



IBM Storage Server

The IBM® storage server combines IBM hardware technology with the Microsoft® Storage Server 2003 R2 product to create an affordable and optimized network-attached file server solution to meet your file storage needs. Additional software is also provided to create a comprehensive IBM storage server product.

The hardware, operating system, and most applications are preinstalled and preconfigured for rapid installation and deployment. The following software products and services are also included with the IBM storage server:

- IBM Director
- IBM ServeRAID™ Manager
- IBM Tivoli Continuous Data Protection for Files
- Print management

ServeRAID Manager and IBM Director are not preinstalled; however, the files are on the hard disk. See “Additional products and services” on page 7 for more information.

This document provides the following information:

- “Installing the IBM storage server”
- “Using the IBM storage server” on page 3
- “Additional products and services” on page 7
- “Recovering the IBM storage server” on page 8

Installing the IBM storage server

This section provides information about installing and configuring the IBM storage server for the first time. To recover the system if you have a problem that cannot be solved by any other means, see “Recovering the IBM storage server” on page 8.

You can access the IBM storage server interface from either a *remote console* or a *local console*. A *remote console* is a system that is not directly attached to the IBM storage server, and it uses a network connection with the Dynamic Host Configuration Protocol (DHCP) or an assigned static IP address to communicate with the IBM storage server. A *local console* consists of a monitor, keyboard, and mouse that are attached directly to the IBM storage server.

A remote console is the default method for accessing the IBM storage server interface.

The remote console system must meet the following requirements:

- It must be running a Windows® operating system.
- It must have Microsoft Terminal Services Client (mstsc.exe) installed.
- It must be connected to the network that the IBM storage server is connected to.

Use one of the following procedures to install the IBM storage server.

Installing the IBM storage server with a remote console

To install the IBM storage server, complete the following steps:

1. Note the serial number of the server. See the *IBM Installation Guide* that comes with the server for the location of the serial number.
2. Unpack and install the server. See the *IBM Installation Guide* that comes with the server for installation information.
3. Connect the server to your network or networks.
4. Press the power-control button. Wait 10 to 15 minutes for the IBM storage server installation process to be completed.
Attention: Unexpected results can occur if you turn off the server, press a key, or use the mouse during the initial startup of the server.
5. On the remote system, click **Start** and then click **Run**. The “Run” window opens.
6. Type `mstsc` and click **OK**. The Remote Desktop Connection window opens.
7. In Computer, type the system name or IP Address of the IBM storage server and then click **Connect**.

Note: The default system name is `IBMxxxxxxx`. The value `xxxxxxx` is the serial number of the server. See the *IBM Installation Guide* that comes with the server for the location of the serial number.

8. Type the user name and password. The default user name is `administrator`, and the default password is `passw0rd`. The 0 in the default password is a zero. The IBM storage server desktop is displayed.

Go to “Using the IBM storage server” on page 3 for information about using the IBM storage server.

Installing the IBM storage server with a local console

To install the IBM storage server, complete the following steps:

1. Gather the following information.

Information	Record information	Default value	Comments
System name		<code>IBMxxxxxxx</code>	The value <code>xxxxxxx</code> is the serial number of the server. See the <i>IBM Installation Guide</i> that comes with the server for the location of the serial number.
System password		<code>passw0rd</code>	The 0 in the default password is a zero.
Network address		DHCP	
DNS server IP address		Not applicable	If more than one DNS server is used, record the information for each server.
Network interface card (NIC) port	<ul style="list-style-type: none"> • IP address • Subnet mask • Gateway address 	Not applicable	If more than one NIC is used, record the information for each NIC.

2. Unpack and install the server. See the *IBM Installation Guide* that comes with the server for installation information.
3. Connect a monitor, keyboard, and mouse to the server.
4. Connect the server to your network or networks.
5. Press the power-control button. Wait 10 to 15 minutes for the IBM storage server installation process to be completed. The “Welcome to Windows” window opens.
Attention: Unexpected results can occur if you turn off the server, press a key, or use the mouse during the initial startup of the server.
6. Press `Ctrl+Alt+Delete`. The “Log on to Windows” window opens.

