IBM

Introducing Windows Small Business Server 2003 on IBM eserver xSeries Servers

- Describes the products from Microsoft and IBM
- Explains how to install Windows Small Business Server 2003
- Suggests ways consultants can help customers

Rok Rebolj
David Watts

Redpaper

ibm.com/redbooks

International Technical Support Organization

Introducing Windows Small Business Server 2003 on IBM @server xSeries Servers

November 2004

Note: Before using this information and the product it supports, read the information in “Notices” on page v.

First Edition (November 2004)

This edition applies to Windows Small Business Server 2003 running on IBM @server xSeries servers.

Contents

Notices

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

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

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:
IBM Director of Licensing, IBM Corporation, North Castle Drive Armonk, NY 10504-1785 U.S.A.

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

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

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

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

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

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

COPYRIGHT LICENSE:
This information contains sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM's application programming interfaces.

Trademarks

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

@server®	Chipkill™	Redbooks™
@server®	DB2®	ServeRAID™
Redbooks (logo)  ™	IBM®	Workplace™
ibm.com®	Lotus®	Xtended Design Architecture™
xSeries®	Netfinity®	

The following terms are trademarks of other companies:

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

Intel, Intel Inside (logos), MMX, and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

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

This document contains screen shots as well as portions of whitepapers and presentations from Microsoft Web pages which have been reprinted by permission from Microsoft Corporation.

Preface

Many small businesses have already invested in multiple desktop PCs for their employees, thereby increasing their productivity. The next step in a company's technology evolution is enabling computer users to easily share their computer resources — their information, files, printers, faxes, and even their applications — using a centralized PC server such as an IBM @server® xSeries® server running Windows Small Business Server 2003.

The purpose of this IBM Redpaper™ is to introduce the Windows Small Business Server 2003 product and to give useful decision guidance for prospective customers. It describes the xSeries server offerings in the small business market, specifically prepared for operation with Windows Small Business Server 2003. This document also talks about the role of IT consultants and value-added resellers (VARs) in the process of defining the individual customer needs, proposing and implementing the right solution, and offering additional services for maintaining the small business server solution.

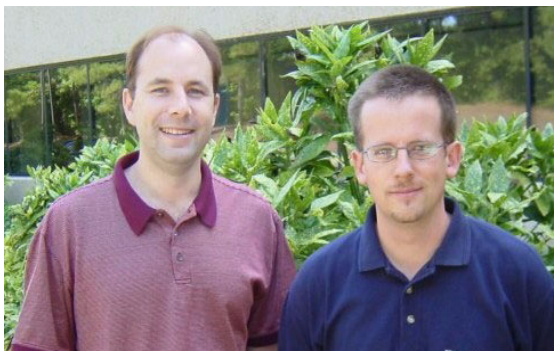
This Redpaper is targeted at IBM® Business Partners and IBM clients wishing to understand the Microsoft® and IBM offerings.

The team that wrote this Redpaper

This Redpaper was produced by a team of specialists from around the world working at the International Technical Support Organization (ITSO), Raleigh Center.

Rok Rebolj is an IT Specialist and instructor in Slovenia. He has 11 years of experience in the IT field. He has a degree in electronics engineering from the University in Ljubljana. His areas of expertise include IBM Netfinity® and IBM @server xSeries servers, Storage Networking, and Systems Management. He holds several hardware- and OS-based certifications, including IBM @server xSeries CSE, MCSE, MCT, and StorageWorks ACE. Rok has co-authored several other IBM Redbooks.

David Watts is a Consulting IT Specialist at the IBM ITSO, Raleigh Center. He manages residencies and produces redbooks on hardware and software topics related to IBM @server xSeries systems and associated client platforms. He has authored over 30 redbooks and redpapers. He has a Bachelor of Engineering degree from the University of Queensland (Australia) and has worked for IBM for over 15 years. He is an IBM @server Certified Specialist for xSeries and an IBM Certified IT Specialist.



The Redpaper team (left to right): David and Rok

Thanks to the following people for their contributions to this project:

Paul Branch, IBM
Derek Brown, Microsoft
Eric Keyser, Microsoft
Becky Ochs, Microsoft
Osman Mohiuddin, Microsoft
Linda Robinson, IBM ITSO

Become a published author

Join us for a two- to six-week residency program! Help write an IBM Redbook dealing with specific products or solutions, while getting hands-on experience with leading-edge technologies. You'll team with IBM technical professionals, Business Partners and/or customers.

Your efforts will help increase product acceptance and customer satisfaction. As a bonus, you'll develop a network of contacts in IBM development labs, and increase your productivity and marketability.

Find out more about the residency program, browse the residency index, and apply online at:

ibm.com/redbooks/residencies.html

Comments welcome

Your comments are important to us!

We want our papers to be as helpful as possible. Send us your comments about this Redpaper or other Redbooks in one of the following ways:

- Use the online **Contact us** review redbook form found at:

  ibm.com/redbooks

- Send your comments in an e-mail to:

  redbook@us.ibm.com

- Mail your comments to:

  IBM Corporation, International Technical Support Organization
  Dept. HZ8 Building 662
  P.O. Box 12195
  Research Triangle Park, NC 27709-2195

1

An Overview of Windows Small Business Server 2003

Today small business owners face the constant pressure to do things faster, better, and with fewer resources. New server solutions must be simple to install as well as easy to operate and maintain. Once operational, these solutions also must pay for themselves right away. The return-on-investment (ROI) paradigm is very important for small businesses today. In fact, ROI has become a matter of survival.

Windows Small Business Server 2003 (SBS 2003) delivers a simple to install, affordable, and dependable server solution for small businesses. It provides features such as e-mail, secure Internet connectivity, business intranets, remote connectivity, support for mobile devices, file and printer sharing, backup and restore capabilities, and an application platform for collaboration.

SBS 2003 is a fourth-generation release. It includes the Microsoft Windows® Server 2003 operating system as the core engine of the product, as well as Microsoft Exchange Server 2003 and Microsoft Windows SharePoint Services. By using this combination of technology and by incorporating innovative management tools, small business customers and technology providers can create a faster and more efficient business environment.

1.1 Why the need for a server?

Many small businesses have already invested in multiple desktop PCs for their employees, thereby increasing their productivity. The next step is to enable users to easily share computer resources such as information, files, printers, faxes, and even applications. Companies can easily share resources by using a centralized PC server, such as an xSeries server running Windows Small Business Server 2003.

How does a server differ from the desktops? From the hardware perspective, servers are more powerful, they are expandable, and they provide reliable technology options that are not available on desktop computers. In addition, the hardware components in servers are designed to run 24x7 and to last longer (also known as *mean-time between failures*). Servers typically have processors that are optimized for server workloads, large amounts of memory, and hardware that is designed to tolerate many hardware failures by using features such as mirrored hard drives, redundant fans, power supplies, and other components. Why are these features important? Business data is now being shared and stored in one central location — the company server. A failure on the server affects not only the server, but the users who are using it.

From a software perspective, servers provide a manageable sharing environment, offering applications that make the workgroup more productive. These programs allow employees to share resources on the server in an orderly way and to share basic functions such as printing, e-mail, and fax services.

1.2 Small business market today

The term *small business market* has different meaning to different people. In this paper, we define a small business market as a business with up to 50 PCs. Why is this market important? Small businesses contribute to a general growth of modern economies. They have an important role in employment and economic gross product, but they are also carriers of innovation and technologic progress.

According to AMI Research, there are more than 41 million small businesses worldwide, including approximately 7.6 million in the United States. Their research shows that 91% of these companies in the U.S. have at least one PC, and 66% have more than one PC. Interestingly, only 30% of small businesses use a network. Approximately 19% use at least one server, and only 6% use more than one server.

1.2.1 Small business opportunity

Let's explore how this market research translates into situations where Windows Small Business Server 2003 is a useful and appropriate solution.

Small business owners today are under pressure to change. They realize that if they want to stay competitive they need to modernize and organize their business using the most up-to-date technology available. Small business owners experience information overload, storing their business data in various places throughout the company. In addition, they often do not integrate their computer systems. This overload of data impacts their ability to continue growing the business. However, they are hesitant to make any changes that won't scale with their projected growth.

Small businesses typically want to send and receive e-mail, store and share data, and work with business-specific applications. The number one concern to these small businesses is protecting their data with a reliable and easy-to-use data backup facility and protecting that

data from computer viruses. Out of those answers, it is clear that small businesses don't usually think about technology first. Instead, it is business needs that spur interest about technologies, which in turn helps them to achieve business goals. To help them, we offer solutions that actually serve these goals.

Windows Small Business Server 2003 is a server solution that provides small businesses with the functions mentioned above, plus the additional features of a secure Internet connectivity, a business intranet, remote connectivity, support for mobile devices, file and printer sharing, backup and restore capabilities, and an application platform for collaboration. In short, Windows Small Business Server 2003 enables small businesses to be more productive with fewer resources.

1.3 Features of Windows Small Business Server 2003

Let's take a look at features and tools offered in SBS 2003:

- Setup

  The improved setup procedure provides an end-to-end solution and includes new tools to improve productivity. Setup is further enhanced by IBM when SBS 2003 and the necessary drivers are preloaded on xSeries servers.

- Adding users and setting up client computers

  You can use updated Client Setup features to create user accounts and to set up client computers quickly and efficiently. New features include:

  - Client network configuration using a Web site instead of a floppy disk
  - User templates
  - The ability to preconfigure client applications
  - Integrated wizards
  - Enhanced mobile and remote-user tools

  These new features make it easier to deploy, configure, and administer both user and computer accounts.

  In previous versions, you could add only one user account at a time. In SBS 2003, you can add multiple user accounts that are based on the same user template by using the Add User Wizard.

- Setting up additional server computers

  You can add one or more additional servers to your network. You can use additional servers to run client or server applications or to enable a Terminal Server connection.

- Networking, e-mail, and Internet connectivity

  Internet access is a must for small businesses in today's marketplace. SBS 2003 includes tools that provide a manageable solution for shared access to the Internet, a firewall to help protect your local network, Internet e-mail based on Exchange Server, and productivity tools such as Outlook Web Access and the Remote Web Workplace™.

- Small Business intranet with Windows SharePoint Services

  SBS 2003 provides a preconfigured internal Web site that is based on Windows SharePoint Services. Windows SharePoint Services is the engine that you use to create Web sites for information sharing and document collaboration. Using this intranet site, co-workers can share information in a collaborative environment. This site includes shared document libraries, announcements, events, and links. The environment allows for easy and flexible deployment, administration, and application development.

- Shared Fax Service

  Microsoft Shared Fax Service enables faxing with fewer telephone lines from users' desktops, at user-set hours. Users can also receive faxes through SharePoint, e-mail, or a printer.

- Remote Access

  To accommodate an increasingly mobile work force, SBS 2003 includes the new Remote Web Workplace, a Web site for remote users that provides access to e-mail, remote desktops, the company's internal Web site, and remote server management capabilities for Administrators. It also includes virtual private network (VPN) capabilities that are easy to set up and use through the Remote Access Wizard.

- Mobility

  SBS 2003 enables mobile users to access their e-mail, schedule, calendar, and task information using cell phones and other portable devices. This feature is built on the Exchange Server 2003 Outlook Mobile Access feature. SBS 2003 simplifies the set up and configuration of the portable devices.

- Server Administration and Management

  SBS 2003 includes updated network administration features to help ensure that the network runs efficiently. Wizards simplify common or repetitive tasks, and preconfigured management consoles provide the necessary tools to manage the network.

- Monitoring and Reporting

  Enhanced tools are available that enable IT consultants and business owners to monitor server activity and to receive performance and usage reports in e-mail or online. You use the monitoring and reporting tools to ensure that the server remains healthy. These tools can reduce downtime by enabling system administrators to respond quickly when issues arise and can increase business productivity and customer satisfaction.

- Backup and Restore

  SBS 2003 offers an integrated backup solution that helps technology providers and novice administrators develop their backup strategy, prepare complete backups, and restore the entire server as well as all of the data that was backed up. This backup solution also provides a reminder for the onsite tape changer and reports the success or failure of each backup operation via e-mail.

1.4 Two editions available

Previous versions have only been available as a single edition. Windows Small Business Server 2003 introduces two editions to meet specific market needs: Standard Edition and Premium Edition.

1.4.1 Standard Edition

Table 1-1 shows the components for SBS 2003, Standard Edition. For more details about these components, see 1.5, “Components of the two editions” on page 6.

Table 1-1 Standard Edition components

Component	Description
Windows Server 2003	Security-enhanced, reliable operating system that keeps data available on an internal network. Includes Microsoft Active Directory and its tools.
Windows SharePoint Services	Facilitates team communications and a collaborative environment.
Exchange Server 2003 technology	A communication, messaging, and collaboration infrastructure that helps increase productivity. Includes Microsoft Outlook Web Access, which lets you access e-mail through the Web.
Outlook 2003	A tool to manage e-mail, calendars, contacts, and other personal and team information.
Shared Fax Service	Faxing with fewer telephone lines from users' desktops, at user-set hours, and receiving faxes through Microsoft SharePoint, e-mail, or a printer.
Routing and Remote Access Services (RRAS)	Firewall technology to help secure Internet connections.

1.4.2 Premium Edition

The Premium Edition includes all the components of Standard Edition plus the components listed in Table 1-2.

Table 1-2 Premium Edition components

Component	Description
Internet Security and Acceleration Server 2000	Provides advanced firewall functionality to help secure Internet connections.
SQL Server 2000	Relational database support for line-of-business applications.
FrontPage 2003	Tools for developing sophisticated Web sites or for creating customized solutions for Windows SharePoint Services.

Upgrading from older versions: If you are upgrading or migrating from an existing Small Business Server (4.5 or 2000) environment, note that we recommend the Premium Edition for your upgrade. If you perform an in-place upgrade on an existing server, you must upgrade to the Premium Edition. However, if you migrate to a new server and do not require SQL Server or Internet Security and Acceleration (ISA) Server functionality, you may migrate to either the Standard Edition or the Premium Edition.

Upgrade from the Standard Edition to the Premium Edition

If you have purchased the Standard Edition and later discover you need SQL Server or ISA Server functionality, Microsoft has available the Product Upgrade (Microsoft SKU: T75-00037). For more information about availability and pricing, consult the Microsoft *Pricing and Licensing for Windows Small Business Server 2003* Web page at:

http://www.microsoft.com/windowsserver2003/sbs/howtobuy/pricing.mspx#ENAA

1.5 Components of the two editions

This section provides details about the components that make up the two SBS 2003 editions.

Windows Server 2003, Standard Edition

Windows Server 2003 is a security-enhanced, reliable server operating system that keeps data available on an internal network. It is capable of handling a diverse set of server roles, depending on the needs. Some of these server roles include:

- File and print server
- Web server and Web application services
- Mail server
- Remote access and virtual private network server
- Directory services, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP) server, and Windows Internet Naming Service (WINS)
- Streaming media server

Windows Server 2003 contains core technologies that build on the strengths of Windows 2000 Server. Windows Server 2003 has capabilities in numerous areas that can make businesses and employees more productive, including:

- File and print services

  It is important to efficiently manage file and print resources while keeping them available and secure for users. As the network expands with more users located onsite, in remote locations, or even at partner companies, IT administrators face an increasingly heavy burden. The Windows Server 2003 family delivers intelligent file and print services with increased performance and functionality, thus reducing total cost of ownership.

- Active Directory

  Active Directory is the directory service for the Windows Server 2003 family. It stores information about objects in the network and makes this information easy for administrators and users to find, providing a logical, hierarchical organization of directory information. Windows Server 2003 brings many improvements to Active Directory, making it more versatile, dependable, and economical. In Windows Server 2003, Active Directory provides increased performance and scalability. It also allows greater flexibility to design, deploy, and manage an organization's directory.

- Management services

  While computing has proliferated on desktops, notebook computers, and portable devices, the real cost of maintaining a distributed personal computer network has grown significantly. Reducing day-to-day maintenance through automation is key to reducing operating costs. Windows Server 2003 contains several important new automated management tools, including Microsoft Software Update Services (SUS) and server configuration wizards. Managing Group Policy is made easier with the new Group Policy Management Console (GPMC), enabling more organizations to better utilize the Active Directory service and take advantage of its powerful management features. In addition, command-line tools let administrators perform most tasks from the command console.

- Storage management

  Windows Server 2003 introduces new and enhanced features for storage management, making it easier and more reliable to manage and maintain disks and volumes, backup and restore data, and connect to storage area networks (SANs).

Exchange Server 2003

Exchange Server, the Microsoft messaging and collaboration server, is software that runs on servers. With Exchange Server, you send and receive electronic mail and other forms of interactive communication through computer networks. Designed to interoperate with a software client application such as Microsoft Outlook, Exchange Server also interoperates with Outlook Express and other e-mail client applications.

With Exchange Server, customers meet the communication requirements for small and large organizations and get easy administration, support, and reliability. Deployment and support tools included in Windows Small Business Server 2003 also make Exchange Server easy to manage.

E-mail messages are sent and received through what is commonly referred to as a client device such as a personal computer, workstation, or a mobile device including mobile phones or Pocket PCs. The client typically connects to a network of centralized computer systems comprised of servers or mainframe computers where the e-mail mailboxes are stored. The centralized e-mail servers connect to the Internet and private networks where e-mail messages are sent to and received from other e-mail users.

Exchange Server offers integrated collaborative messaging features such as scheduling, contact, and task management capabilities. Standard client-side collaboration application is Microsoft Office Outlook 2003, however, Exchange Server also accommodates other client access through its support for Post Office Protocol 3 (POP3) and Internet Message Access Protocol 4 (IMAP4) protocols as well as support for Simple Mail Transfer Protocol (SMTP). Microsoft Outlook Web Access, a service in Exchange Server, accommodates what are known as *thin clients* (Web browser–based access clients).

Exchange Server 2003 supports mobile devices such as Pocket PC and Smartphones. It enables users to synchronize their Inbox, Calendar, Contacts, and Tasks so that they can remotely check appointments and other important information. Mobile device browsers are also supported through Exchange Outlook Mobile Access, which enables HTML, compressed HTML (CHTML), and Wireless Application Protocol (WAP) browser-based devices to access Exchange Server.

Exchange Server 2003 supports the following types of clients:

- Outlook 2003 (MAPI)
- POP3 or IMAP clients
- Outlook Web Access (browser based clients)
- Outlook Web Access Web Parts (embedded into Web Portal)
- Pocket Outlook on portable devices (Pocket PC and Smartphones) using ActiveSync
- Outlook Mobile Access on mobile phones using Mobile Browsers

The Exchange Server collaboration features help users share information quickly and efficiently. Typical collaborative scenarios include maintaining shared address lists that everyone can view and edit, scheduling meetings that include people and conference rooms by viewing associated free or busy schedules, granting other people, such as administrators, access to a user's mailbox. Users can also manage rules for processing messages on Exchange Server, using the flexibility of auto-responses and automatic filing of incoming messages.

In SBS 2003, Exchange Server 2003 is completely integrated with server operating system. Installation of the Exchange Server 2003 is part of the installation and setup procedure of SBS 2003. The configuration and management tools are adapted to the requirements of small businesses.

The advantages of Exchange Server 2003 include:

- Support of real-time Safe and Block lists

  Reduces the amount of unsolicited junk e-mail messages delivered to your organization with connection filtering.

- Inbound recipient filtering

  Reduces unsolicited junk e-mail messages by filtering inbound messages based on the recipient. Exchange Server 2003 rejects messages that are addressed to users who are not found or to whom the sender does not have the permissions to send. This filter applies only to messages sent by anonymously authenticated users.

- Antispam integration with Outlook 2003 and Outlook Web Access

  Uses the Safe and Block Senders List to Exchange Server 2003 for filtering.

- Microsoft Exchange Intelligent Message Filter

  Filters unsolicited junk e-mail messages, and in Outlook 2003, for client-side filtering, uses Microsoft SmartScreen technology to reduce cost and boost productivity.

- Mailbox Recovery Center

  Supports bulk reconnection of mailboxes to the appropriate user in Active Directory directory service to support disaster recovery scenarios. It is possible to scan the mailbox database and determine all disconnected mailboxes, automatically match user mailboxes to user accounts in Active Directory, recover individual or multiple mailboxes, and identify conflicts.

- Volume Shadow Copy service

  Supports the Volume Shadow Copy service implemented in Windows Server 2003. The copy service functionality enables a nearly instantaneous backup and restore, because a mirror copy of the database exists at any time and can be used for restore processes.

