPMfOSD, and others

MANAGED SYSTEMS

OPERATING SYSTEMS WITH SUPPORTED AGENTS
No Systems Director Agent (SNMP,SSH,DCOM) | Systems Director Platform (CIM Based) Agent | Director Agent 5.x | Systems Director Common (w/Tivoli) Agent 6.1 | IBM i | Windows | Linux | AIX

VIRTUAL RESOURCES
PowerVM | VMware | Xen | Microsoft Virtual Server | z/VM | IBM TotalStorage SAN Volume Controller

PHYSICAL RESOURCES
Servers, Storage and Networks

9.0 Appendix: Overview of Task Mapping from 5.x to 6.x

5.20.x Features	6.1 Plug-in	Systems Director Web Console Feature
Managed Object Discovery	Discovery Manager	Base System Discovery and Advanced System Discovery
Inventory Collection	Discovery Manager	View and Collect Inventory
Inventory Tasks	Discovery Manager	View and Collect Inventory
Inventory Monitors	Not Supported	Not Applicable
Groups, All Managed Objects	Discovery Manager	Navigate Resources > All Systems
Hardware Status	Status Manager	Integrated with Health Summary View Scoreboard Problems, Active Status
Event Log	Status Manager	Event Log
Resource Monitoring	Status Manager	Health Summary View, Dashboard, Monitors and Threshold UI with increased metrics
Monitor Threshold Plans	Status Manager	Groups with Thresholds
Process Tasks	Status Manager	Command Automation, Command Definitions
Process Manager	Status Manager	Manage Processes (from Monitors task), Health Summary, Dashboard Monitors and Threshold UI
Event Log Viewer	Status Manager	Event Log UI with enhanced sorting
SNMP Browser/Manage MIBs	Status Manager	SNMP Management
File Transfer	Remote Access Manager	Integrated into Remote Access
Windows Remote Control	Remote Access Manager	Integrated with Remote Access > Remote Control Remote Control Setup for VNC (Windows, Linux) and MS Remote Desktop (Windows)

5.20.x Features	6.1 Plug-in	Systems Director Web Console Feature
Remote Session	Remote Access Manager	Integrated into Remote Access
System Account Configuration	Configuration Manager	Configuration Templates
SNMP Agent Configuration	Configuration Manager	Configuration Templates
Asset ID Configuration	Configuration Manager	Configuration Templates
BladeCenter Configuration Manager	Configuration Manager	Configuration Templates
Server Configuration Manager	Configuration Manager	Configuration Templates
OS Network Configuration	Configuration Manager	Configuration Templates
Event Action Plans	Automation Manager	Automation Plans Wizard, Event Actions, Event Filters UI Removed: ticker tape, event message actions
Scheduler	Automation Manager	Active and Scheduled Jobs
Update Manager	Update Manager	Includes product and additional platform updates Getting started, settings Install, Uninstall, Import, Export Updates Show needed and installed updates Change Compliance policies
Virtualization System Manager (VSM)	Virtualization Manager	Create Virtual Server, Virtual Servers and Hosts, Platform Managers and Members, Edit Virtual Resources, Topology Perspectives, Relocate Virtual Server
Relocation Manager	Virtualization Manager	Virtual Farms Create and manage Farms Relocation Plans

5.20.x Features	6.1 Plug-in	Systems Director Web Console Feature
Standalone Storage Configuration Manager	Storage Manager	View and Manage Logical Volumes View and Apply Storage Templates
CIM Browser task	Not supported	Not applicable
MSCS Browser task and no discovery	Not supported	Not applicable
Rack Manager	Not supported	Not applicable
License Administrator task	Not supported	Not applicable
Software Distribution Redirector	Not supported	Not applicable
Edit Software Catalog	Supported via command line	Supported via command line
Capacity Manager extension	Tivoli based offering planned for 2009	Not applicable
System Availability Extension	Not supported	Not applicable
Software Distribution Extension	Tivoli based offering planned for 2009	Not applicable
ServeRAID™ Manager extension	Not supported	TIP: You can launch the ServeRAID Manager as an external application from the Systems Director Web interface; however, the application does not recognize Systems Director systems, groups or clusters.
z/VM Center extension	Discovery Manager Status Manager Virtual Manager for Lifecycle management of virtual server and Virtual Image Manager planned for 2009	Discovery and Health integrated into base offering of Systems Director

10.0 Quick Specs

Systems Director's management server and agents have recommended hardware/software requirements. For more information, see IBM Systems Information Center for IBM Systems Director v6.1 on IBM's Website.