7. Type the user name and password. The default user name is administrator, and the default password is passw0rd. The 0 in the default password is a zero.
8. Click **OK**. The IBM storage server desktop is displayed.

Go to “Using the IBM storage server” for information about using the IBM storage server.

Using the IBM storage server

Use the IBM storage server interface for all IBM storage server tasks. This section provides information about the following tasks that you must complete to use the IBM storage server:

1. Start the IBM storage server interface (management console).
2. Create data partitions if you are using the IBM storage server for the first time.
3. Learn about the administration tasks that you can perform using the IBM storage server.

Management console

The Windows Storage Server Management Console opens in the Microsoft Management Console (MMC), providing an easy and convenient means for administration. The Management Console opens automatically once you are logged into Windows Storage Server 2003 R2, but if the console does not automatically open, or if it is closed, you can reopen the management console.

To open the Windows Storage Server Management Console:

1. Click **Start**.
2. Select **All Programs**.
3. Select **Administrative tools**.
4. Click **Windows Storage Server Management**, and the Management Console will open.
5. Once inside the Management Console, the **File Server Management (Local)** node in the left hand navigation tree will take the default focus. The center pane will provide various common scenarios to choose from to better assist in the administration of Windows Storage Server 2003 R2.

Single instance storage

The single instance storage (SIS) feature dramatically reduces the storage capacity that is utilized for duplicate copies of identical files. Once it has been implemented, SIS functionality runs as a background service that consolidates redundant file data into a single common store. Duplicate files are replaced with links that appear to end users and to applications to be the same as the original files. SIS functionality is a proven technology that has been deployed in large enterprise environments to significantly reduce the amount of storage capacity that is consumed by duplicate files. By reducing the storage capacity that is required for duplicate file data, customers can maximize their existing storage resources.

Single Instance Storage (SIS) recovers disk space by reducing the amount of redundant data stored on a server, by identifying identical files, storing a single copy of the file in a central repository and replacing the files with pointers to the file in the SIS common store. SIS works automatically without any end-user involvement. The administrator can enable SIS on a per volume basis.

Administration of single instance storage: Single Instance Storage (SIS) can be managed only through the command line tool, Sisadmin.exe. The following table lists the Sisadmin.exe command line parameters.

Table 1.

(none)	Lists volumes on which SIS is installed
/i [vol]	Installs SIS on volumes (creates common store, activates filter and groveler).
/f [vol]	Puts the groveler into foreground mode.

Table 1. (continued)

(none)	Lists volumes on which SIS is installed
/b [vol]	Puts the groveler into background mode.
/e	Enables the groveler on all volumes.
/d	Disables the groveler on all volumes.
/v [vol]	Displays statistics about SIS usage on volumes (including disk space saved).
/l [vol]	Lists SIS-controlled volumes.
/s [vol]	Displays information about the SIS files.
/h or /?	Displays help text.

Creating data partitions

This section provides overview information about creating data partitions. You must configure the data partitions to meet the needs of your enterprise. For more information about data partitions, click **Help** from the IBM storage server desktop.

Use the following procedure as an example of how to create a data partition.

Note: This procedure is an example and does not provide specific configuration values. For each window that can be used to specify configuration values, you can either accept the default values or specify different values.