- Move Mailbox tool

  Eases mailbox movement from one server to another or to a different Exchange Server store by selecting multiple mailboxes.

Outlook 2003

Microsoft Outlook 2003 provides an integrated solution for managing and organizing e-mail messages, schedules, tasks, notes, contacts, and other information (see Figure 1-1). Outlook 2003 delivers innovations for managing communications, organize work, and work better with others—all from one place. Outlook 2003 runs on Windows-based computers and communicates with the server running Exchange Server through the MAPI protocol that includes powerful messaging and rich collaboration capabilities.

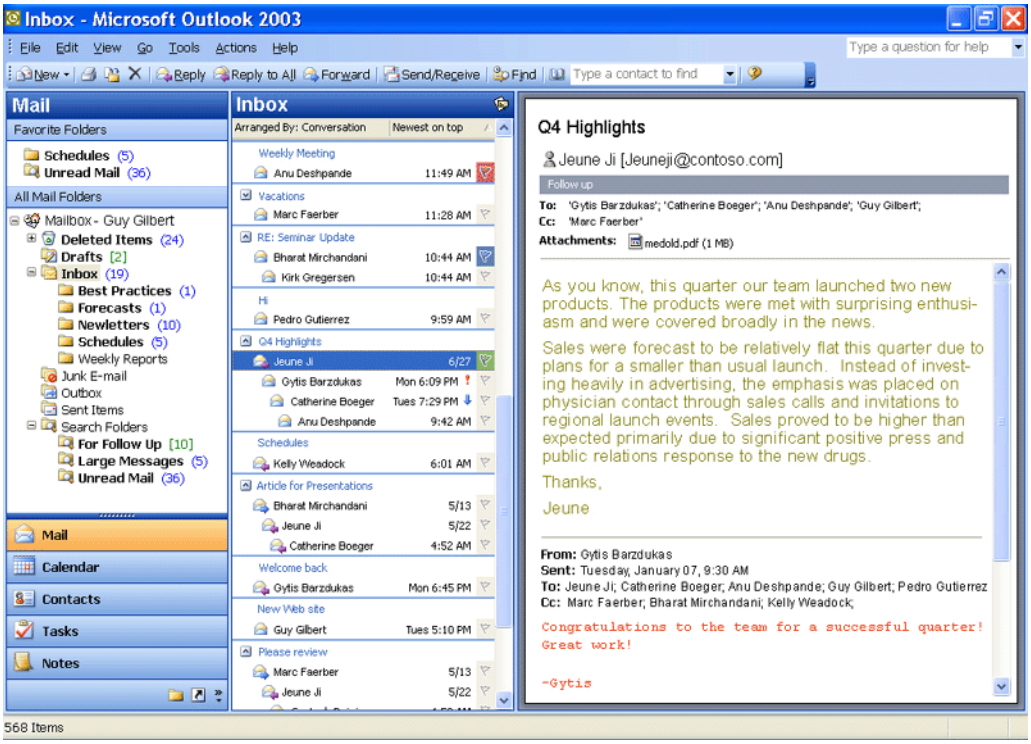


Figure 1-1 Outlook 2003

Microsoft Outlook 2003 enables you to organize information, to save time, and to be more productive. Users can:

- Manage all e-mail in one place

  Access, send, and receive e-mail messages from multiple accounts, including work, personal, or Web-based e-mail accounts such as MSN Hotmail, within a single view.

- Print less, read more

  Read e-mail messages online comfortably and easily, including long messages. The Reading Pane that is on the right side of the screen displays twice as much content, thus reducing how much you need to scroll to read long messages.

- Save time and find messages faster

  Find e-mail messages easily by grouping messages by date, size, conversation, subject, importance, or other criteria.

- Organize the Inbox

  Use Quick Flags to flag messages by priority or time sensitivity and find them in whatever folder they reside.

- Automatically organize messages and receive reminders

  Use enhanced Rules and Alerts to organize incoming e-mail messages according to preferences and automatically trigger alerts to remind or alert when needed, such as when tasks are due or when meetings are about to begin.

- Find messages easily

  Save the results of commonly used searches as Search Folders instead of having to re-run common searches. Search Folders provide an automated way to keep relevant e-mails together, without moving them to other folders. Search Folders require a connection to Microsoft Exchange Server 2003.

- Access Contacts, Calendar, and Tasks quickly

  Use the new Navigation Pane to access Contacts, Calendar, Tasks, Folders, Shortcuts, and Journal and find the information you need to answer e-mail messages, schedule appointments, and finish projects.

- Prevent junk mail

  Use the new Junk E-Mail Filter to prevent junk e-mail messages from flooding the Inbox.

- Block unwanted attachments

  Block e-mail messages and files from people not on the Safe Senders list to help prevent unwanted attachments and bulky files from taking up too much storage space. Users can examine and approve the message before Outlook 2003 downloads the full message and file.

- Read e-mail messages regardless of the connection

  Remain productive during network downtime using the new Cached Exchange Mode. This mode downloads messages and other Outlook 2003 data to a client computer. Cached Exchange Mode requires a connection to Exchange Server 2003.

- Connection awareness

  Indicate whether you have a fast or a slow connection, and Outlook 2003 adapts its performance by displaying either a preview of a message or the full message, depending on the network speed.

- Find facts quickly

  Use the new Research task pane to bring electronic dictionaries, thesauruses, and online research sites into Outlook 2003. Users can find information and incorporate it into messages quickly. Some functionality in the Research task pane requires a connection to the Internet.

- Communicate instantly with others

  Initiate IM conversations quickly in messages, Contacts, Calendar, and other areas in Outlook 2003. No need to leave Outlook 2003 to find out if an instant messaging (IM) contact is online.

- Work together better

  Save e-mail message attachments to shared workspaces where other team members can get the latest versions, check files in or out, or even save task lists, related files, links, and member lists. It is easy to check whether team members are online and then use IM to send them a message. Shared workspaces require running Microsoft Windows SharePoint Services on the server.

- Spend less time coordinating schedules

  Access shared team calendars in Outlook 2003 and view multiple calendars side-by-side to make scheduling meetings fast and more convenient. You can view your own work and personal calendars, calendars in Windows SharePoint Services, or the calendars of others who have granted you viewing rights. Sharing team calendars requires running Windows SharePoint Services on the server.

Windows SharePoint Services

Windows Small Business Server 2003 provides small businesses with a preconfigured intranet site using Windows SharePoint Services (see Figure 1-2). It allows employees to create space for information sharing and document collaboration, increasing individual and team productivity.

Windows SharePoint Services sites provide space to capture and share ideas, information, communication, and documents. Sites facilitate team participation in discussions, shared document collaboration, and surveys. Site content is accessible from both a Web browser and through clients that support Windows SharePoint Services. The document collaboration features allow for easy check in, check out, and document version control.

Windows SharePoint Services site members can find and communicate with their peers and contacts, both by e-mail and with IM. Users can search site content easily. They can receive alerts to tell them when existing documents and information has been changed or when new information or documents have been added. Users can personalize site content and layout on a per-user basis.

Figure 1-2 Windows Sharepoint Services Web site

Microsoft Office programs use Windows Sharepoint Services site content (see Figure 1-3). You can read and edit all of a site's collaborative content — for example, documents, lists, events, task assignments, and membership rosters — within Word 2003, Excel 2003, and PowerPoint 2003. You can also edit Web-based photo libraries. Outlook 2003 allows you to view Windows SharePoint Services site event calendars side-by-side with personal calendars. It also creates meeting-specific workspaces to facilitate group appointments.

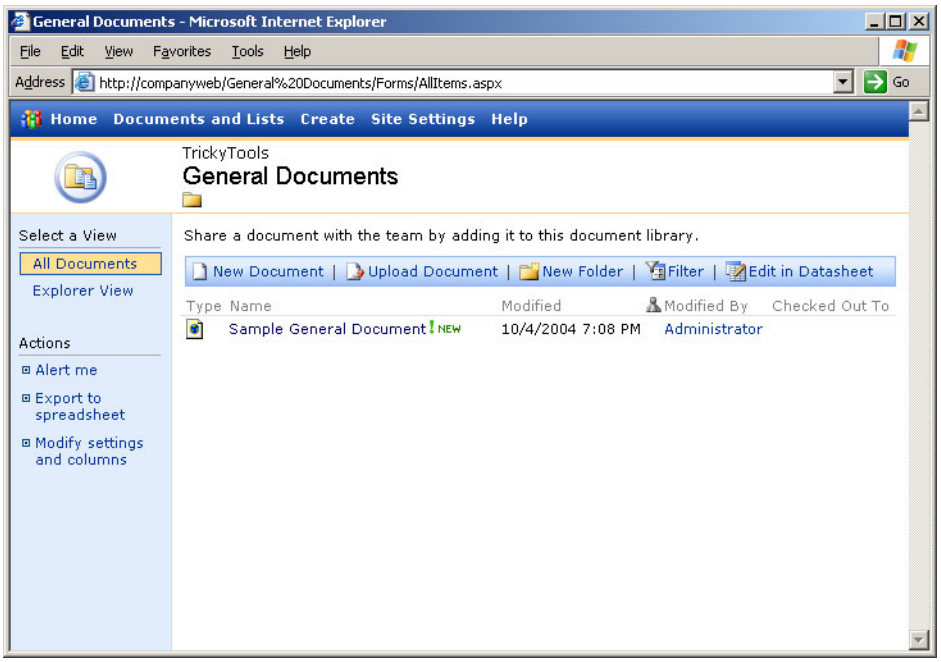


Figure 1-3 Windows Sharepoint Services documents

Server administrators can customize the content and layout of the company site to ensure that employees can access and work with important and relevant information. They can also monitor and moderate users' participation when necessary. Security and task responsibilities are both flexible and easily accessible. You can save well-designed lists and the entire site as templates and then individuals, teams, or business units across the company can reuse the templates as needed. Administrators can achieve all aspects of management through the Server Management console, as shown in Figure 1-4 on page 13.

Note: The central administration for the Windows SharePoint Services site is set to port 8081. Thus, the administrator can connect and manage the intranet site with a browser by entering `http://companyweb:8081` and logging in with administrator credentials.

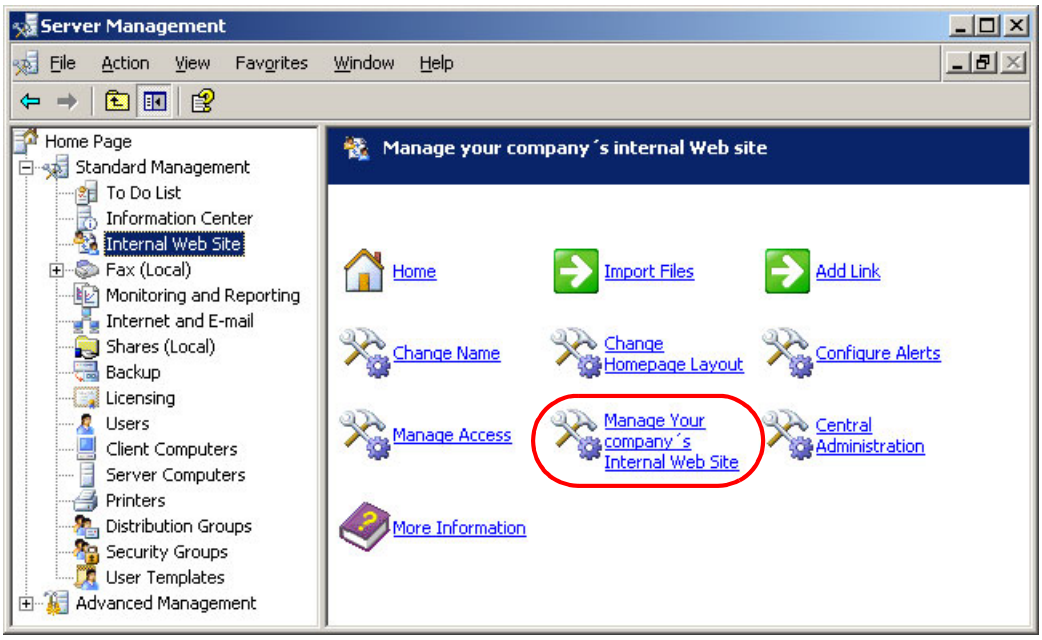


Figure 1-4 Managing the site using Server Management

An instance of Microsoft Data Engine (MSDE) is installed as the database that Windows SharePoint Services uses.

Shared Fax Service

With Fax Service included in Windows Small Business Server 2003, users can send faxes from their desktop through a shared fax modem or interface. This service eliminates the need for each client computer to have its own modem and a business to have multiple fax phone lines. Fax Service supports internal and external fax modem devices. It is configured through the Server Management console by starting the Fax Configuration Wizard, as shown in Figure 1-5 on page 14. The administrator can edit company fax information, configure outgoing and incoming devices, set calling times and priorities, and manage the fax queue. Depending on their permissions, users can view the status of faxes in the queue or cancel their faxes.

Fax Services provide predefined cover page templates, known as server cover pages, or common cover pages (confidential, FYI, generic, and urgent). Using Fax Cover Page Editor, users can create and modify these cover page templates. A cover page provides recipient and sender information such as names, company names, and fax numbers. A cover page is sent as the first page of a multiple page document.

Note: If you plan to use a modem to connect to the Internet, to use Fax Service, or to use remote access through dial-up networking, we recommend that you use a dedicated modem device for each service. Using the same modem for multiple services may result in service conflicts. For example, if the modem is in use for faxing or connecting to the Internet, it cannot host a remote connection.

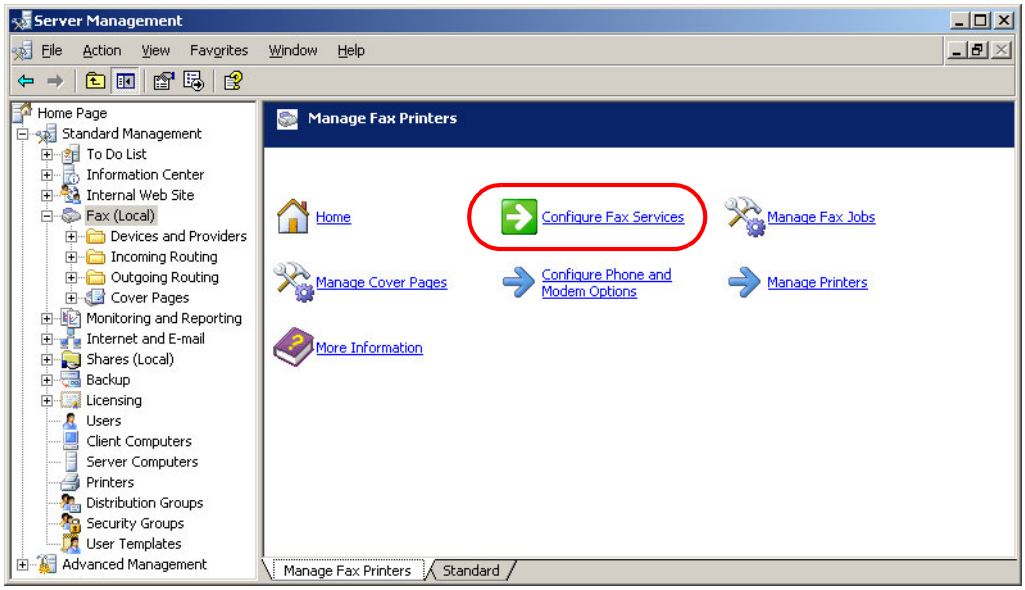


Figure 1-5 Configuring Fax Services

Routing and Remote Access Service

SBS 2003 uses Basic Firewall, a feature of the Routing and Remote Access Service. Basic Firewall protects your local network from unauthorized access from the Internet similar to many hardware-based firewall devices that are available. You can configure Basic Firewall to pass through certain services for users, such as Web-based services, Microsoft Outlook Web Access, and Remote Web Workplace.

You cannot, however, allow or deny access to the Internet by users on the local network based on security groups. For this and other advanced abilities, you need Internet Acceleration Server 2000, which is a component of SBS 2003, Premium Edition.

Tip: Many small businesses already have an existing hardware-based firewall device for their local network. In this case, you use either the hardware-based firewall, Basic Firewall in SBS 2003, or both (for higher security).

ISA Server 2000

ISA Server 2000 is an advanced software-based application-layer firewall, VPN, and Web cache solution for protecting a company's internal network. It provides advanced protection and ease of use as well as fast and secure access for all types of networks. It is particularly well suited for protecting networks that are running Microsoft applications, such as Microsoft Outlook Web Access, Internet Information Services, and Routing and Remote Access Service.

SQL Server 2000, Standard Edition

SQL Server 2000, Standard Edition is a relational database solution for small and medium-sized organizations. It includes the core functionality needed for line-of-business applications, non-mission-critical e-commerce, and data warehousing.

SQL Server 2000 Desktop Engine

SQL Server 2000 Desktop Engine (MSDE 2000) is a free, redistributable version of SQL Server. It is an ideal solution for applications that require an embedded database. SBS 2003

uses MSDE 2000 to store Windows SharePoint Services data. It is automatically installed during installation.

FrontPage 2003

FrontPage 2003, included with Windows Small Business Server 2003, is a tool which provides the features, flexibility, and functionality to build Web sites. It includes the professional design, authoring, data, and publishing tools needed to create dynamic and sophisticated Web sites. Together with Windows SharePoint Services, FrontPage 2003 helps to streamline workflow.

Tip: You can find additional information about components and features of Windows Small Business Server 2003 in *Feature Guide for Windows Small Business Server 2003*, available for download from:

http://www.microsoft.com/windowsserver2003/sbs/evaluation/features/default.mspx

1.6 Planning requirements

Before actual deployment takes place, we recommend that you review the existing hardware, network configuration, and other company information which is important for the SBS 2003 implementation.

1.6.1 Hardware requirements

Table 1-3 outlines the requirements for the server that is running SBS 2003. These requirements are important if you install SBS 2003 on an existing machine.

Table 1-3 Windows Small Business Server 2003 hardware requirements

Component	Minimum	Recommended	Maximum
CPU	300 MHz, Intel® Pentium/Celeron family, AMD K6/Athlon/Duron family, or compatible processor	At least 550 MHz	Multiprocessor support for up to two processors (HyperThreading is supported)
Memory	256 MB RAM	384 MB RAM	4 GB RAM
Hard Disk	4 GB plus space for data storage	6 GB plus space for data storage	Not applicable
Network Adapters	one	one or two, depending on your topology	Not applicable
CD/DVD Drive	Bootable CD or DVD drive	Same	Not applicable

1.6.2 Hardware sizing

The following list provides general rule-of-thumb guidance on selecting hardware based on the number of users with a typical usage pattern. The hardware configuration should reflect the performance and storage capacity requirements of the business, given the number of SBS 2003 clients. The hardware recommendations for this solution focus on two core needs, reliability and server usage.

A low-end configuration is more than adequate for an environment where users require basic network services, e-mail, and low volume file and print sharing. We recommend the xSeries 206, preloaded with SBS 2003.

For a low-end configuration (less than 10 users), we recommend:

- At least a single 1.5-GHz processor
- 512 MB of RAM
- At least two hard disk drives, configured as a RAID array
- At least 40 GB space for data storage
- 10 Mbps or 100 Mbps standard network adapter
- 56 Kbps external modem

Larger and more technology-dependent environments that require high e-mail and file storage capacity and a high level of system performance should use a mid-size or high-end configuration.

For a mid-size configuration (10 to 25 users), we recommend the xSeries 206 and the xSeries 226, preloaded with SBS 2003, with the following configuration:

- Single processor, Pentium® 4 > 2.0 GHz
- Dual power supplies
- Server management card
- 1 GB of RAM
- Hardware RAID using IBM ServeRAID™ or the equivalent
- Three or four hard disk bays, configured as a RAID array
- At least 80 GB space for data storage
- 100 Mbps or Gigabit network adapter
- 56 Kbps external modem or multimodem PCI card

For a high-end configuration (25 to 50 users), we recommend the xSeries 226 and the xSeries 236, preloaded with SBS 2003, with the following configuration:

- Dual processor, Xeon > 2.0 GHz
- Dual power supplies
- Server management card
- 2 GB of RAM
- Hardware RAID using IBM ServeRAID or the equivalent
- 4 to 6 hard disk bays or external array
- At least 120 GB space for data storage
- Gigabit network adapter
- 56 Kbps external modem or multimodem PCI card

Tip: For a discussion of RAID array levels, see Appendix A, “Disk RAID levels” on page 75.