10.1 Hardware Requirements

For the latest information about hardware requirements, see the IBM Systems Director 6.1 information center at:

http://publib.boulder.ibm.com/infocenter/systems/topic/director.plan_6.1/fqm0_r_hardware_requirements.html

This Web link will not be available until the product's general availability.

10.2 Operating Systems Supported by Systems Director

IBM Systems Director 6.1.0 provides support for many operating systems.

For the latest information about operating system requirements, see the IBM Systems Director 6.1 information center at:

http://publib.boulder.ibm.com/infocenter/systems/topic/director.plan_6.1/fqm0_r_operating_system_and_software_requirements.html

This Web link will not be available until the product's general availability.

10.3 Virtualization Software Supported by Systems Director

Systems Director supports virtualization software versions for each virtualization environment.

Hardware Management Console (HMC)
- *Hardware Management Console Version 7.3.1 SP1, 7.3.2, 7.3.3, and 7.3.4*

Integrated Virtualization Manager (IVM)
- *Integrated Virtualization Manager Version 1.5.1.1, 1.5.2, and 2.1*

Microsoft Virtual Server
- *Microsoft Virtual Server 2005 R2 SP1*

Note: Supported guest operating systems are those that are supported by both Systems Director and the specified version of the Microsoft offering. See the Microsoft product documentation for a list of supported operating systems.

VMware ESX Server

- *VMware ESX Server 2.5.x Service Console*
- *VMware ESX Server 3.0.x Service Console*
- *VMware ESX Server 3.5.x Service Console*

VMware Server (under the control of VMware VirtualCenter, running on Windows only)

- *VMware Server 1.0*
- *VMware Server 2.0*

VMware VirtualCenter

- *VMware VirtualCenter V1.4.x*
- *VMware VirtualCenter V2.0.x*
- *VMware VirtualCenter V2.5.x*

Notes:

- *VMware VirtualCenter must be installed on a physical system to operate in the virtualization manager environment.*
- *If you use VMware VirtualCenter 1.4.1, make sure that you download and install the latest patches from Download VMware VirtualCenter 1.x,* http://www.VMware.com/download/vc/, *before you install Virtualization Manager.*

Xen virtualization

- *Red Hat Enterprise Linux 5.0, with Xen 3.0.3*
- *Red Hat Enterprise Linux 5.1, with Xen 3.1*
- *Red Hat Enterprise Linux 5.2, with Xen 3.1.2*
- *SUSE Linux Enterprise Server 10, with the Xen Virtual Machine Host Server option installed (XEN 3.0)*
- *SUSE Linux Enterprise Server 10 SP1, with the Xen Virtual Machine Host Server option installed (XEN 3.0.4)*
- *SUSE Linux Enterprise Server 10 SP2, with the Xen Virtual Machine Host Server option installed (XEN 3.2)*

10.4 IBM BladeCenter Products

Systems Director provides support for BladeCenter chassis and blade servers.

- *BladeCenter chassis, machine type 8677*
- *BladeCenter H chassis, machine type 8852*
- *BladeCenter T chassis, machine type 8720*
- *BladeCenter T chassis, machine type 8730*
- *BladeCenter S chassis, machine type 8886*
- *BladeCenter HT chassis, machine type 8740/8750*
- *BladeCenter HC10 chassis, machine type 7996*
- *BladeCenter JS12 Express, machine type 7998-60X*
- *BladeCenter JS20, machine type 8842*
- *BladeCenter JS22, machine type 7998*
- *BladeCenter HS12, machine type 8014, 8028*
- *HS20 blade server, machine type 7981*
- *HS20 blade server, machine type 8832*
- *HS20 blade server, machine type 8843*
- *HS21 blade server, machine type 7995*
- *HS21 blade server, machine type 8853*
- *HS40 blade server, machine type 8839*
- *JS21 blade server, machine type 8844*
- *LS20 blade server, machine type 8850*
- *LS21 blade server, machine type 7971*
- *LS41 blade server, machine type 7972*
- *QS21 blade server*
- *QS22 blade server*

10.5 IBM Systems Director storage devices

Systems Director Server provides support for a range of storage devices.

For the latest information about supported storage devices, see the IBM Systems Director 6.1 information center at:

http://www.publib.boulder.ibm.com/infocenter/systems/topic/director.plan_6.1/
fqm0_r_hardware_compatibility_storage_devices.html

This web link will not be available until the product's general availability.

10.6 Required SMI-S providers

Systems Director requires SMI-S 1.1 providers on the storage devices.

For the latest information SMI-S 1.1 providers, see the IBM Systems Director 6.1 information center at:

http://www.infocenterdev2.raleigh.ibm.com:8090/help/topic/director.storage_6.1/
fqm0_t_sm_managing_smis_providers.html

This web link will not be available until the product's general availability.