1. Click **Start** → **Programs** → **Administration Tools** → **Computer Management** → **Disk Management**. The “Disk Management” window opens.
2. Click in the unallocated disk space for Disk 1. Diagonal lines are displayed in the selected area.
Attention: Do not select Disk 0: (IBM_PRELOAD (C:)). Disk 0 is reserved for use only by the IBM storage server operating system.
3. Right-click the selected disk space and click **New Partition**. The New Partition wizard opens.
4. Click **Next** and select **Extended partition**.
5. The “Specify Partition Size” window opens.
6. Click **Next**. The “Completing the New Partition” window opens.
7. Click **Finish**. The Unallocated area is highlighted and is now named “Free space.”
8. Right-click the Free space area and select **New Logical Drive**. The New Partition Wizard opens.
9. Click **Next**. The “Select Partition Type” window opens.
10. Select **Logical drive** and click **Next**. The “Specify Partition Size” window opens.
11. Click **Next**. The “Assign Drive Letter or Path” window opens.
12. Click **Next**. The “Format Partition” window opens.
13. Click **Next**. The “Completing the New Partition Wizard” window opens.
14. Click **Finish**.
15. The “Disk Management” window opens and the formatting process starts. The percentage of formatting that is complete is displayed. The partition is ready for use when the formatting process is completed.

IBM storage server administration tasks

The IBM storage server administration tasks are organized by components. For more information about the component tasks, click **Help** from the IBM storage server desktop.

Note: The administration tasks that are available depend on the server model that your IBM storage server is installed on.

Microsoft Services for Network File System

Microsoft Services for Network File System (NFS) is a component of Windows Storage Server 2003 R2 that provides a file-sharing solution for enterprises that have a mixed Windows and UNIX environment. Microsoft Services for NFS allows users of UNIX-based computers to store and access files on Windows Storage Server 2003 R2 using the Network File System (NFS) protocol. All of your UNIX clients will be able to access the resources using the NFS protocol with no changes required.

File Server Management

You can use File Server Management to perform many tasks, such as formatting volumes, creating shares, defragmenting volumes, creating and managing shares, setting quota limits, creating storage utilization reports, replicating data to and from the file server, managing Storage Area Networks (SANs), and sharing files with UNIX and Macintosh systems.

File Server Resource Manager

File Server Resource Manager is a new Microsoft Management Console (MMC) snap-in that provides a suite of tools for administrators to understand, control, and manage the quantity and type of data stored on their servers. File Server Resource Manager supports placing quotas on folders and volumes, actively screen files, and generate comprehensive storage reports:

- Placing quotas on folders and volumes to restrict the quantity of data stored.
- Actively screen files stored on the system to prevent certain file types or only allow certain file types defined by the administrator.
- Reporting on storage usage.

Storage Management for SANs

Storage Manager for SANs is a new Microsoft Management Console (MMC) snap-in that helps you create and manage logical unit numbers (LUNs) on fibre channel and iSCSI disk drive subsystems in your storage area network (SAN). Storage Manager for SANs can be used on storage subsystems that support Virtual Disk Service (VDS).

Use Storage Manager for SANs to create and assign LUNs, manage connections between LUNs and the servers in your SAN, and set the security properties for iSCSI storage subsystems.

Distributed File System

The Distributed File System (DFS) solution in Windows Storage Server 2003 R2 provides simplified, fault-tolerant access to files and WAN-friendly replication. Distributed File System consists of two technologies:

- DFS Namespaces. Formerly known as Distributed File System, DFS Namespaces allows administrators to group shared folders located on different servers and present them to users as a virtual tree of folders known as a namespace. A namespace provides numerous benefits, including increased availability of data, load sharing, and simplified data migration.
- DFS Replication. The successor to File Replication service (FRS), DFS Replication is a new state-based, multimaster replication engine that supports scheduling and bandwidth throttling. DFS Replication uses a new compression algorithm known as Remote Differential Compression (RDC). RDC is a protocol that can be used to efficiently update files over a limited-bandwidth network. RDC detects insertions, removals, re-arrangements of data in files, enabling DFS Replication to replicate only the deltas (changes) when files are updated.