Additional hardware recommendations

Consider the following additional hardware recommendations:

- **CPU**: You can use up to two processors with Windows Small Business Server 2003. Higher-speed CPUs improve performance. Keep in mind that the use of IDE drives, CPU-intensive services, and other CPU-intensive devices may require a higher-speed CPU. In most cases, a 2 GHz CPU provides acceptable performance.
- **Memory**: We recommend a minimum of 512 MB of memory. You can use a maximum of 4 GB of RAM with Windows Small Business Server 2003. We recommend additional memory for memory-intensive services, such as SQL Server.
- **Disk controller**: We recommend a hardware RAID controller (SCSI, SATA). RAID controllers protect the data from failure of any single disk. SCSI RAID controllers have a

much higher throughput. SATA RAID controllers and drives are less expensive. We do not recommend IDE RAID.

- **Hard drives**: You need a minimum of two disks for redundancy. You can configure these as RAID 1. You need three disks for a RAID 5 configuration. RAID 5 provides better utilization of disk space, and you can improve performance by adding more disks to a RAID 5 disk array.

  Disks that you plan to configure in RAID 1 or 5 arrays should be of the same size and have the same disk RPM. Using the same brand and model for the mirrored pair is recommended.

- **Network adapters**: Usually, a 100 Mbps network adapter is sufficient. However, we recommend a Gigabit network adapter for environments that have high network utilization.
- **Fax Modem**: You need a modem or multimodem card for fax services. We do not recommend WinModems for the Small Business Server Shared Fax Service.
- **Redundant power supply**: Power supplies fail from time to time. For increased server reliability, we recommend a redundant power supply.
- **Systems management card**: We recommend a hardware-based systems management card for improved remote management of the server. For more information, refer to 3.1, “xSeries models” on page 56.
- **Backup device**: You need an internal or external backup device. The backup device must meet the planned backup storage requirements concerning data capacity and backup speed.
- **Uninterruptible power supply device**: We recommend an uninterruptible power supply to protect the server from power outages. Select an uninterruptible power supply device that connects to the server and automatically shuts down the server in case the battery is drained.

1.6.3 Network planning

If there is an existing network infrastructure in place, it determines the proposed configuration. The two most common network topologies usually found in small businesses are *peer-to-peer network* and *server-based network*.

In a peer-to-peer network configuration, you connect the computers together to communicate and share data. The computers may connect through an Internet connection device that also provides a firewall service for the local network. If there is no firewall device on the local network, the computers connect through a switch or hub. Additionally, they may share an Internet connection through one computer, or they may not have an Internet connection.

In a server-based configuration, the network includes a computer running a server operating system. The server is the central location for storing data. Additionally, client computers connect to the Internet either through the server or an Internet connection device, such as a hardware-based router or a cable modem. To protect the local network from unauthorized Internet access, many small businesses have a firewall service running on their server or on the Internet connection device.

In a Microsoft server-based network, the server is often a domain controller, file server, or print server. If the server is a domain controller, it manages access to resources on your network, such as user accounts and client computers. To access the resources, users must log on to the domain with a user name and password. With a file server or a print server, there is not a domain to manage resources for the entire network. Instead, the server is used for centrally storing data and for sharing the network printer.

Adding a server to the network

An existing network infrastructure determines some of the SBS 2003 server hardware and software components and, thus, the services these components provide to the network. Depending on whether the network uses a hardware-based firewall device, the server needs to have one or two network interfaces as well as its firewall service enabled, described in the following

- Peer-to-peer with a firewall

  In this configuration, the server running SBS 2003 uses only one network adapter to connect to both the local network and the Internet. SBS 2003 does not provide firewall functionality. Instead, the physical device that provides Internet connectivity provides the firewall.

- Peer-to-peer without a firewall

  Assuming a broadband connection to the site, this configuration requires SBS 2003 to use two network adapters, one to connect to an Internet Connection device (for example, a DSL modem) and the other to connect to the internal network. You should use the SBS 2003 firewall, and the server becomes the gateway for the internal network to access the Internet. For full firewall functionality, we recommend ISA Server 2000, part of SBS 2003, Premium Edition. For detailed installation steps, see “Installing SQL Server 2000 Standard Edition” on page 29.

- Server-based network

  In this configuration, SBS 2003 is either replacing an existing server or is the new domain controller in a multi-server network.

1.6.4 Choosing the installation option

Before you start the actual implementation, you have to determine the installation option most appropriate. Step-by-step guidance for new installation and upgrade is provided in Chapter 2, “Installing Windows Small Business Server 2003” on page 21.

New installation

If you do not already have a previous version of Windows Small Business Server or if this is a new server for the network, there are two options which define the starting point for installation:

- Clean server installation with no operating system installed
- Preinstalled Windows Small Business Server server configuration, such as the xSeries models preloaded with Windows Small Business Server 2003 at the factory

Upgrade or migration

If the you already have a server, the installation option that you choose depends on the existing operating system and hardware.

If the server is running one of the following operating systems, you can choose either an in-place upgrade of the existing server or a complete migration to a new server, depending on the existing hardware:

- Small Business Server 2000
- Windows 2000 Server, Standard Edition
- Windows Server 2003, Standard Edition

If the server is running one of the following operating systems, you must complete a migration to a new server, which means a fresh installation of Windows Small Business Server 2003 on the new machine and additional migration of setup and data:

- Small Business Server 4.5
- Microsoft Windows NT® 4.0 Server

The migration process is outside of the scope of this document. Microsoft has documented in detail the assessment, planning, and implementation steps for such a project in *Implementing Microsoft Windows Small Business Server 2003 Project Guides*. The Project Guides are available for registered business partners at the following Web address:

http://members.microsoft.com/certpartner/projectguides/wsbs2003.aspx

2

Installing Windows Small Business Server 2003

In this chapter we provide a step-by-step description of the installation and configuration procedure for Windows Small Business Server 2003. This chapter is particularly useful to customers and business partners who wish to understand the procedure before they begin.

For a customer who is not migrating from a previous version of Windows Small Business Server, the chapter covers two scenarios for installing and configuring SBS 2003. The chapter also describes the process of upgrading from SBS 2000.

2.1 Configuring Windows Small Business Server 2003 on a preinstalled server

Windows Small Business Server 2003 is available directly from IBM, preloaded on selected IBM @server xSeries servers. For offering descriptions, see Chapter 3, “Windows Small Business Server 2003 on xSeries servers” on page 55.

These preloaded systems provide Microsoft partners and business owners with a fully installed version of Windows Small Business Server 2003, Standard Edition. This preinstallation reduces the time spent that you spend installing a new server. It also keeps the disruption to the business at a minimum. Configuration of a preinstalled server typically takes less than 30 minutes.

When you start a preinstalled server for the first time, the operating system loads, and a Windows Setup wizard guides you through the configuration by prompting you for the company name, domain, and networking information. You need to complete the To Do List after the wizard finishes to set up such things as users, machines, and a backup schedule. See “Step 5: Completing the To Do List” on page 46 for information about how to complete the To Do List.

2.2 Installing Windows Small Business Server 2003 on a new server

There are five basic steps to install and configure SBS 2003 on a new server.

2.2.1 Step 1: Installing the operating system

We recommend that you install the product using the DVD media if the computer supports booting from the DVD drive. The DVD does not require the disk swapping that the CDs require.

1. Turn on the server and insert CD1 or the DVD for SBS 2003 into the CD-ROM or DVD drive. When a message appears asking you to boot from the CD, press any key to do so.
2. The installation starts in character-based mode. After booting from the disk, the Welcome to Setup screen appears. Press Enter.

   Note: If the installation procedure does not recognize the hard disk controller that the server is using (for example, ServeRAID 7i controller integrated on the motherboard of xSeries 206 server), press F6 as soon as you see the prompt. When asked, insert the driver diskette, and press Enter. The corresponding driver is copied to the server. You can download ServeRAID drivers from:

   http://www.ibm.com/pc/support/site.wss/MIGR-495PES.html

3. On the Windows Licensing screen, read the agreement, and then press F8.

4. Create and then select the partition where you want to install the operating system. Minimum requirements for complete installation of server applications and tools are 4 GB and an additional 2 GB for data storage. However, we recommend values that are higher, with at least 6 GB for system and 10 GB for data (or more, depending on the needs), with a comfortable amount of free space for future growth.

   If you are installing on a computer with an existing operating system that does not support an upgrade, we recommend that you delete the partition(s) and then create new ones.

5. When prompted to select a file system for the partition, select the NTFS file system.

   To create the Windows Small Business Server domain, Active Directory is installed which requires an NTFS partition. Setup copies temporary files to a Windows installation folder on the computer, which can take a few minutes. The computer then restarts, and Setup continues in graphical mode.

6. In the Regional and Language Options window, you can customize the settings. Click **Next** to proceed.
7. In the Personalize Your Software window, type the requested information. Click **Next**.
8. In the Your Product Key window, type the license key, which you can find on the back of CD case number 1. Click **Next**.
9. In the Computer Name and Administrator Password window, enter a standard computer name (unique name of up to 15 characters: A through Z, 0 through 9, and the hyphen "-").

   Important: You cannot change the computer name after the installation, because it is used to configure SBS 2003 tools and applications. To change it, you would have to reinstall SBS 2003.

10. Enter the password for the Administrator user ID. Click **Next**.

    Important: For security reasons, we recommend that you specify a strong password for the Administrator account. A strong password is a password that contains between 6 and 127 characters and uses a combination of uppercase and lowercase letters, numbers, and other characters, such as *, ?, or $. Leaving the Administrator password blank indicates no password for the account and poses a security risk.

11. In the Date and Time Settings window, verify the settings. Click **Next**.

Once you have installed the operating system, the computer will automatically restart.

2.2.2 Step 2: Configuring Windows

Before beginning this step, ensure that the local network adapter is connected to a switch or hub that has power. The configuration procedure checks the link on that adapter.

1. Log on to the computer, using the built-in Administrator account. The dialog box shown in Figure 2-1 appears.

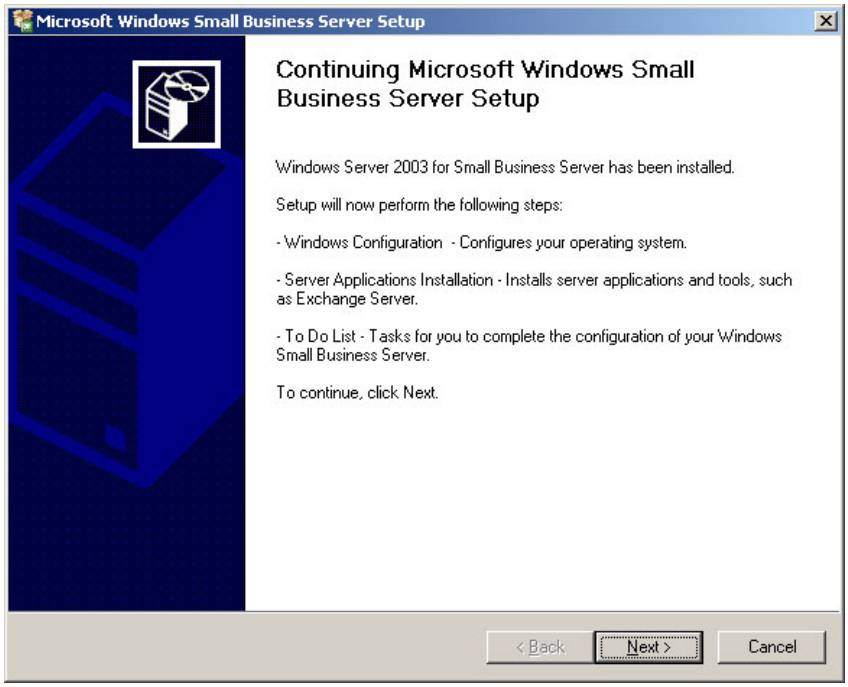


Figure 2-1 Continuing Microsoft Windows Small Business Server Setup

2. In the Continuing Microsoft Windows Small Business Server Setup window, there is a list of the major tasks that the program performs. The last item, the To Do List, is a list of wizards and links that you can use to configure SBS 2003. Unless you are familiar with the applications, we recommend that you use these wizards and links to configure SBS 2003. Click **Next**.

   The Setup Requirements window appears if there are conditions that prevent Setup from continuing, conditions that you should correct before continuing, or information that you need to be aware of during Setup.

3. In the Company Information window, enter information about the company, as in the example shown in Figure 2-2 on page 25. Click **Next**.

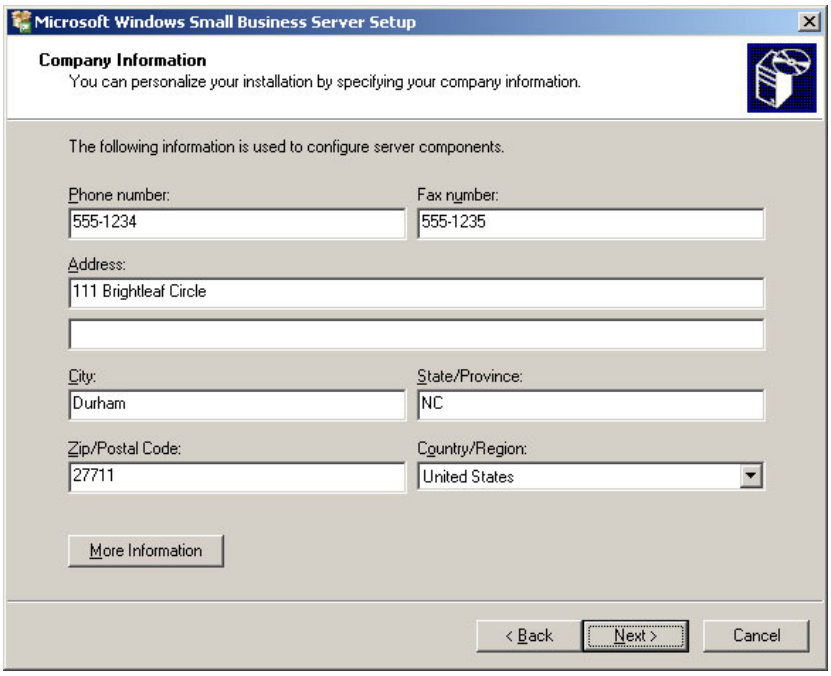


Figure 2-2 Company Information

4. In the Internal Domain Information window, review the default values, which are typical for a small business. Click **Next** to accept the default values, or click **More Information** for details about modifying the values. We recommend that you use the default values.

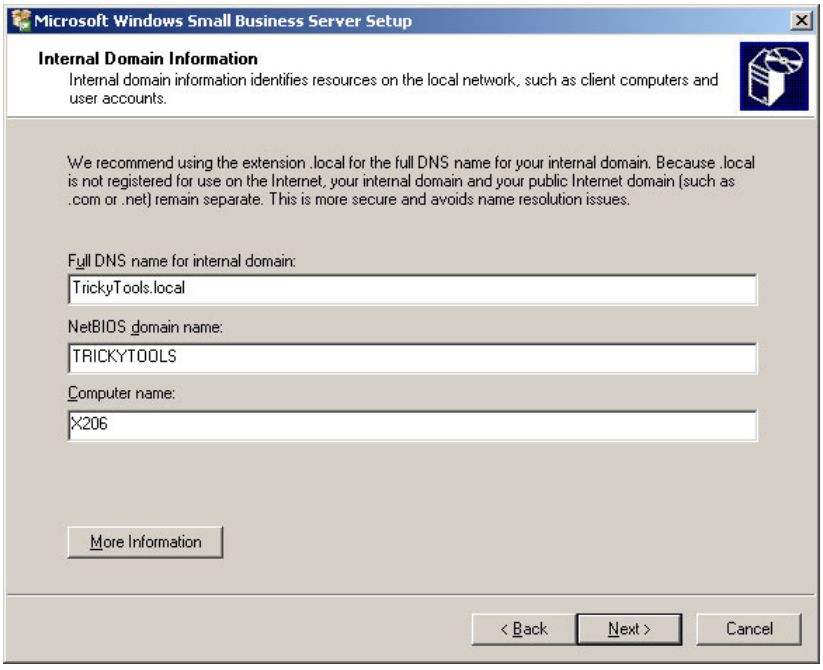


Figure 2-3 Internal Domain Information

Important: After you install SBS 2003, you cannot change the full DNS name for the internal domain, the NetBIOS domain name, or the computer name. These settings are used to configure SBS 2003 tools and applications. To change these names, you must reinstall SBS 2003.

5. If there is more than one network adapter, the Local Network Adapter Information window appears. Select the network adapter that you will use to access the local network. All the network adaptors except the local network adaptor will be disabled for the duration of Setup.
6. In the Local Network Adapter Configuration window, we recommend that you accept the default values. Click **Next**.
7. In the Logon Information window, click **Log on automatically**. Then, type the password for the account with which you are currently logged on. When you select to log on automatically, the setup procedure automatically continues with the component installation after restarting the computer.

   If the default data folder locations for Active Directory were not valid, the Data Folders window appears. You must select the location for each data folder specified in the list.
8. In the Windows Configuration window, click **Next** to install components that must be installed or configured before the setup procedure can continue. The installation takes several minutes to complete.
9. The Component Progress window appears. It lists the progress of component installation and configuration. If the computer must be restarted and you chose to log on automatically, the setup procedure continues without your needing to log on. Otherwise, you must log on using the built-in Administrator account after the computer restarts.
10. When the Component Selection window appears, continue on to Step 3.

2.2.3 Step 3: Installing server applications

To install server applications, follow these steps:

1. In the Component Selection window, applications that are typical for most small businesses are selected by default. To customize this installation, you can modify the selections in the Action and Drive columns. Click **Next**.

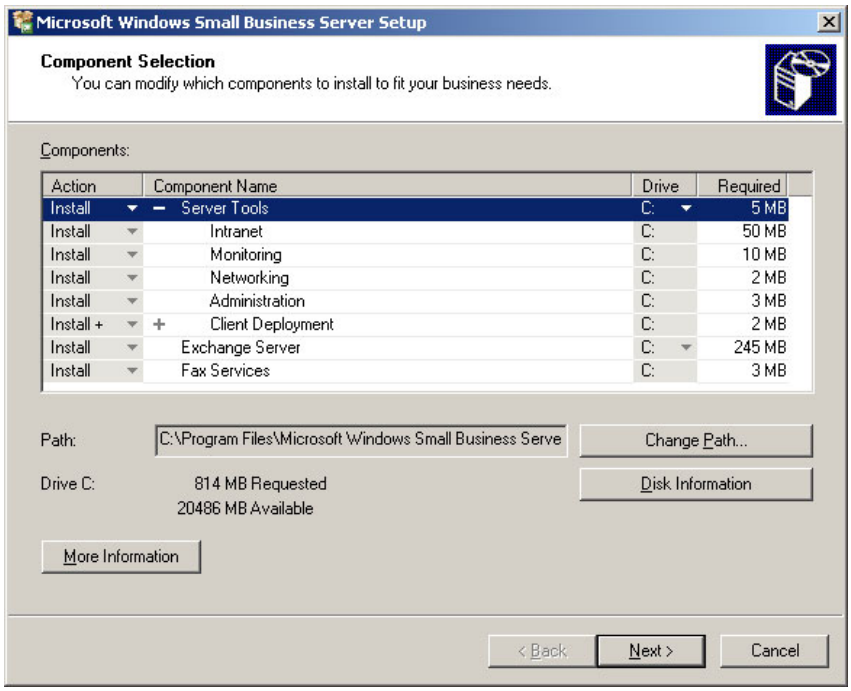


Figure 2-4 Component Selection

2. In the Data Folders window, if there are multiple drives on the server, we recommend that you select a different location for the data folders. The drive should have space for growth and should be formatted as NTFS. To get details on data folders, click **More Information**. Click **Next** to proceed.