Indexing Service

Indexing Service extracts the information from a set of documents and organizes it in a way that makes it quick and easy to access that information through the Search function for computers running Microsoft Windows 2000 or Microsoft Windows XP. This information can include text from within a document (its contents), and the characteristics and parameters of the document (its properties), such as the author's

name. Once the index is created you can query the index for documents that contain key words, phrases, or properties. For example, you can query all documents containing the word "product," or you can query for all Microsoft Office documents written by a specific author. Indexing Service returns a list of all documents that meet your search criteria.

Single Instance Storage

Single Instance Storage (SIS) recovers disk space by reducing the amount of redundant data stored on a volume by identifying identical files, storing only a single copy of the file in the SIS common store and replacing the files with pointers to the file in the SIS common store.

Print Management

Print Management is an updated Microsoft Management Console snap-in that you can use to view and manage printers and print servers in your organization. You can use Print Management from any computer running Windows Storage Server 2003 R2, and you can manage all network printers on print servers running Windows 2000 Server, Windows Server 2003, Windows Storage Server 2003, Windows Server 2003 R2, or Windows Storage Server 2003 R2.

Print Management provides details such as the queue status, printer name, driver name, and server name. You can also set custom views by using the Print Management filtering capability. For example, you can create a view that displays only printers in a particular error state. You can also configure Print Management to send e-mail notifications or run scripts when a printer or print server needs attention. The filtering capability also allows you to bulk edit print jobs, such as canceling all print jobs at once. You can also delete multiple printers at the same time.

Administrators can install printers remotely by using the automatic detect feature, which finds and installs printers on the local subnet to the local print server. Administrators can log on to a local server at a branch location by using Remote Desktop and then easily install printers remotely.

Windows SharePoint Services

Microsoft Windows SharePoint® Services is an integrated portfolio of collaboration and communication services designed to connect people, information, processes, and systems both within and beyond the organizational firewall. Windows SharePoint Services Service Pack 2 is included in this release of Windows Storage Server 2003. When you install Windows SharePoint Services, you get the following features:

SharePoint sites – file storage plus collaboration: Web sites based on Microsoft Windows SharePoint Services 2.0 provide a place where teams can communicate, share documents, and work together on a project. SharePoint sites include:

- Team collaboration features, such as event calendars, contacts, Web links, discussions, issues lists, announcements, and much more.
- Document libraries, which are places where users can store and retrieve documents while taking advantage of rich features such as check-in and check-out, version history, custom metadata, and flexible, customizable views.
- Web Parts, which can provide data access, Web services, and many other applications and content to SharePoint sites.

Site users can contribute to the site by using nothing more than a Web browser. However, if users have Windows SharePoint Services-compatible client programs, such as Microsoft Office 2003, installed on their computers they can work seamlessly with the site, saving files to libraries, editing documents in the client program, and moving or linking that information to the site.

SharePoint Central Administration – Web browser interface for managing your server: You can manage a single server or an entire server farm running Windows SharePoint Services from a Web browser interface called SharePoint Central Administration. Use SharePoint Central Administration to extend a virtual server, create sites or turn on Self-Service Site Creation so users can create their own

sites, manage security settings, manage the list of servers in your server farm, and so on. If you prefer, you can also use the Stsadm.exe command-line utility to manage your servers running Windows SharePoint Services.

Applications for Windows SharePoint Services – download and install ready-to-use applications to get working quickly: Boost worker productivity by downloading and installing an application for Windows SharePoint Services. These applications are tailored to address specific processes or tasks. There are many to choose from, including recruiting, project management, help desk issue tracking, timesheet and scheduling, event planning, and more. Use the applications as soon as you install them or customize them further to meet your organization’s specific needs and requirements.

Additional products and services

The following sections describe the products and services that come with the IBM storage server.

All products and applications except ServeRAID Manager and the IBM Director agent are preinstalled. This section includes the procedures to install these applications.

IBM Director Agent

IBM Director is a comprehensive systems-management solution. It provides a powerful suite of tools and utilities to automate many of the processes required to manage systems proactively. For example, you can use it to perform preventive maintenance, diagnostic monitoring, and troubleshooting. An interface provides easy access to both local and remote systems.