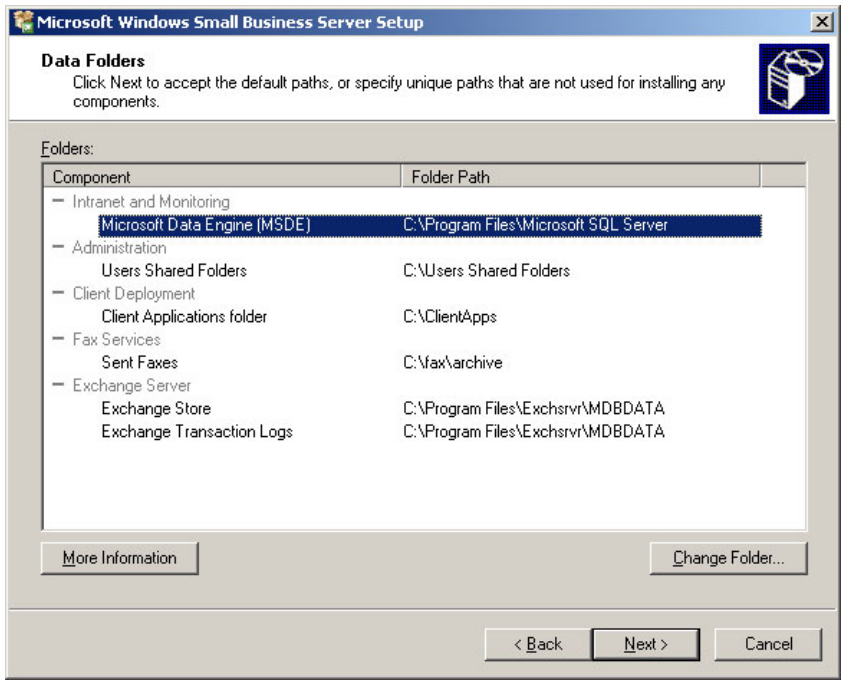


Figure 2-5 Data Folders

3. In the Component Summary window, verify that the installation actions for the list of components are correct. Click **Next**. The Component Progress window appears, providing the status of the installation. For components that require the computer to restart, the setup procedure continues if you selected to log on automatically.

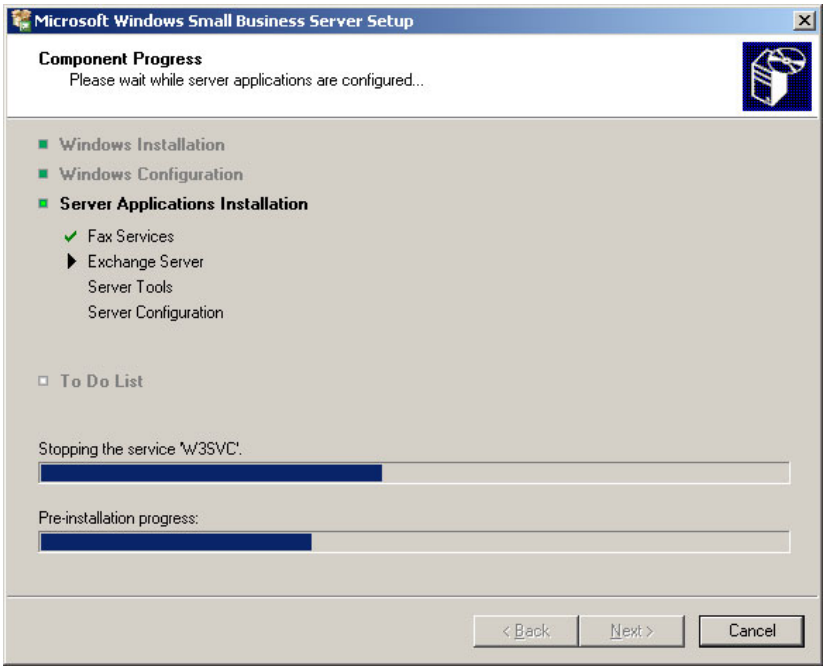


Figure 2-6 Component Progress

What follows is a lengthy procedure, taking 30 minutes to an hour, depending on components selected. If there are errors or messages related to a selected component, the Component Messages window appears. At this point, you need to review the errors or messages.

4. If you started the installation using the CD media, the setup procedure prompts you to insert the CD2 and CD3 as well as the Microsoft Office Outlook 2003 installation CD, as shown in Figure 2-7. Insert the CD-ROMs as prompted, and continue the installation by clicking **OK**.

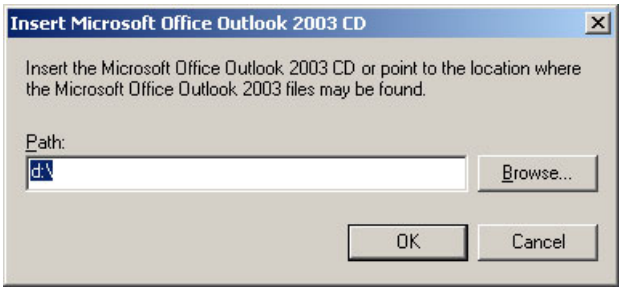


Figure 2-7 CD media change required

5. In the Finishing Your Installation window, click **Finish**, and then click **OK** to restart the computer.

2.2.4 Step 4: Installing SQL Server and ISA Server (Premium Edition only)

You use the Premium Technologies CD to install SQL Server 2000 and ISA Server 2000. You must be logged on as the Administrator account or another account that is a member of the Domain Admins security group to install SQL Server 2000 or ISA Server 2000.

Important: For security reasons, we recommended that you disconnect the server from the Internet until after you have set up Premium Technologies.

Installing SQL Server 2000 Standard Edition

Before you install SQL Server, review the following points:

- As part of installing each instance of SQL Server 2000, you must install SQL Server 2000 Service Pack 3a (SP3a), which addresses known security issues, including the Slammer worm. To do so, follow the instructions discussed in “Installing SQL Server 2000 Service Pack 3a” on page 35.
- Do not upgrade the instance of MSDE installed for Monitoring (SBSMONITORING), because it is not supported.
- To review the SQL Server 2000 release notes, open \SQL2000\Readme.txt on the Premium Technologies disk. To review the SQL Server 2000 SP3a release notes, open \SQL2000_SP3\SP3readme.htm on the Premium Technologies disk.

To install a new instance of SQL Server 2000:

1. From the autorun window of the Premium Technologies CD (Setup.exe), click **Install Microsoft SQL Server 2000**.

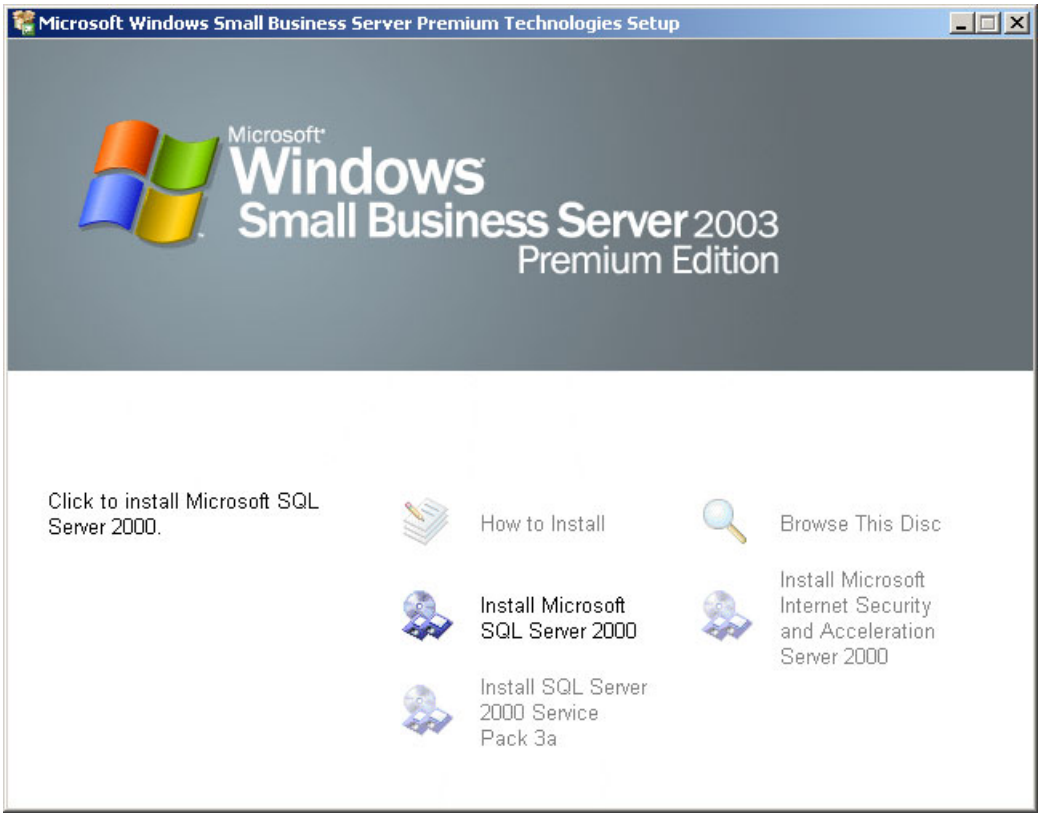


Figure 2-8 Windows Small Business Server 2003, Premium Edition autorun window

2. When the message in Figure 2-9 appears, saying that SQL Server 2000 SP2 isn't supported, click **Continue**. The issue is resolved after you install SP3a as described in "Installing SQL Server 2000 Service Pack 3a" on page 35.

Figure 2-9 SQL Server 2000 SP2 not supported message

3. In the Welcome window, click **Next**.
4. In the Computer Name window, accept the default of **Local Computer** if this is the first server in the network.

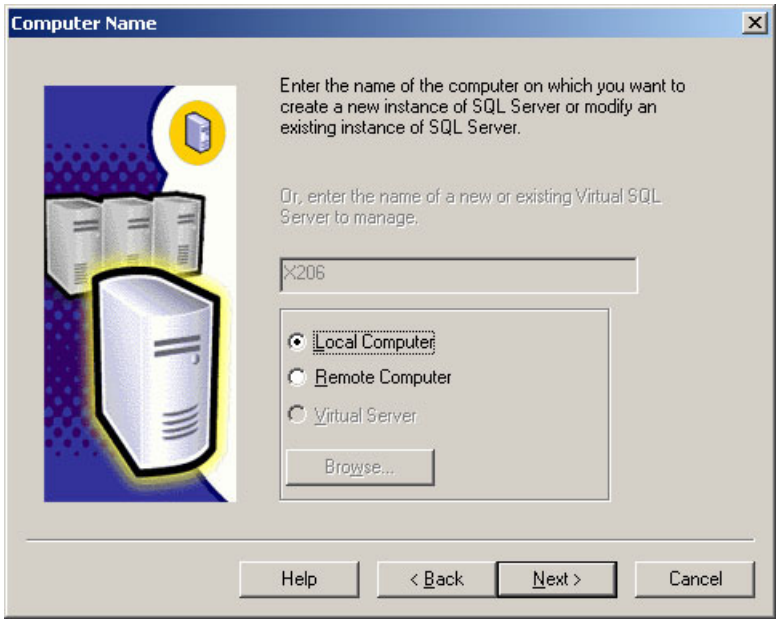


Figure 2-10 Computer Name window

5. In the Installation Selection window (Figure 2-11 on page 31), click **Create a new instance of SQL Server, or install Client Tools**.

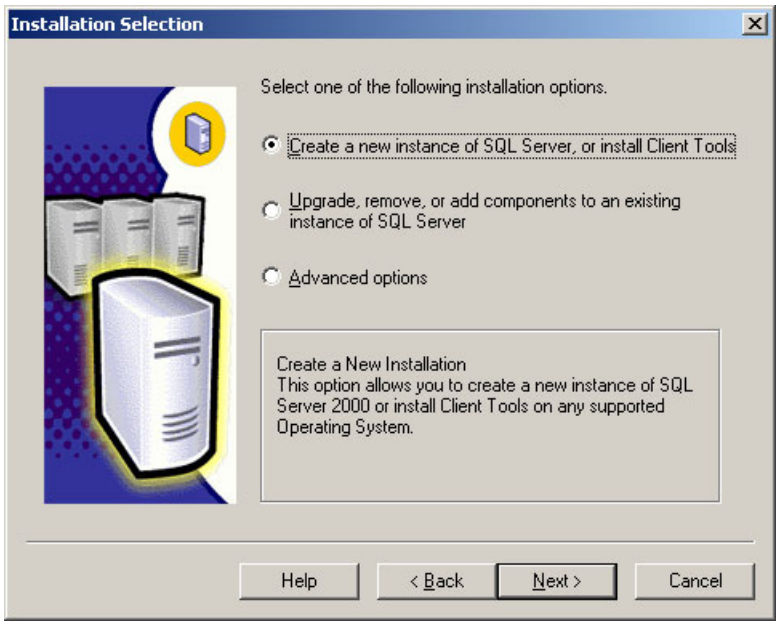


Figure 2-11 Installation Selection window

6. In the User Information window, click **Next** to accept the default information.

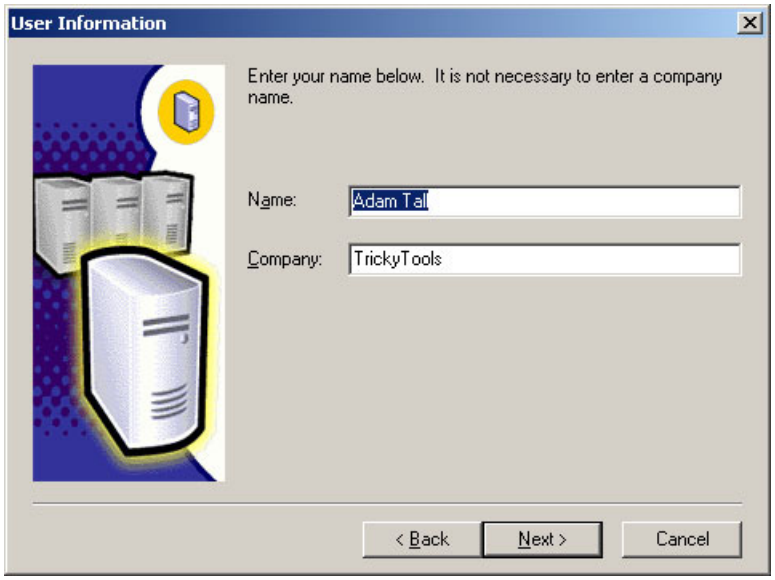


Figure 2-12 User Information window

7. In the Software License Agreement window, review the licensing agreement. To continue, you must accept the agreement.
8. If this is the first instance of SQL Server that you are installing, the CD-Key window appears. Enter your SBS 2003 license key, which you can find on the back of disk case 1. If SBS 2003 came preinstalled on your server, the license key is located on the Certificate of Authenticity (COA). The COA is a multicolored label located on the side or top of your computer.
9. In the Installation Definition window (Figure 2-13 on page 32), accept the default of **Server and Client Tools**.

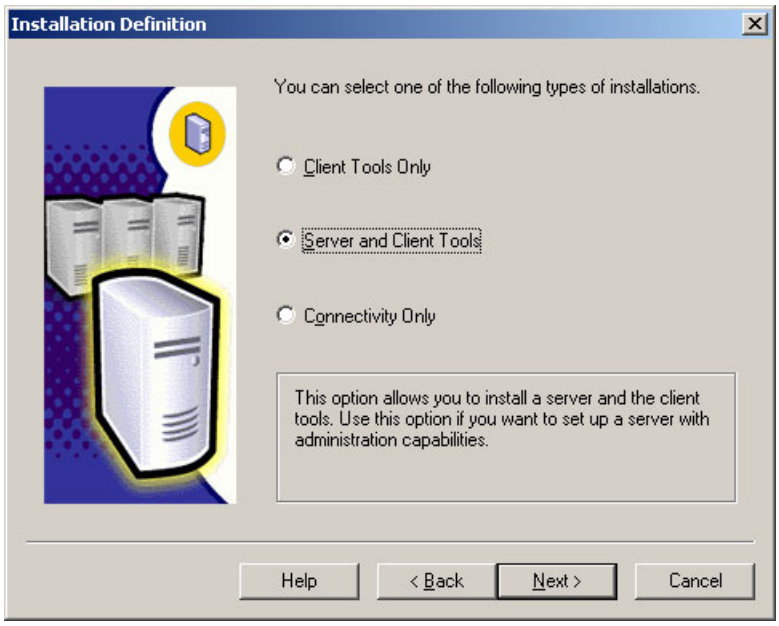


Figure 2-13 Installation Definition window

10. For the Instance Name, accept **Default** as shown in Figure 2-14, or remove the checkmark and enter a specific named instance.

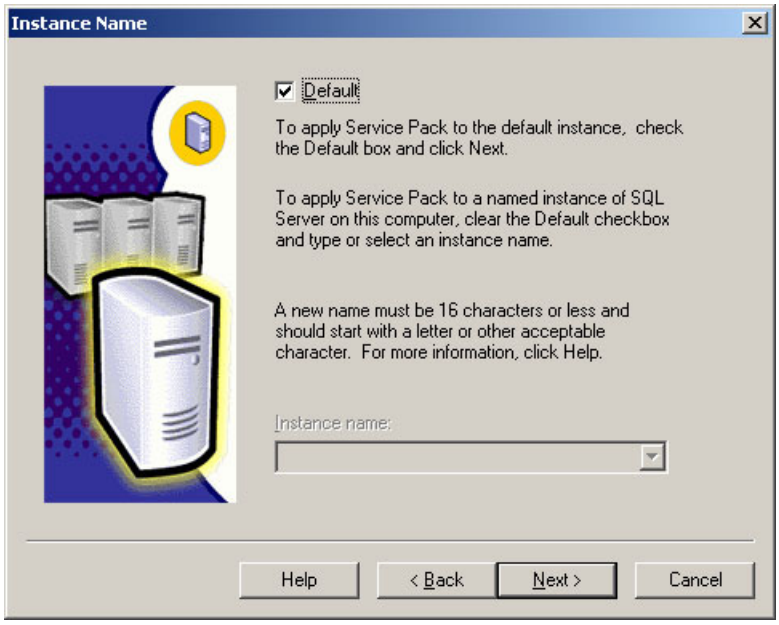


Figure 2-14 SQL Server Instance name

11. In the Setup Type window (Figure 2-15), accept the default of **Typical** unless you need to use specific collation settings or other specific SQL Server installation options.

    Under Destination Folder, you can also specify where to install the program and data files. We recommend that you choose a drive that has enough free disk space to support folder growth. If you have multiple drives on your server, you should save your data to a drive other than the one where the operating system is installed. Storing data on a separate drive improves system performance and simplifies backup and recovery.

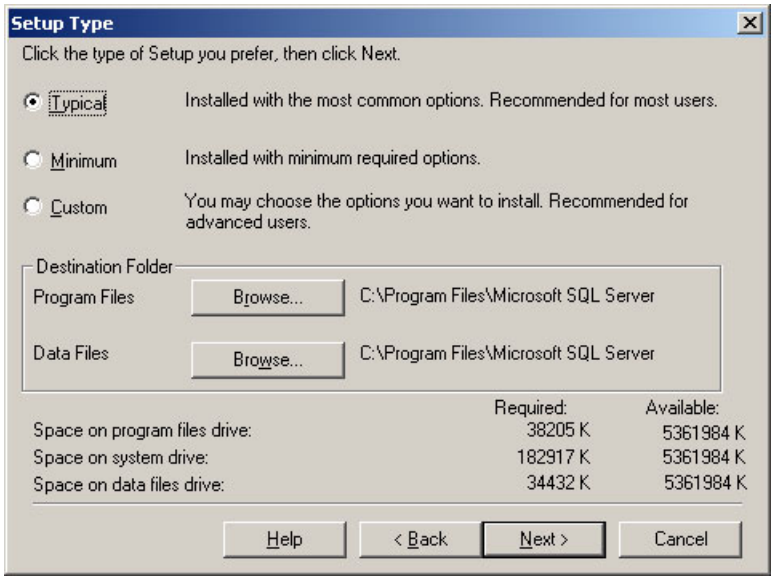


Figure 2-15 Setup type

    You need to perform a custom setup and specify collation settings rather than using the default values if you:

    – Already have an existing SQL Server installation.
    – Are installing SQL Server in a language different from the language used by the client computers connecting to the database.
    – Have an application that depends on settings from a previous version of SQL Server.

    If you need to perform a custom setup, click **Custom** in the Setup Type window, and then follow the instructions.

12. In the Services Accounts window, use the default of **Use a Domain User account**, and then specify the password for your administrator account. Optionally, an even more secure method is to create a new account specifically for accessing SQL Server.

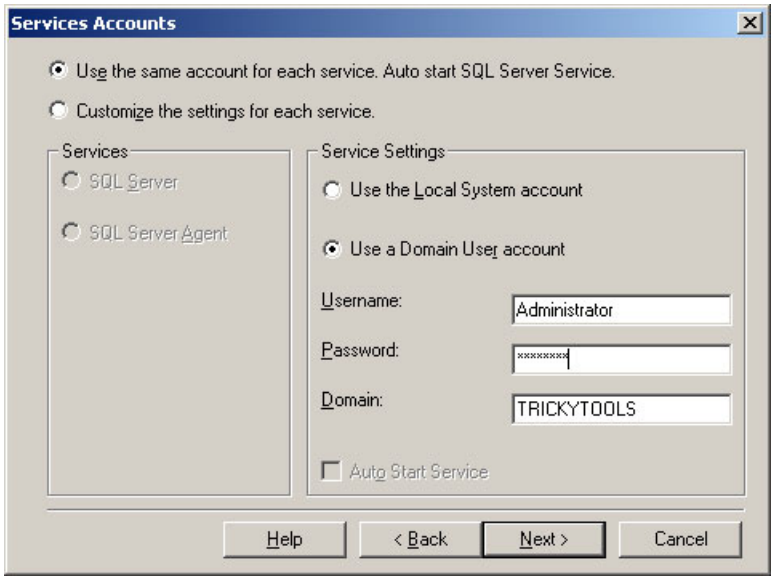


Figure 2-16 Services Accounts window

If you need to create a new account for SQL Server, use the Add User Wizard in Server Management. Click **Start** → **Server Management** → **Users**. In the details window, click **Add a user**. When prompted for the template selection, select **Do not use a template to define user settings**, and then specify Administrators for the security group membership. Do not select the options to create a computer or allocate disk space.

If you enabled password policies for the domain, the password for the services account expires when a password reset is required for all users. You must reset the services account password and then update the password for SQL Server. You must also update the account information if you manually change the user name or password for the account.

To reset the services account password, use the **Change User Password** task on the Manage Users taskpad in Server Management. To update the password for SQL Server, click **Start** → **Run**, and then enter `services.msc`. Double-click the **MSSQLServer** service, click the **Log On** tab, and then update the account information. Then repeat these steps to update the account information for the SQLSERVERAGENT service as well.

13. In the Authentication Mode window, accept the default of Windows Authentication Mode and click **Next**.

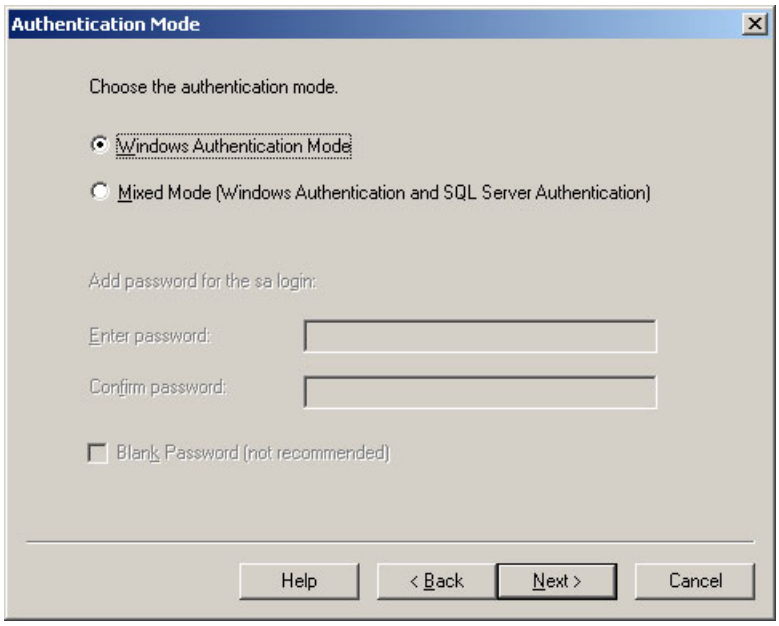


Figure 2-17 Authentication mode

14. In the Start Copying Files window, click **Next** to begin the installation of SQL Server.
15. In the Setup Complete window, click **Finish**.

Now continue to the next procedure to apply SQL Server service pack 3a to the instance of SQL Server that you just installed.

Important: You must install Service Pack 3a for every instance of SQL Server 2000 or MSDE that you are installing on the computer.

Installing SQL Server 2000 Service Pack 3a

To install SP3a to the new instance of SQL Server:

1. From the autorun window of the Premium Technologies disk (Setup.exe), click **Install SQL Server 2000 Service Pack 3a**.

   If you receive a message that the Scm.exe file is in use, restart your server, and then start the SP3a installation again.

2. In the Welcome window, click **Next**.

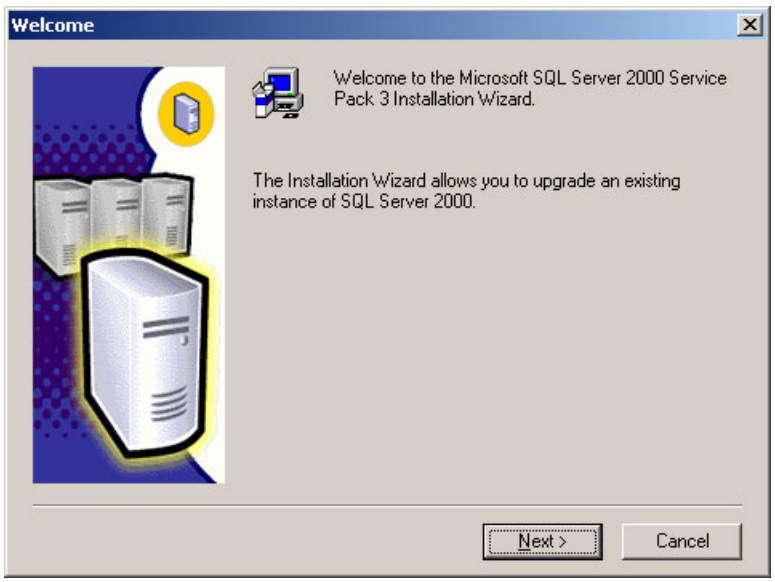


Figure 2-18 Service Pack 3a Welcome window

3. In the Software License Agreement window, review the licensing agreement. To continue, you must accept the agreement.
4. In the Instance Name window, accept the default unless in the previous procedure you specified a different instance name.
5. In the Connect to Server window, accept the default of **The Windows account name I use to log on to my computer with (Windows authentication)** unless you specified a different authentication mode in the previous procedure.

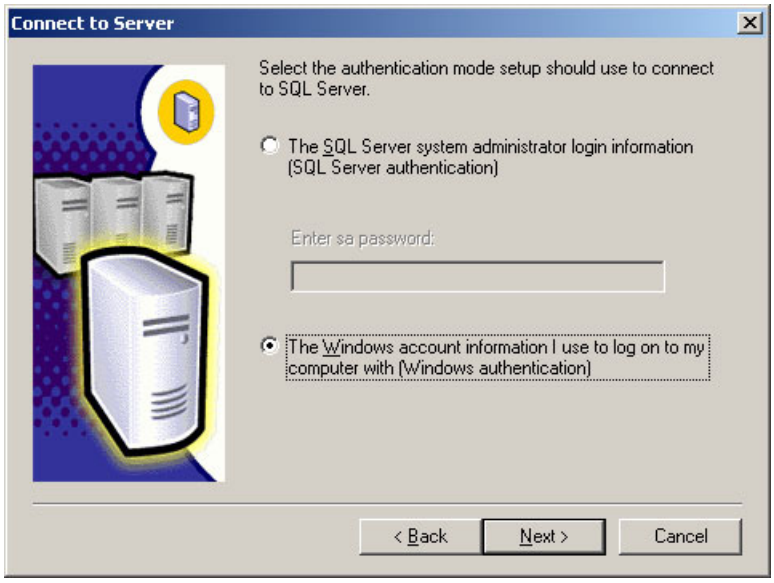


Figure 2-19 Connect to server window

6. When the message that the system administrator (SA) password is blank appears, we recommend that you provide a strong password for this account. A strong password is between 6 and 127 characters, and uses uppercase and lowercase letters, numbers, and other characters, such as *, ?, and $.

Figure 2-20 SA Password Warning window

7. Review the Backward Compatibility Checklist message. If you must modify the SP3a security enhancements, select the appropriate options. For details about each option, click **Help**. Click **Continue** once you have reviewed the security enhancements.

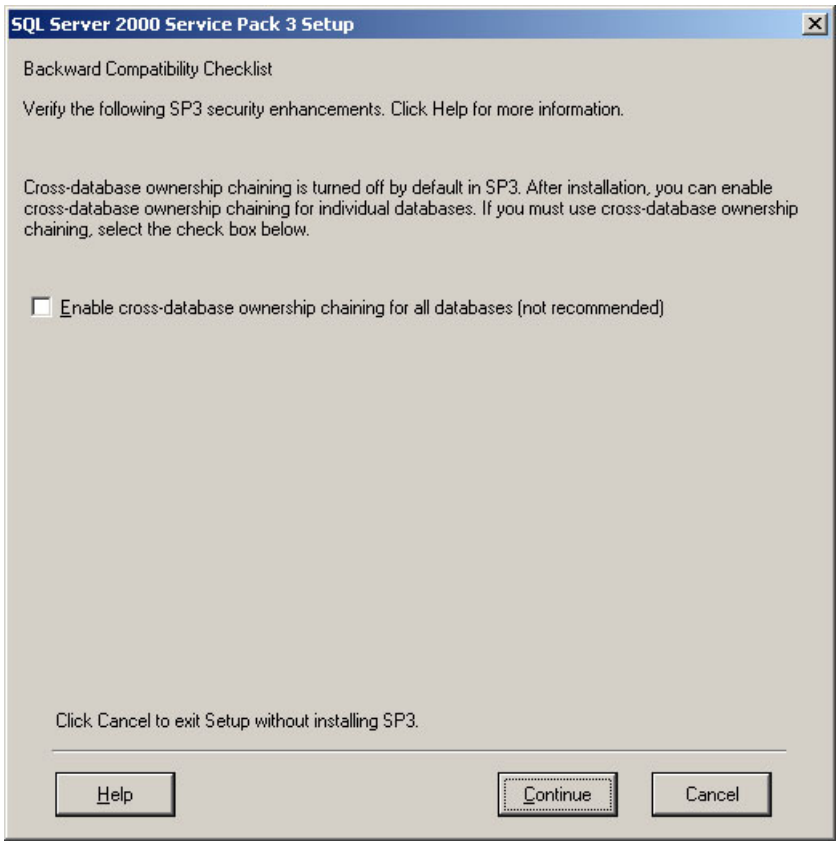


Figure 2-21 Backward compatibility checklist

8. When the Error Reporting message appears, you can select **Automatically send fatal error reports to Microsoft**.
9. In the Start Copy Files window, click **Next**.
10. When a message appears prompting you to back up your databases, click **OK**. We highly recommend that you complete a backup after installing Premium Technologies.
11. In the Setup Complete window, click **Finish**.

    If you receive the following error, you must restart your computer and then run the SQL Server 2000 Service Pack 3a setup again:

    ```
    Error running script: sp3_serv_uni.sql(1) To exit the service pack installer,
    click OK.
    ```

12. Click **Start** → **Run**, and enter **`services.msc`**. If the MSSQLSERVER service is not started, right-click the service, and then click **Start**.

Upgrading the MSDE instance used for Windows SharePoint Services

An instance of MSDE is installed during the SBS 2003 setup as the database that Windows SharePoint Services uses. MSDE is a protected system database that only Windows components can use. You can upgrade MSDE to SQL Server 2000 to add the search capability to the SharePoint site.

To upgrade the instance of MSDE that Windows SharePoint Services uses:

1. From the autorun window of the Premium Technologies disk (Setup.exe), click **Install Microsoft SQL Server 2000**.
2. When the SQL Server 2000 SP2 and below message appears, click **Continue**. The issue is resolved after you install SQL Server 2000 SP3a later.
3. In the Welcome window, click **Next**.

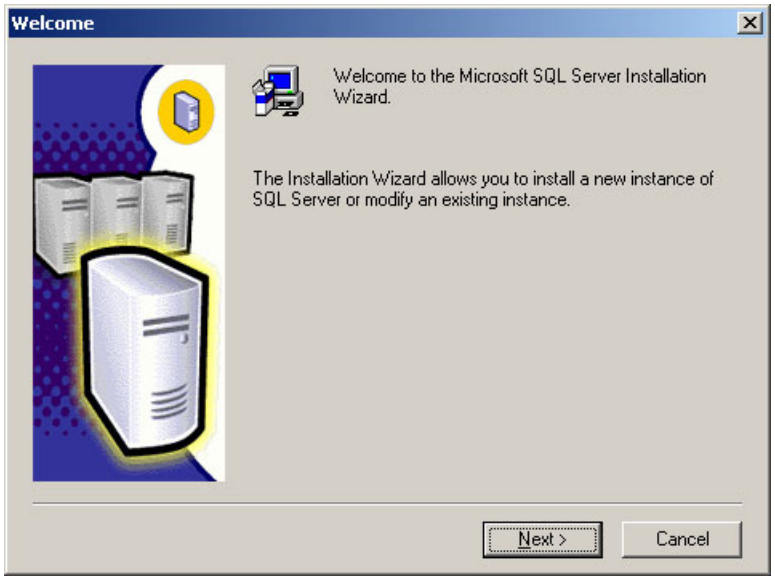


Figure 2-22 MSDE upgrade wizard

4. In the Computer Name window, accept the default of Local Computer (the computer where the MSDE was installed as part of the SBS 2003 setup).

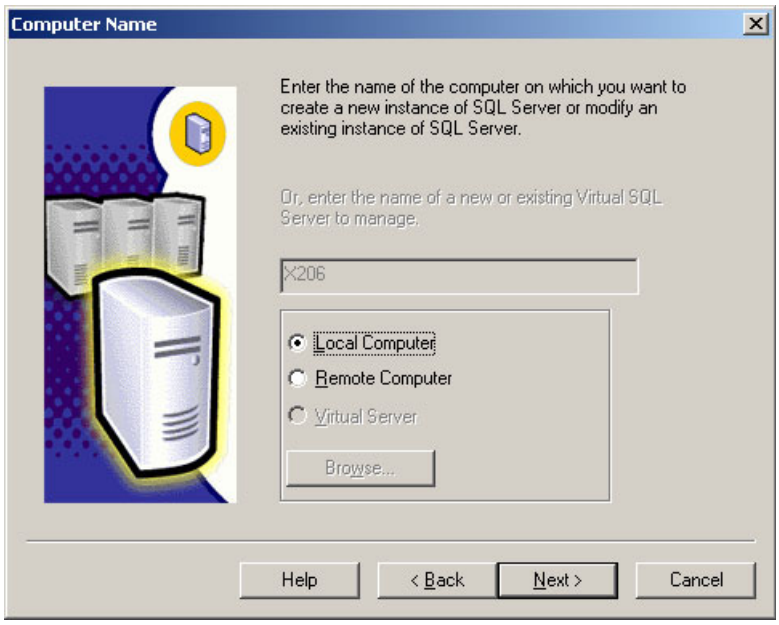


Figure 2-23 MSDE is installed on the local system

5. In the Installation Selection window, click **Upgrade, remove, or add components to an existing instance of SQL Server**.

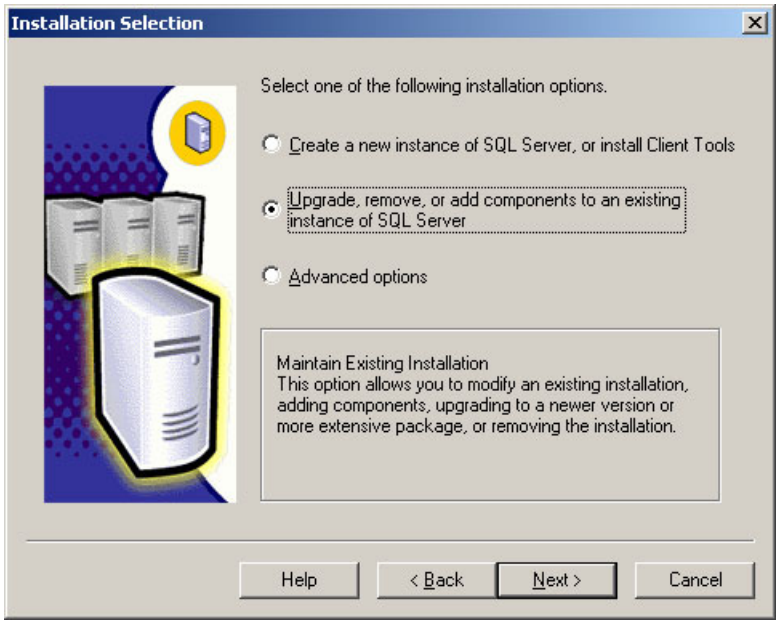


Figure 2-24 Selecting upgrade type of installation

6. In the Instance Name window (Figure 2-25 on page 40), clear the **Default** check box if it is selected. In the Instance name box, select SHAREPOINT.

> **Note:** Do not upgrade the instance of MSDE installed for Monitoring (SBSMONITORING), because it is not supported.

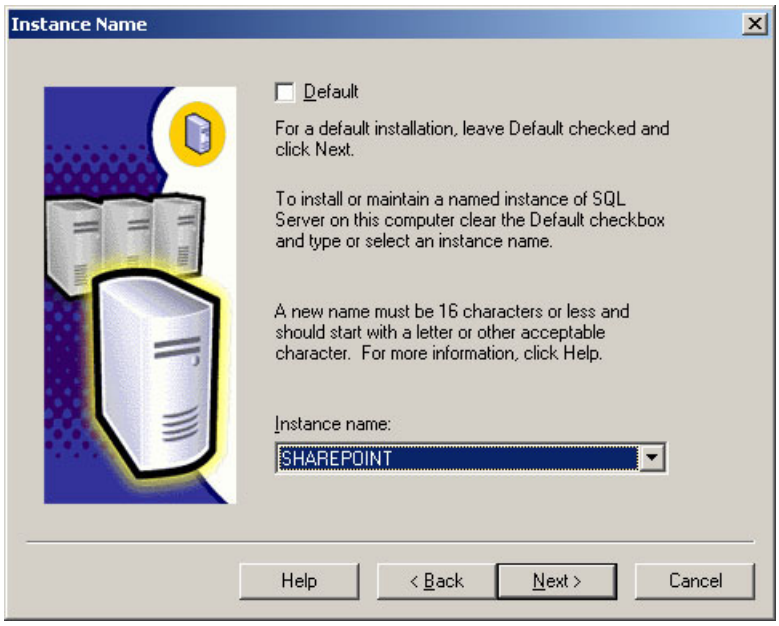


Figure 2-25 Choosing SharePoint instance name

7. In the Existing Installation window, accept the default of **Upgrade your existing installation**.

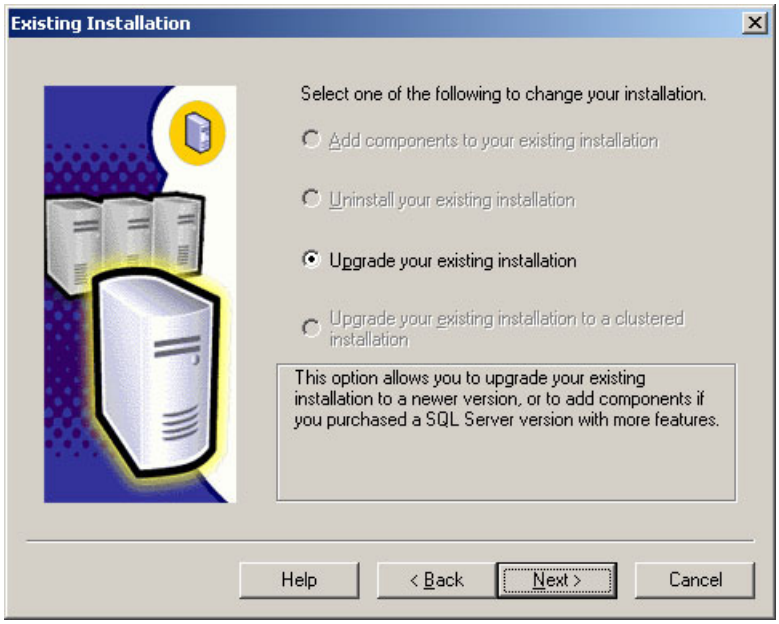


Figure 2-26 Upgrading an existing installation

8. In the Upgrade window (Figure 2-27), select the **Yes, upgrade my programs** check box.

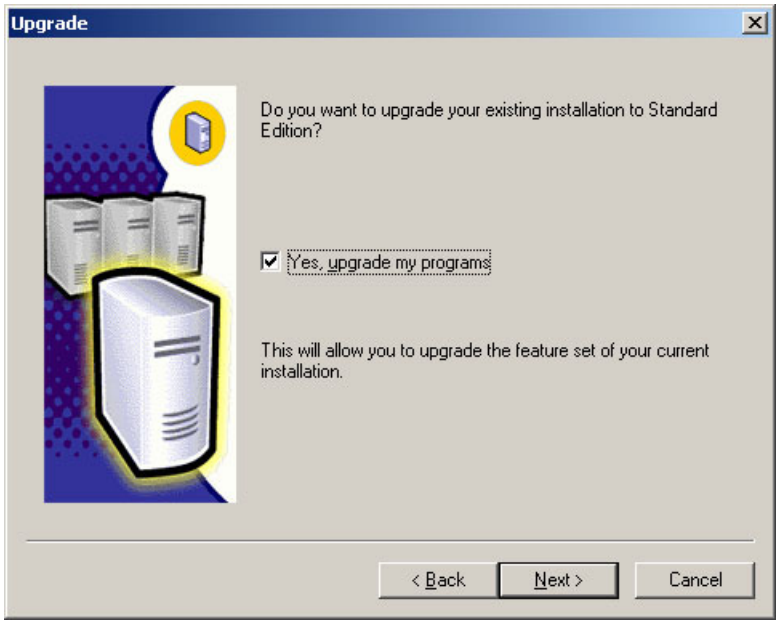


Figure 2-27 Upgrade programs

9. When a message appears prompting you to install additional components, click **Yes**.
10. Figure 2-28 appears. Select **Server Component** then add a check to the left of **Full-Text Search**. If this is the first instance of SQL Server that you are installing, we recommend that you also select the **Management Tools** component. Additionally, to get SQL Server documentation, you must select the **Books Online** component.