The IBM Director agent is not installed. To install the IBM Director agent, complete the following steps:

1. Click **Start** → **Run**. The “Run” window opens.
2. Type `c:\drivers\director\dir5.10.2_agent_windows.exe`.
3. Click **OK**. The IBM Director agent is installed.

See the IBM Director documentation on the *IBM Director* CD that comes with the IBM storage server for more information.

IBM Tivoli Continuous Data Protection for Files

Tivoli Continuous Data Protection for Files is a real-time, continuous data protection solution for workstations and laptop computers. Instead of waiting for a scheduled interval, Tivoli Continuous Data Protection for Files backs up your most important files the moment they are saved by creating a copy locally for “anywhere restore” and sending a copy to the file server.

Each time a client saves a document, the software will immediately and transparently make a versioned copy locally (on the hard disk) and it will queue-up a copy to be transmitted to the File Server that it is deployed from.

For more information, click the Tivoli CDP icon on the desktop.

ServeRAID Manager

Use this program to configure arrays and logical drives on the ServeRAID controller. ServeRAID Manager operates in two ways: in startable-CD mode and as an installed program. ServeRAID Manager is not preinstalled. The files are on the hard disk. To install ServeRAID Manager, double-click the **Install ServeRAID Manager** icon on the IBM storage server desktop.

Note: ServeRAID version 8.25 or later is required for the DS300 or DS400 attached disk subsystems. The software is available for download at

<http://www.ibm.com/pc/support/site.wss/document.do?lnocid=MIGR-61707>

See the *IBM ServeRAID User's Reference* on the *IBM ServeRAID Support CD* for detailed instructions for using this program.

Recovering the IBM storage server

Use the recovery process to restore the IBM storage server product to its original default configuration after an unrecoverable system failure has occurred. The recovery process formats the hard disks and reinstalls the operating system, device drivers, and applications.

Attention: Make sure that you have saved all data from the primary partition and all locally attached secondary partitions of the IBM storage server before you perform this procedure.

To recover the IBM storage server, complete the following steps:

1. Turn off the IBM storage server.
2. Disconnect the server from all external networks, including storage networks such as Fibre Channel.
3. Connect power, keyboard, monitor, and mouse to the IBM storage server.
4. Press the power-control button.
5. Make sure that the redundant array of independent disks (RAID) configuration is correct. If you have created new RAID logical drives, the first array must be at least 36 GB.
6. Insert the IBM storage server media 1 of the *Recovery CD*, into the CD drive. The IBM storage server recovery CD automatically starts, and the Recovery Main Menu is displayed.
7. Press Enter to start the recovery process. The terms and conditions are displayed.
8. Read the terms and conditions. Click **Y** if you accept the conditions. The ATTENTION - READ THIS BEFORE YOU CONTINUE screen is displayed.

Attention: This is the last opportunity to stop the recovery process. All unsaved data will be lost when the recovery process is started.

9. Read the information and click **Y** to start the recovery process. A status window opens during the recovery process.
10. Remove *Recovery CD*, Media 1 and insert the remaining IBM storage server Recovery CDs into the CD drive when you are prompted.
11. When the last CD has been removed, press Enter. The installation process can take up to 1 hour to be completed. The "Log on to Windows" window opens.
12. Type the user name and password. The default user name is administrator, and the default password is passw0rd.
13. Click **OK**. The IBM storage server desktop is displayed.
14. Click **Shut Down**.
Go to "Installing the IBM storage server" on page 1.

IBM storage server solution help information

Problem determination for your IBM hardware is provided through IBM Services. See <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

If possible, be at your computer when you call and have the following information ready:

- Machine type and model
- Serial numbers of your IBM hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Technical assistance for the IBM storage server software is provided through IBM Operational Support Services SupportLine offerings. These fee-based service offerings provide assistance for configuring and installing software. For more information, and support telephone numbers, see <http://www.ibm.com/planetwide/>.

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