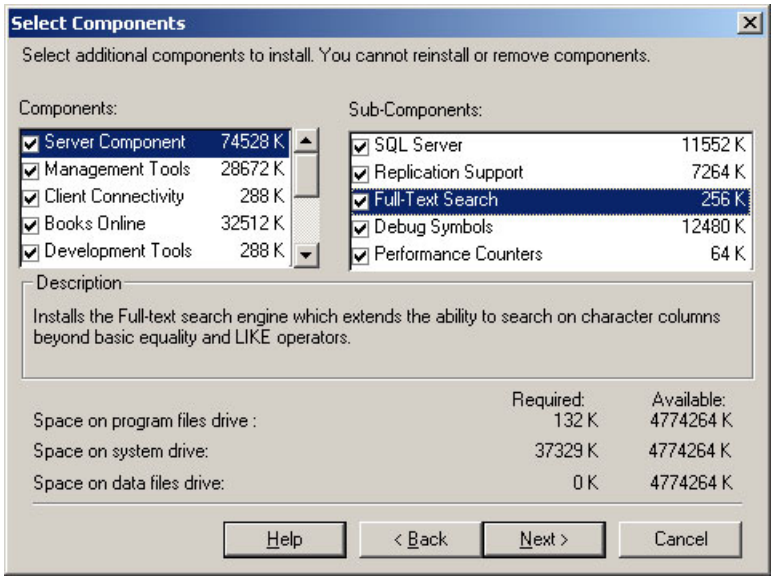


Figure 2-28 Selecting additional components

11. In the Start Copying Files window, click **Next** to begin installing SQL Server.
12. In the Setup Complete window, click **Finish**.

You must now continue to the next procedure to apply SQL Server SP3a to the instance of SQL Server that you just installed.

Installing Service Pack 3a for the SharePoint instance of SQL Server

Tip: There are two instances of SQL Server installed and they both have to be patched with Service Pack 3a. The first was discussed in “Installing SQL Server 2000 Service Pack 3a” on page 35.

To install SP3a to the SharePoint instance of SQL Server follow these steps:

1. From the autorun window of the Premium Technologies disk (Setup.exe), click **Install SQL Server 2000 Service Pack 3a**.

   If you receive a message that the Scm.exe file is in use, restart your server, and then restart SP3a installation.
2. In the Welcome window, click **Next**.
3. In the Software License Agreement window, review the licensing agreement. To continue, you must accept the agreement.
4. In the Instance Name window, clear the Default check box if it is selected. In the Instance name box, select SHAREPOINT.

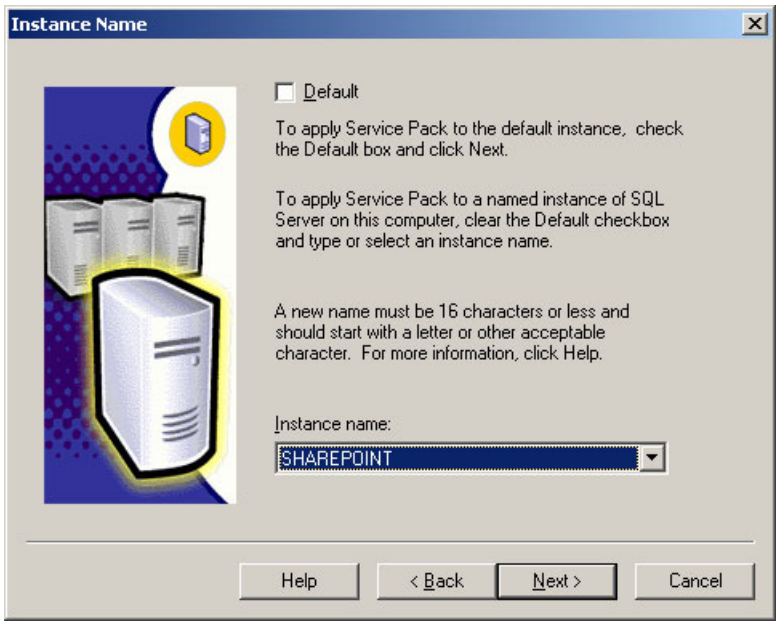


Figure 2-29 Selecting the SharePoint as the instance name

5. In the Connect to Server window, accept the default of **The Windows account name I use to log on to my computer with (Windows authentication)** unless you specified a different authentication mode in the previous procedure.
6. Review the Backward Compatibility Checklist message. If you must modify the SP3a security enhancements, select the appropriate options. For details about each option, click **Help**. Click **Continue** after you have reviewed the security enhancements.
7. When the Error Reporting message appears, you can select **Automatically send fatal error reports to Microsoft**.
8. In the Start Copy Files window, click **Next**.

9. When a message appears prompting you to back up your databases, click **OK**. We highly recommend that you complete a backup after installing Premium Technologies.
10. In the Setup Complete window, click **Finish**.
11. Open SQL Server Enterprise Manager as shown in Figure 2-30 (click **Start** → **All Programs** → **Microsoft SQL Server** → **Enterprise Manager**). Register the SHAREPOINT instance of SQL Server. To do so, double-click **Microsoft SQL Server**, right-click **SQL Server Group**, and then click **New SQL Server Registration**. You must enter the server name as Servername\SHAREPOINT. For the authentication mode, use Windows Authentication.

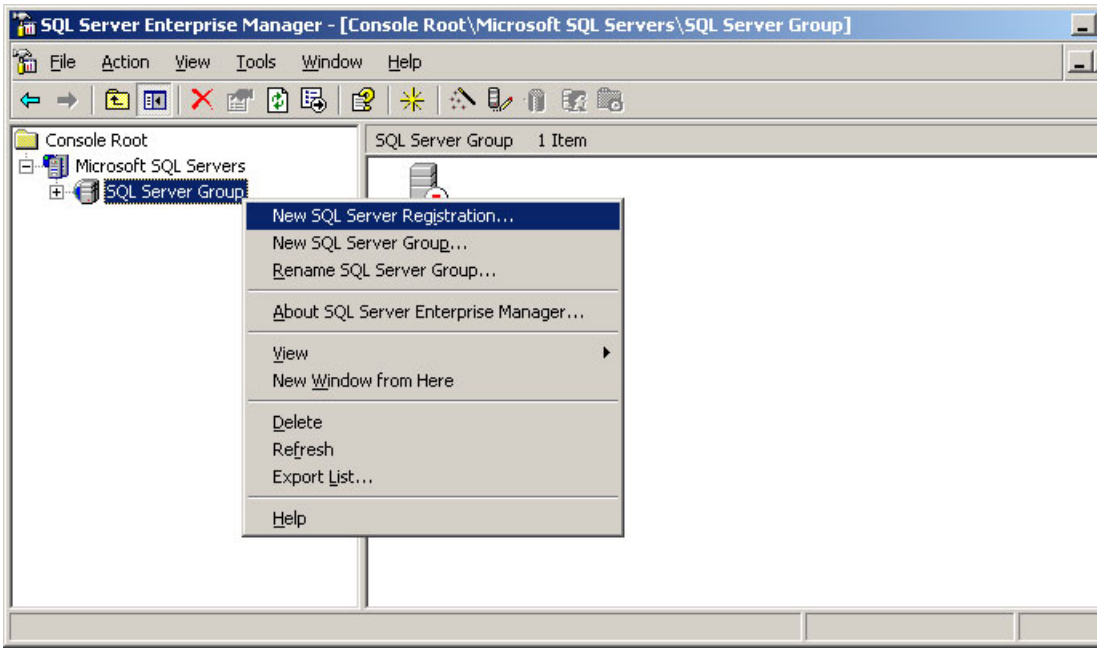


Figure 2-30 Registering the SharePoint instance of SQL Server

If you encounter an error while trying to upgrade the instance of SHAREPOINT, ensure that the MSSQL$SHAREPOINT service is stopped. To do so, click **Start** → **Run** and enter **`services.msc`**. If the service is not stopped, right-click the service name, and then click **Stop**. After the upgrade is complete, you must ensure that the service restarts.

MSDE SP3a is now applied to the instances of MSDE that you installed during the Windows Small Business Server 2003 Setup.

Installing ISA Server 2000

You can install ISA Server 2000 as your firewall. Doing so requires that your server have at least two network adapters, one to connect to the Internet and one to connect to the local network.

To install ISA Server 2000, do the following:

1. From the autorun window of the Premium Technologies disk (Setup.exe on the CD-ROM), click **Install Microsoft Internet Security and Acceleration (ISA) Server 2000**.
2. In the Welcome window, click **Continue**.
3. When the message with your license ID appears, click **OK**.
4. When the End User License Agreement (EULA) page appears, review the licensing agreement. To continue, you must accept the agreement.

5. In the Setup window, select **Typical Installation**.
6. When prompted for the server mode, accept the default of Integrated mode.
7. When a message stating that Internet Information Services (IIS) needs to be reconfigured to use a port other than 80 appears, click **OK**. When you complete the Configure E-mail and Internet Connection Wizard later in the installation, IIS is automatically configured to work with ISA Server.
8. When prompted for where the cache should be located, accept the default drive and cache size.
9. When prompted for the IP addresses that span the internal network address space, click **Construct Table**. The Local Address Table dialog box appears. For **Add address ranges based on the Windows 2000 Routing Table,** ensure that the network card for the local network is selected.

   To determine the network card used by the local network, click **Start** → **Control Panel**, then right-click **Network Connections**, and click **Open**. A list of the type of network card that the Server Local Area Connection uses appears. To see the IP address, double-click the connection, and then click the **Support** tab.
10. When the Launch ISA Management Tool message appears, click **OK**. Do *not* select the Start the ISA Server Getting Started wizard check box.
11. After ISA Server Setup is completed, the Configure E-mail and Internet Connection Wizard appears. You must complete the wizard to properly configure your server to use ISA Server as your firewall. Reconnect your server to your Internet connection device and then click **Next** to begin.
12. In the Connection Type window, even if you have previously run the wizard, you must select your connection type, and then continue through the wizard to the Firewall page.
13. In the Firewall window, even if you have previously run the wizard, you must select **Enable Firewall**.
14. In the Services Configuration window, select those services that you want to allow through the firewall. If you previously ran the wizard and defined custom services, you can open ICWdetails.htm from \Program Files\Microsoft Windows Small Business Server\Networking\ICW. Search for the section “Enable Basic Firewall and Remote Access” to see the list of firewall settings that were configured.
15. In the Web Service Configuration window, select services that you want to allow through the firewall.
16. If you allowed access to Web services, the Web Server Certificate page appears.

    If you have not previously run the wizard, select the type of certificate that you want to use. If you have previously run the wizard, and you chose to use a certificate from a trusted authority, select **Do not change current Web server certificate**. After completing the wizard, you must specify the certificate by using ISA Management, as follows:

    a. Click **Start** → **All Programs** → **Microsoft ISA Server** → **ISA Management**.

    b. Double-click **Servers and Arrays**, right-click your server, and then click **Properties**.

    c. Click the **Incoming Web Requests** tab.

    d. Under Configure listeners individually per IP address, select your trusted certificate, and then click **Edit**. The Add/Edit Listeners dialog box appears.

    e. Ensure that the **Use a server certificate to authenticate to Web clients** check box is selected, and then click **Select**. The Select Certificate dialog box appears.

f. Select the trusted certificate, and then click **OK**. When prompted to save the changes, click **Save the changes and restart the service(s)**.

> **Note:** Do not select the publishing.yourdomain.local certificate.

17. On the Internet E-mail page, if you previously ran the wizard, select **Do not change Internet e-mail configuration**, and then complete the wizard.

> **Tip:** This version of ISA Server 2000 includes ISA Server 2000 Service Pack 1 and hotfixes 177, 255, 256, 257, 265, and 277.

You next install Microsoft Firewall Client on each client computer.

Installing Firewall Client

After you install ISA Server 2000, you must install Firewall Client on each client computer in order to access the Internet.

To install Firewall Client, we recommend that you create a shared folder for the Firewall Client installation files, and then follow these instructions to use the Set Up Client Applications Wizard to deploy Firewall Client to each client computer.

After you install all Premium Technologies on your server, create a full backup.

Copy the installation files to C:\Program Files\Microsoft ISA Server\Clients and share this folder to all clients.

To configure permissions for the shared folder, do the following on the server:

1. Using Windows Explorer, browse to C:\Program Files\Microsoft ISA Server\Clients.
2. Right-click the **Clients** shared folder and click **Share**. The share properties dialog box appears.
3. Share the folder as Mspclnt. Click **Apply**.
4. Click the **Security** tab, click **Add**, and then type Domain Users. Click **Apply** to accept the default permissions assigned.

To add Firewall Client for deployment to client computers, do the following on the server:

1. Click **Start** → **Server Management**.
2. In the console tree, double-click **Client Computers**, and then in the details pane, click **Set Up Client Applications** to launch the Set Up Client Applications wizard.
3. On the Available applications page, click **Add**. The Application Information dialog box appears.
4. In the Application Name box, type `Firewall Client`, and then type or browse to `\\Servername\Mspclnt\Setup.exe`.
5. Follow the instructions to complete the wizard.
6. When prompted to assign the new application to client computers, click **Yes**.
7. When the Assign Applications Wizard appears, follow the instructions to complete the wizard.

Note: The Set Up Client Applications Wizard only works with client computers that are running Windows 2000 Professional and Windows XP Professional. If you have a client computer running a different operating system, you must connect to the share manually from the client computer. At each client computer, click **Start** → **Run**, and enter the following command:

```
\\Servername\Mspclnt\Setup.exe
```

To check the name of your server, click **Start**, right-click **My Computer**, and then click **Properties**. In the Computer Name tab, the name of your server is the first label before the period listed in the Full computer name, for example, *servername*.smallbusiness.local. Alternatively, you can enter **`hostname`** at a command prompt.

Deploying Firewall Client to the client computer

To deploy Firewall Client to the client computer, follow these steps:

1. Have the users log off and then log back on to the client computers.
2. A shortcut to install Firewall Client appears on the desktop. Double-click the shortcut, and then complete the Firewall Client Wizard. Firewall Client is configured automatically to connect to the ISA Server on the computer running Windows Small Business Server.

Important: After completing Setup for the Premium Technologies, we highly recommend that you complete a backup of your server. To do so, use the Backup Configuration Wizard (click **Start** → **Server Management** → **Backup**).

2.2.5 Step 5: Completing the To Do List

When you log on for the first time to a newly installed server running SBS 2003, the first thing you see is the To Do list, shown in Figure 2-31 on page 47. This is a list of tasks that you need to perform to complete the configuration of your server and client computers. You start easy-to-use wizards for connecting the server to the internet, configuring users, and creating computer accounts by clicking on the corresponding entry.

Note: Although all the tasks listed here could also be done using the standard SBS 2003 tools (such as Microsoft Management Console), we recommend that you use the To Do List, because the To Do List performs the configuration of the base operating system and server applications in an integrated manner.

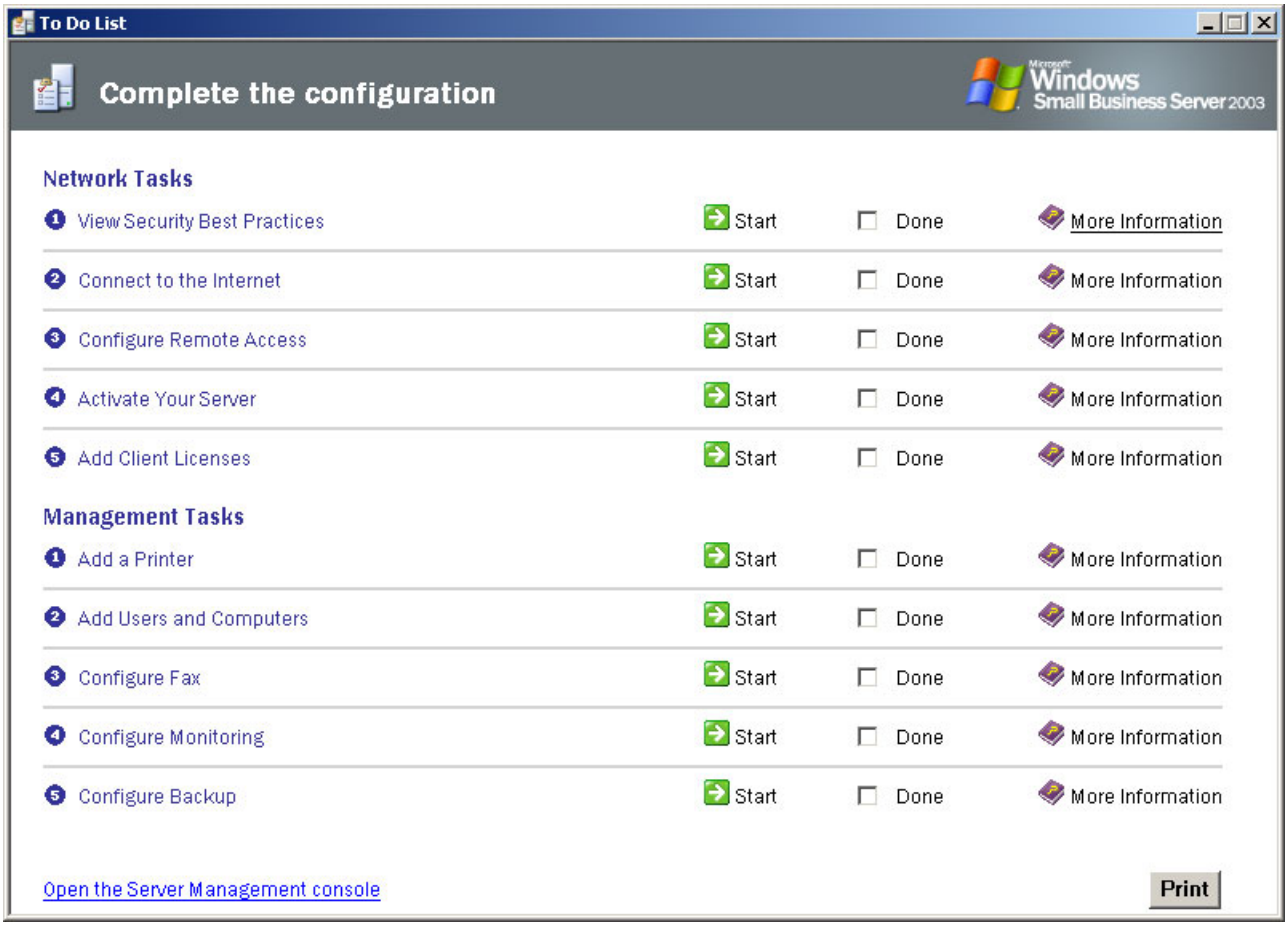


Figure 2-31 To Do List

To finish the installation, complete the tasks on the To Do List. We recommend that you complete the tasks in the order that they appear in the list. Click **Start** to begin a task, click the check box beside **Done** to track which tasks you have completed, and click **More Information** to learn more about the task.

- Network Tasks
  - View Security Best Practices: We recommend that you read through and complete security best practices to help you secure the network. Clicking this task displays a list of security best practices.
  - Connect to the Internet: You must complete this task to ensure that the Internet connection is properly configured for the small business network. Clicking this task starts the Configure E-mail and Internet Connection Wizard. Follow the instructions to configure the server's network, firewall, secure Web site, and e-mail settings.
  - Configure Remote Access: Complete this task if you want to allow remote client computers to connect to the local network through VPN connections, dial-in connections, or both. Clicking this task starts the Remote Access Wizard.
  - Activate the Server: You must activate the server. Clicking this task starts the Windows Product Activation wizard. Follow the instructions to activate the server.
  - Add Client Licenses: If there are more than five client computers, you must complete this To Do List task to add any additional client licenses the customer purchased. This task requires that you first activate the server. Clicking this task starts the Add License Wizard.

- Management Tasks
  - Add a Printer: Complete this task to install a printer. Clicking this task starts the Add Printer Wizard.
  - Add Users and Computers: You must complete this task to configure user accounts and client computer settings. Clicking this task starts the Add User Wizard. After you provide user account information, the Set Up Computer Wizard allows you to configure a client computer for new users.
  - Configure Fax: If the configuration includes a fax modem, complete this task to configure Fax Service for sending and receiving faxes. Clicking this task starts the Fax Configuration Wizard.
  - Configure Monitoring: Complete this task to set up alert notifications and server performance and usage reports for the server. Clicking this task starts the Monitoring Configuration Wizard.
  - Configure Backup: Complete this task to configure server backup. Clicking this task starts the Windows Small Business Server Backup Configuration Wizard. Third-party software is not required.

2.3 Upgrading from Windows Small Business Server 2000

In this section, we describe in-place upgrade on the same server hardware currently running SBS 2000. When you upgrade from SBS 2000 to SBS 2003, the setup program guides you through the following steps:

1. Upgrading the operating system.
2. Configuring the operating system based on the needs of your small business.
3. Upgrading server tools and application.
4. Completing the To Do List tasks, which appear at the end of setup.

Setup provides default values that are typical for a small business. We recommend that you accept these values. However, if you want to change a default value, click **More Information**.

2.3.1 Before you begin the upgrade

Complete the following steps before you begin the upgrade from Windows Small Business Server 2000.

1. Ensure you have installed Windows Small Business Server 2000 SP1.

   To verify if your server is running the service pack, click **Start** → **Small Business Server Administrator Console**. In the console pane, click **Server Status (BackOffice Home)**. In the details pane, click **About**. The version information should report Windows Small Business Server 2000 with Service Pack 1.

2. Check the hardware requirements (as shown in Table 1-3 on page 15) to ensure that your computer meets at least the minimum requirements. Remember that using the recommended hardware improves system performance.

3. Prepare your hard disk by running Disk Cleanup and Disk Defragmenter.

   a. To run Disk Cleanup, click **Start** → **Run**, and enter `cleanmgr.exe`.
   b. To run Disk Defragmenter, click **Start** → **Run**, and enter `dfrg.msc`.

4. Ensure that your hard disk has at least 2 GB of free space. The setup program temporarily uses this space.

5. Verify that your computer hardware and existing applications are compatible with SBS 2003. To do this, see the Windows Server Catalog at:

   http://go.microsoft.com/fwlink/?LinkId=4303

   Important: Ensure that you have the most up-to-date drivers for your hardware devices and the latest system BIOS by downloading the latest from:

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

6. Determine if you need to collect new information for connecting to the Internet. To do so, complete the section "Required Information for Connecting to the Internet" in Appendix A of the *Getting Started Guide*, a booklet which is included with the SBS 2003 product. Then, you will be ready to run the Configure E-mail and Internet Connection Wizard at the end of Setup. Although your existing Internet connection settings are preserved during the upgrade process, there may be new information that you need to collect.
7. The day or evening prior to beginning the upgrade, we recommend that you complete a virus scan of all drives and files.

   Attention: Do not scan the Exchange M: drive because this can lead to corruption of the Exchange database. Instead, we recommend that you use an antivirus solution that enables for scanning the Exchange folders in a nondisruptive way.

8. Perform a full system backup, including the System State data and Exchange.

   Verify that the backup ran successfully, and then test the integrity of the backup. To test your backup, select random files from the backup, restore them to an alternate location, and then confirm that the files are the same.
9. If you are beginning the upgrade while users are still working in the network, have users log off from the domain.

   We recommend that you notify users that they need to log off in a short while and that they will lose their Internet connection. You can quickly notify all users by using the **net send** command. At a command prompt, enter the following command (all on one line):

   ```
   net send * You must log off from the domain within 5 minutes. At that point,
   the Internet will also be unavailable.
   ```

   Wait the specified amount of time, and then continue.
10. Stop services for any third-party applications that are running on the server using the Local System account. If a third-party application is running using the Local System account, it may have a file lock on operating system files. This prevents Setup from upgrading your operating system.

    To determine if an application is running as the Local System account, open Services (click **Start** → **Run**, and enter `services.msc`) and check for third-party services that have Log On As set to Local System account. If there are third-party services using the account, stop the service, record the setting for Startup Type, and then set Startup Type to Disabled.
11. Unless your Internet connection device provides a firewall service for your local network, we recommend that you disconnect your Internet connection device from the Internet.

    Important: When disconnecting your Internet connection device from the Internet, make sure the server stays connected, because the SBS 2003 setup procedure checks the network link on the server's network interface.

12. Turn off or disable any disk utilities that may be running, such as real-time antivirus monitoring software or backup software that use open file agents. Disk utilities can cause problems while running Setup.

2.3.2 Step 1: Installing Windows

To complete an upgrade to Windows Small Business Server 2003, the setup program first upgrades the operating system. If your computer has a DVD drive, use the DVD media. Otherwise, use the CD media.

Important: After you install the operating system, do not customize your server until you have completed the To Do List, which appears as the last part of completing setup.

1. Log on to the computer using the built-in Administrator account.
2. Insert Windows Small Business Server 2003 disk 1 or the DVD into the CD-ROM or DVD drive. When the autorun window appears, click **Set Up Windows Small Business Server**.

   If it does not appear, click **Start** → **Run**, and then type `D :\Setup.exe`, where D: is the letter of your CD-ROM drive. If you are using the DVD, type `D :\CD1\Setup.exe`, where D is the letter of your DVD drive.
3. In the Welcome to Microsoft Windows Small Business Server window, click **Next**.
4. The Upgrade Information page lists the tasks in 2.3.1, “Before you begin the upgrade” on page 48. If you have completed these tasks, click **Next**.
5. The Setup Requirements page appears, which lists requirements for installation, warning messages, or informational messages. To continue Setup, you must resolve all requirements for installation. If there is a warning message, you must either fix the issue or select the I acknowledge all warnings check box.

   If resolving a condition requires you to restart your computer, you must restart Setup. Click **Next** to continue.
6. In the License Agreement window, read the agreement, and then click **I agree** to continue.
7. In the Product Key Information window, type your license key.
8. In the Required Components window, click **Next** to begin the upgrade of your operating system.
9. The Component Progress window appears, listing the progress of the operating system upgrade. During the upgrade of your operating system, the computer restarts several times.
10. When the Windows Logon window appears, the operating system upgrade is complete. Continue with Step 2: Configuring Windows.

2.3.3 Step 2: Configuring Windows

You next configure the upgraded operating system in preparation for upgrading applications and tools. To do this you:

1. Log on to the computer using the built-in Administrator account.
2. In the Continuing Microsoft Windows Small Business Server Setup window, click **Next**.
3. In the Company Information window, verify company information.
4. The Logon Information window appears. We recommend that you click **Log on automatically**, and then type the password for the account with which you are currently

logged on. When you select this option, the setup program continues to install components each time the computer restarts. The program temporarily stores your password until it is complete or you cancel it.

5. In the Windows Configuration window, click **Next** to install components that must be installed or configured before the setup program can continue. The installation takes several minutes.
6. The Component Progress window appears, listing the progress of component installation and configuration. If the computer must be restarted and you chose to log on automatically, the setup program continues without your needing to log on. Otherwise, you must log on using the built-in Administrator account after the computer restarts.
7. When the Component Selection window appears, continue to “Step 3: Installing server applications” on page 51.

2.3.4 Step 3: Installing server applications

After you configure the operating system, the setup program upgrades the Windows Small Business Server tools and applications. Take the following action in the Component Selection window:

1. In the Data Folders window, select a different location for intranet files. Additionally, if you selected to install an application that was not installed on Windows Small Business Server 2000 and the application requires a data folder, you must specify the location for data at this point.
2. In the Component Summary window, verify the installation actions for the list of components.
3. The Component Progress window appears, providing status on the installation. For components that require the computer to restart, the setup program continues if you selected to log on automatically.

   If you are using the CDs for installation, the program will prompt you to insert a new CD. If you are using the DVD, no user interaction is typically required during this phase.

   If there are errors or messages related to a component you selected to install, the Component Messages window appears. Review the errors or messages.
4. On the Finishing Your Installation page, click **Finish**, and then click **OK** to restart your computer. To complete the upgrade, continue to “Step 4: Completing the To Do List” on page 51.

2.3.5 Step 4: Completing the To Do List

To finish your installation, complete the tasks on the To Do List. We recommended that you complete the tasks in the order that they appear in the list.

1. Click **Start** to begin a task.
2. Click the check box beside **Done** to track which tasks you have completed.
3. Click **More Information** to learn more about the task.

This to-do list is similar but not identical to the one shown in Figure 2-31 on page 47.

The network tasks are as follows:

- View Security Best Practices

  We recommended that you read through and complete security best practices to help you secure your network. Clicking this task displays a list of security best practices.

- Connect to the Internet

  Clicking this task starts the Configure E-mail and Internet Connection Wizard. Although your Internet connection settings were preserved during the upgrade process, the Configure E-mail and Internet Connection Wizard has new functionality that was not included in the SBS 2000 Internet Connection Wizard. It is recommended that you complete this task to properly configure network, firewall, secure Web site, and e-mail settings for SBS 2003.

  At the end of the wizard, you are prompted to configure password policies. If you allow access to the server from the Internet, we highly recommend that you enforce strong user passwords. Strong passwords provide an additional layer of protection against an unauthorized user gaining access to your network. The requirement for strong passwords does not take effect for three days, which helps to simplify the process of setting up user accounts and client computers.

  Important: If you disabled the real-time antivirus software when you started the setup program, enable it again before connecting to the Internet.

  Before completing this task, you must reconnect the Internet connection device to the Internet. For details, click **More Information** next to the Connect to the Internet task on the To Do List.

- Configure Remote Access

  Complete this task if you want to allow remote client computers to connect to your local network through VPN connections, dial-in connections, or both. Clicking this task starts the Remote Access Wizard.

  Important: If users currently have permission to access the local network remotely, you must assign users to the Mobile Users security group for them to continue to have the necessary permissions. To do so, complete the Migrate Users task on the To Do List.

  You can also deploy the Connection Manager configuration package, which configures the settings necessary for connecting mobile and remote client computers to the local network. To do so, complete the Add Users and Computers task on the To Do List.

- Activate Your Server

  You must activate your server. Clicking this task starts the Windows Product Activation wizard. Follow the instructions to activate your server.

- Add Client Licenses

  If you have more than five client computers, you must add upgrade client licenses for Windows Small Business Server 2003. This task requires that you first activate your server. Clicking this task starts the Add License Wizard.

- Import Files

  Complete this task to import files from your server or shared folders in the network to Document Libraries in Windows SharePoint Services. Clicking this task starts the Import Files Wizard.

The management tasks are as follows:

- Migrate Users

  Complete this task to update user accounts from the templates used in SBS 2000 to the templates used in SBS 2003. Clicking this task starts the Change User Permissions Wizard.

  Important: If you do not complete this task, some features may not be available to your users.

  If users currently have permission to access the local network remotely, you must assign users to the Mobile Users security group for them to continue to have the necessary permissions. To do so, complete the Migrate Users task.

- Upgrade Client Computers

  Complete this task to update existing client computers for the settings necessary for SBS 2003. Clicking this task starts the Set Up Computer Wizard.

  Important: If you do not complete this task, some features may not be available to users.

- Configure Fax

  If you have a fax modem, complete this task to configure Fax Service for sending and receiving faxes. Clicking this task starts the Fax Configuration Wizard.

- Configure Monitoring

  Complete this task to set up alert notifications and server performance and usage reports for your server. Clicking this task starts the Monitoring Configuration Wizard.

- Configure Backup

  Complete this task to configure server backup. Clicking this task starts the Windows Small Business Server Backup Configuration Wizard. Third-party software is not required.

You have completed the upgrade. To begin managing SBS 2003 or to open the new administrator console, click **Open Server Management** on the To Do List.

Important: If you disabled any third-party services as described in “Before you begin the upgrade” on page 48, you must change the Startup Type back to the original setting, and then start the service. To do so, open Services (click **Start** → **Run**, and enter `services.msc`).

3

Windows Small Business Server 2003 on xSeries servers

The IBM @server family of servers meets a broad range of customer requirements, from the server computing needs of the world's largest corporations to the needs of millions of smaller businesses striving to succeed. Each brand within the IBM @server family provides different strengths, capabilities, and architectures.

The IBM @server xSeries brand provides Intel processor-based, highly reliable, industry standard servers. The entry-level xSeries servers are ideal platforms for SBS 2003 because they leverage the rich server technology heritage of performance and reliability at an affordable price.

IBM currently offers several xSeries models with SBS 2003 preinstalled at the factory. These models are the xSeries 206, 226, and 236. Each model offers slightly different feature and function characteristics enabling them to meet the requirements of most small business customers.

3.1 xSeries models

IBM has created a series of server offerings designed for small business. These offerings are constructed as a foundation to run business applications and come with all the standard server components to run the server solution efficiently.

These servers are tower models preloaded with Windows Small Business Server 2003, Standard Edition.

3.1.1 xSeries 206

The entry level single-processor xSeries 206 server is optimized for small businesses and distributed environments. Easily accessible toolless chassis makes it easier to deploy this server in small companies lacking trained IT staff. Added features such as new simple-swap SATA hard disk drives and integrated IBM ServeRAID 7e helps customers lower IT costs and manage their business. The main features of this server are:

- Tower standalone case (optional rack capability using a rack conversion kit)
- Intel Pentium 4 processor with 800 MHz front-side bus speed
- 4 GB maximum PC2700 or PC3200 ECC DDR memory
- Choice of up to four fixed SCSI disks (up to 587.2 GB), three hot-swap SCSI (up to 440 GB), or three simple-swap SATA (up to 320 GB)
- Integrated 10/100/1000 Ethernet controller
- Two PCI-X and three PCI slots
- Alert Standard Format 2.0, which provides secure remote power-on and off support for remote clients, even in an OS-absent state
- Integrated ServeRAID 7e controller, which allows RAID 0 or RAID 1 disk configurations without having to purchase hardware adapters

Figure 3-1 xSeries 206

3.1.2 xSeries 226

The xSeries 226 offers affordable two-way processor performance with Intel Extended Memory 64T, increased availability with integrated RAID 0 or 1 and a choice of hot-swap SCSI or simple-swap SATA drives, and innovative management features such as Alert Standard Format 2.0. Features of this server include:

- Tower case with 4U rack capability (via optional rack-mount kit)
- Up to two Intel Xeon Processors with 800 MHz front-side bus speed supports Intel Extended Memory 64 Technology (EM64T) for investment protection
- 512 MB standard/16 GB maximum PC2-3200 DDR2 memory
- Standard RAID 0 or 1 through integrated IBM ServeRAID 7e
- Up to six hot-swap Ultra320 SCSI hard disk drives and 880 GB maximum storage (select models) and up to four simple-swap SATA HDDs (with optional RAID adapter)
- Integrated 10/100/1000 Ethernet controller
- Three PCI-X, two PCI and one PCI-Express slots for expandability
- Support on some models for redundant hot-swap power supplies
- IBM Director, Alert Standard Format 2.0, Remote Deployment Manager and optional Remote Supervisor Adapter II for proactive remote management for distributed environments

Figure 3-2 xSeries 226

3.1.3 xSeries 236

The xSeries 236 is a mission-critical, high performance, 2-way server for distributed environments. IBM designed this model for messaging, collaboration, and business server applications. The x236 is scalable in configuration, performance, and availability. Features of this server are:

- Tower case with 5U rack capability (via optional rack-mount kit)
- Up to two Intel Xeon Processors with 800 MHz front-side bus speed supports Intel Extended Memory 64 Technology for investment protection
- 512 MB standard/16 GB maximum PC3200 DDR2 memory (two slots used, six available)
- Optional Advanced memory protection: memory mirroring, on-line hot-spare, and Chipkill™
- Integrated RAID 0, 1, 10, optional RAID 5 via ServeRAID 7k,
- Up to nine hot swap Ultra320 SCSI hard disk drives
- Hot swap redundant power supplies and fans
- Two PCI-Express (one hot-plug), three PCI-X, and one standard PCI slot
- Integrated dual Gigabit Ethernet controller
- Easy troubleshooting via side visible Light Path diagnostic panel
- Integrated Systems Management Processor and option RSA II Slimline management controller (using a dedicated connector) for enhanced predictive failure analysis and server systems management

Figure 3-3 xSeries 236

3.2 New server features and functions

This section describes some of the new features of these xSeries models.

3.2.1 Enhanced Memory 64 Technology, 64-bit extensions

After the success AMD had with their Opteron processor, Intel introduced in June 2004 a compatible CPU code named Nocona. A technology interchange agreement between AMD and Intel enabled Intel to bring their own 64-bit extensions to the IA32 instruction set within a remarkably short time to the market. Enhanced Memory 64 Technology (EM64T) extends the well-established IA32 instruction set with new 64-bit general purpose registers (GPR), 64-bit instruction pointers, and the ability to process data in such 64-bit chunks.

Intel 32-bit processors (those without EM64T) supported a 32-bit flat address space, which means that they could address up to 4 GB without additional paging. With EM64T, the new Xeon DP Nocona processor supports a 36-bit flat address space, which means a maximum addressable memory of 16 GB. Future EM64T processors will support an even larger flat address space.

The primary advantage for server administrators is compatibility of existing 32-bit applications plus the support for future 64-bit operating systems and applications. 64-bit and 32-bit applications will be able to run simultaneously. Compare this to the current Windows 32-bit operating systems that also support the 16-bit applications from the Windows 3.1 era.

Note: Windows Small Business Server 2003 is a 32-bit operating system with 32-bit applications. Therefore, it runs the Xeon DP EM64T processor in *legacy mode* and does not support 64-bit applications nor take advantage of 64-bit addressability.

3.2.2 SATA technology

Parallel SCSI technology can perform at a maximum of bus speed of ATA 133 MBps and a throughput of 320 MBps currently. It cannot, as of yet, reach higher speeds, such as 640 MBps, due to problems such as signal corruption and the necessity of extremely short cable lengths (if the parallel SCSI speed is doubled, the SCSI cable length has to be halved).

These speed limitations accentuate the need for SATA technology and its ability to reach higher throughput speeds. Customers need to move large amounts of data accurately and faster over longer distances. SCSI addressability is also limited to 15 devices. So, there are many advantages to moving from parallel to serial technology.

ServeRAID 7t SATA controller

The ServeRAID 7t SATA controller is a four-port SATA controller for entry-level servers. Each port has a dedicated connector for each SATA hard disk drive attached to the controller (as shown in Figure 3-4 on page 60), because the topology of SATA is point-to-point. All four channels on the ServeRAID 7T SATA controller work independently of each other eliminating contention between drives. So, in this technology, there is no sharing of interface bandwidth or the problems inherent with it.

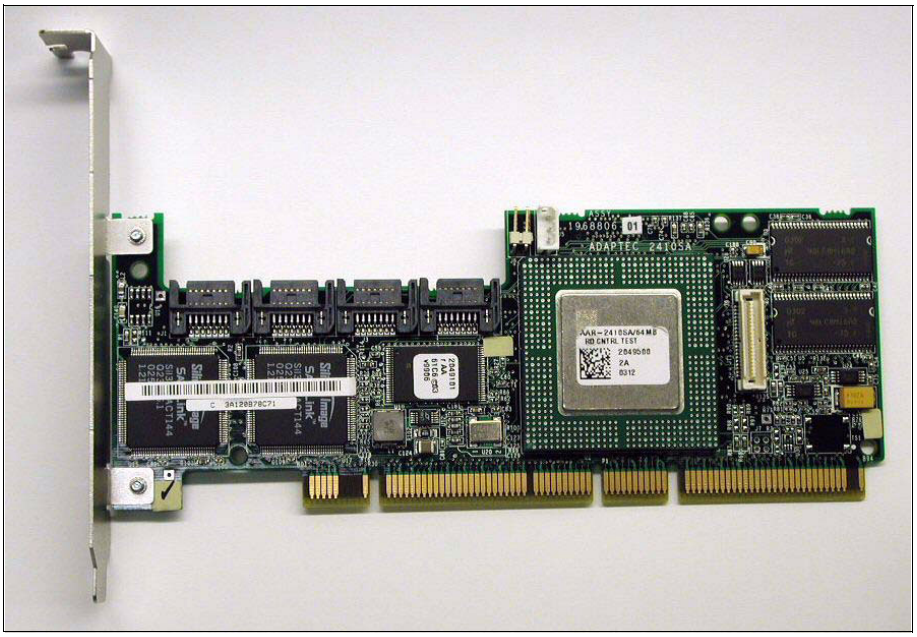


Figure 3-4 IBM ServeRAID 7t SATA controller

Controller's main features are:

- 64 bit/66 MHz universal PCI adapter
- MD2 card design (low-profile) with notch for installation in 3U server systems
- Up to four physical drives supported per controller
- Up to 150 MBps data throughput on each SATA port
- Support for RAID levels 0, 1, 5, 10, or simple disks
- Support for stripe unit sizes of 16 KB, 32 KB, or 64 KB
- One logical drive per array
- 64 MB SDRAM write-back cache (fixed)
- Uses Intel 80302 I/O processor running on 400 MHz
- SMART enabled
- Management through the ServeRAID Manager software

SATA connectors

The connectors for SATA are designed to reduce the problem of crosstalk, which was a large issue with parallel ATA connectors. The cables for SATA technology are thinner and more flexible than those for Parallel ATA technology, as shown in Figure 3-5 on page 61.

This design makes them easier to route and helps maintain better airflow within the server. Fewer pins also enable lower cost connections which helps lowering total manufacturing costs.

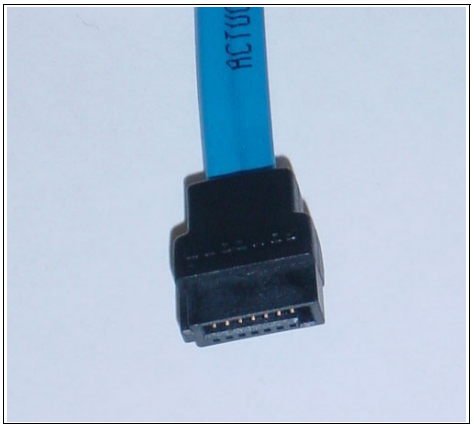


Figure 3-5 SATA cable and connector

Smaller connectors also enable the ability for smaller server form factors. The smaller connectors reduce space used on the controller. In fact the connectors only take 25% of the space needed for Parallel ATA connectors. This is illustrated in the example of x206 server side SATA connectors on the system board, as shown in Figure 3-6.

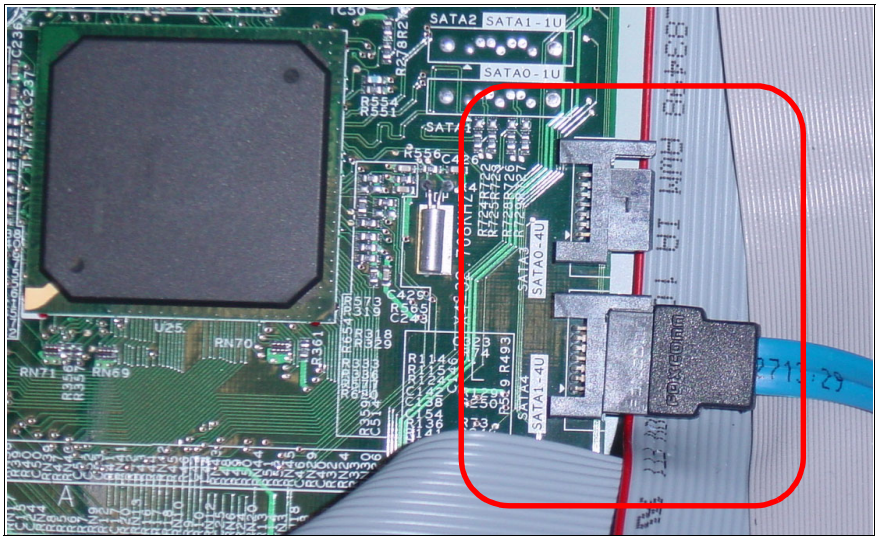


Figure 3-6 System board SATA connectors

3.2.3 Xtended Design Architecture

Industry standard servers have disk drives attached in a way where a replacement of the disk drive means the server has to be shut down, power cables removed, server case opened, drive signal and power cables removed, and only then can the disk be exchanged with another one. And then all the mentioned actions have to be reversed.

In contrast, changing simple-swap SATA drives, as the name implies, is a much easier, and very important, quicker task. Xtended Design Architecture™ means that the drives are accessible from the front of the server, as the Figure 3-7 on page 62 shows. Thus, you do not need to open the side panel of the server. You only remove the front panel, pull on the blue

plastic strip to unlock the drive and slide it out, without disrupting the server operation. There is also the added benefit of IBM server design. You do not need tools for this operation.

Figure 3-7 Front accessible simple-swap SATA drives (x206)

3.3 Adaptec RAID Configuration Utility

The ServeRAID 7e and ServeRAID 7t controllers use an embedded BIOS utility called Adaptec RAID Configuration (ARC) for configuration purposes. The ARC utility is only supported with the ServeRAID SATA controllers.

The x206 and x226 models with an integrated ServeRAID 7e controller have a trimmed-down version of this utility embedded in its BIOS code. This trimmed-down version is limited to RAID 0 and 1 support with a single hot swap drive.

This section describes the utility and offers a how-to guide to create a mirrored disk array before you install Windows Small Business Server 2003.

Tip: See Appendix A, “Disk RAID levels” on page 75 for a discussion of RAID array levels.

1. To start the utility during the boot of the system, press Ctrl+A when prompted.

   The ARC utility for embedded controllers main screen, as shown in Figure 3-8 on page 63, offers two options:

   – Array Configuration Utility
   – Disk Utilities

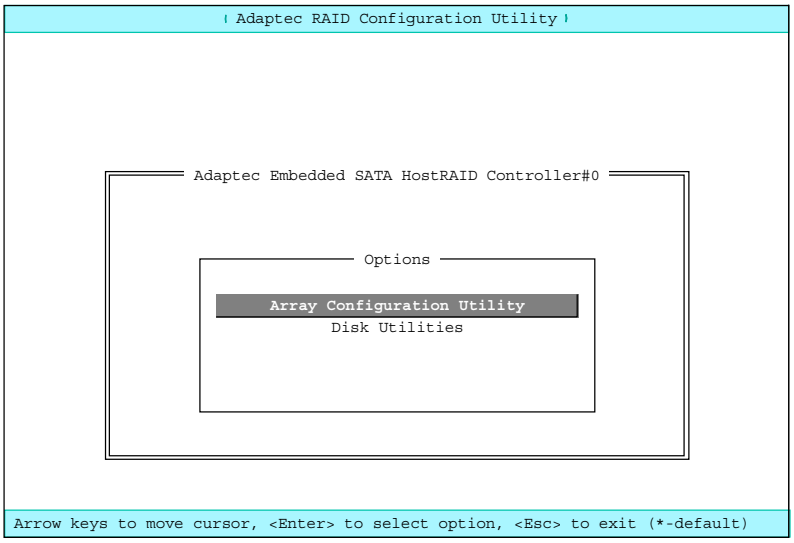


Figure 3-8 Array Configuration Utility

The Main Menu has the following options:

- Manage Arrays
- Create Arrays
- Add/Delete Hotspare
- Initialize Drives

2. To create a new array, select **Create Arrays** and press Enter.

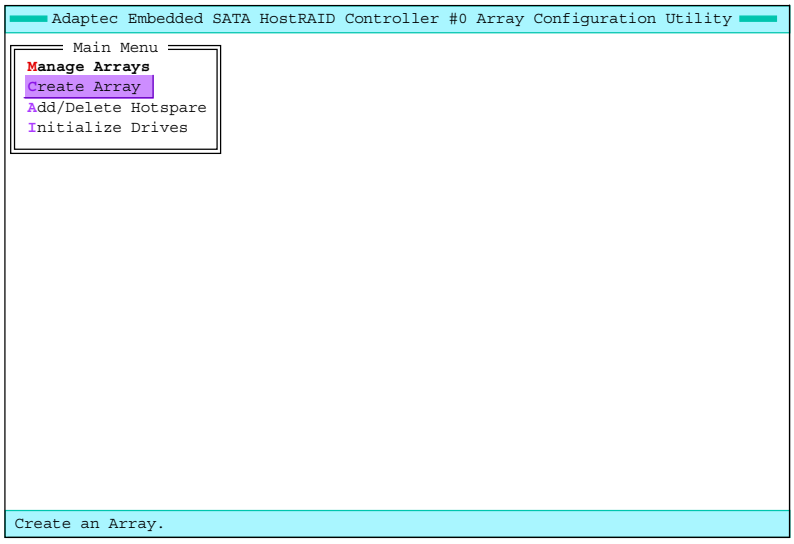


Figure 3-9 ACU Create Array menu

3. A new screen opens that shows the available drives on the left side of the screen. For each drive, highlight it with the arrow keys, then press the Ins key to form the new array. Press Enter when you have selected both drives.

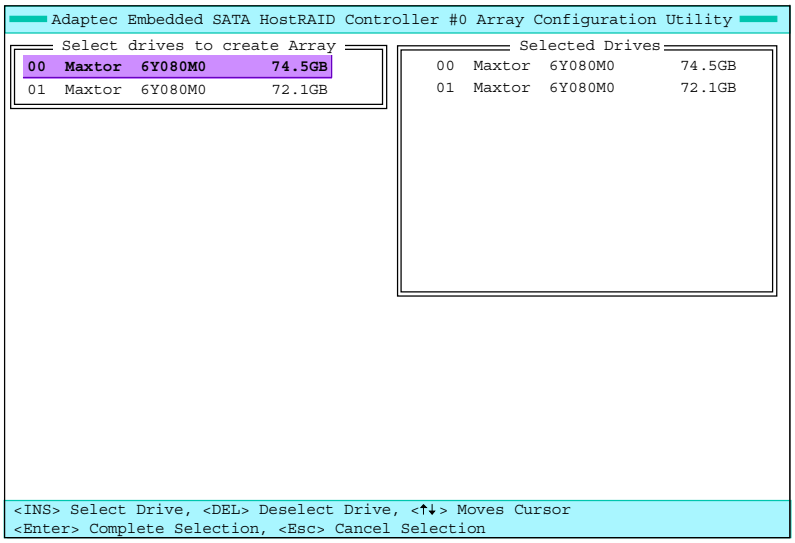


Figure 3-10 Selecting drives to form a new array

4. Now you need to select the RAID level. You can choose between RAID 0 (striping) or RAID 1 (mirroring). See Appendix A, “Disk RAID levels” on page 75 for a discussion of these different RAID levels. By default RAID 1 is selected. The array size is displayed according to your selection.

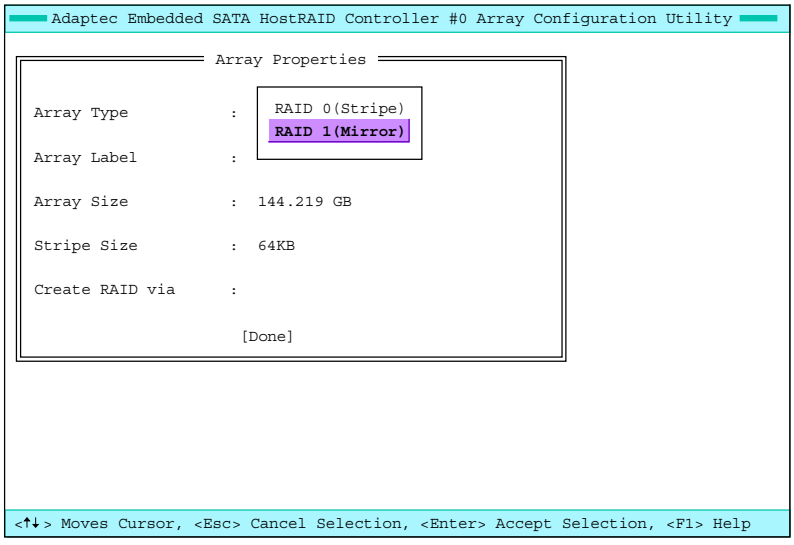


Figure 3-11 RAID level selection

5. You next need to provide a label (name) for this array. For a RAID 0, you can change the stripe unit size. Before the array is formed, you have to choose the creation method. Here are possible options:
   - For creating a RAID 0 array
     - No Init: Creates the array without initialization
     - Migrate: Creates RAID 0 array from a single drive

– For creating a RAID 1 array

  - Quick Init: Creates the array without initialization
  - Clear: Writes zeroes to all the array members (that is, initialize the drive)
  - Build: Copies data from the source to the target drive

Use Build if you are forming an array where one drive already has data you wish to mirror onto the other drive.

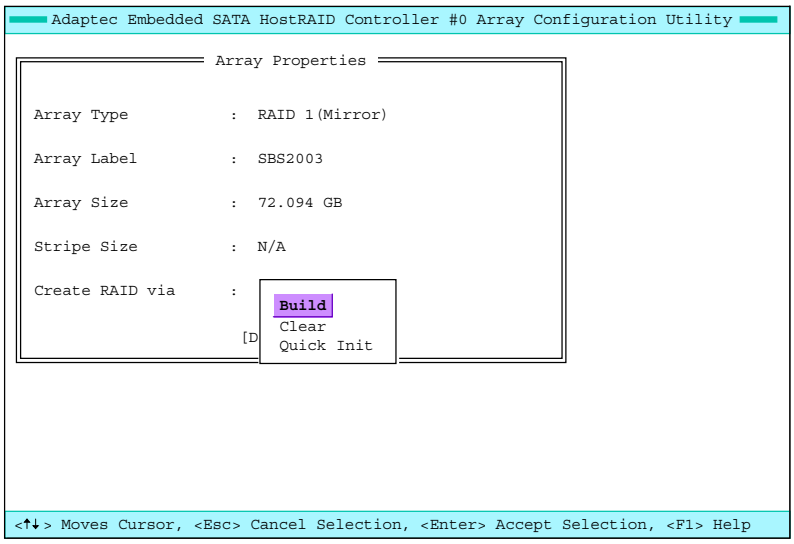


Figure 3-12 Selecting the method to create the array

If you selected No Init (RAID 0) or Quick Init (RAID 1), the array is done instantly. For other options, the procedure could last considerably longer. The result is an array that is ready to start the operating system installation on it.

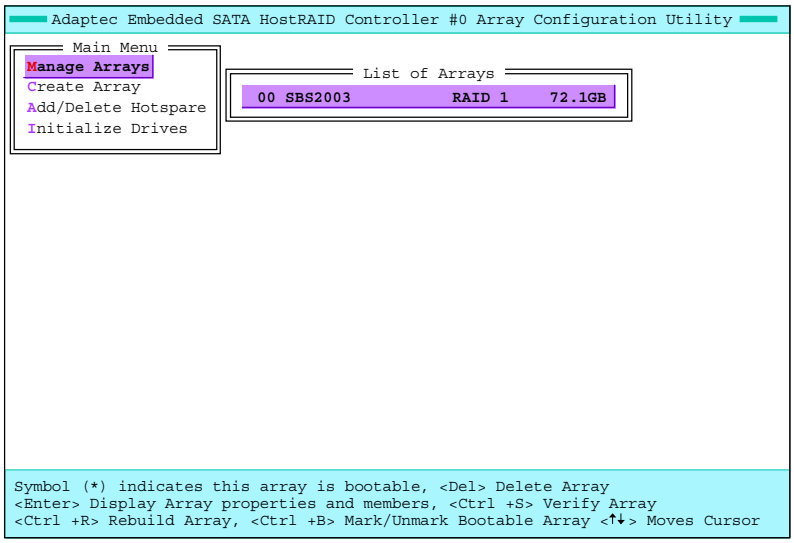


Figure 3-13 Array creation finished

To see the array properties, select **Manage Arrays** in the Main Menu. The existing array is listed. To display the array members and properties (as shown in Figure 3-14), press Enter.

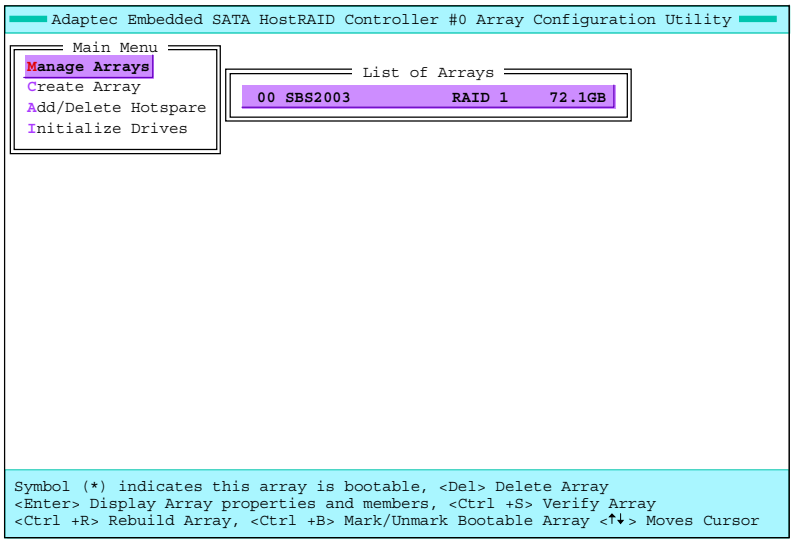


Figure 3-14 ACU Manage Arrays menu

If there have been problems with one or the other drive, you have to repair the array.

To repair a degraded array (such an array is marked as DEGRADED under Array Status), select **Manage Arrays** in the Main Menu and press Ctrl+S to verify it. The status displays as shown in Figure 3-15.

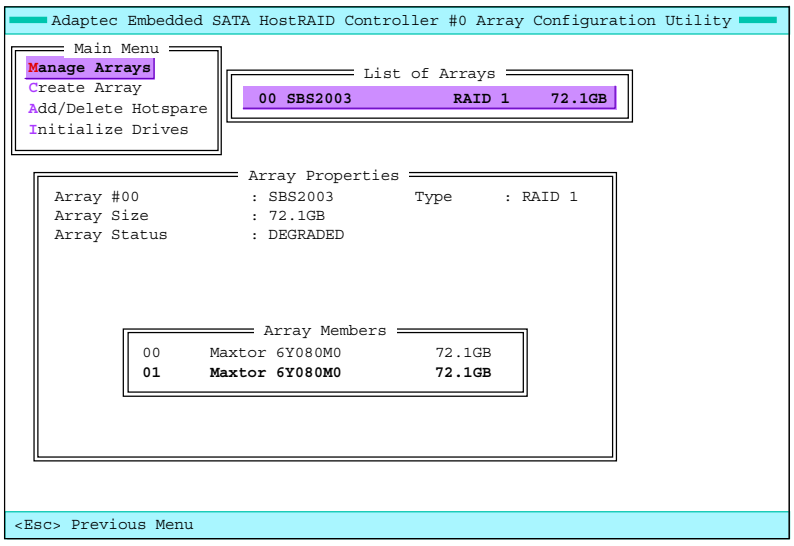


Figure 3-15 Verifying array (Ctrl+S)

If the status stays as DEGRADED, press Ctrl+R from the Manage Arrays menu to rebuild (resynchronize) it. The array members are remirrored, and the progress is shown in a percentage (Figure 3-16 on page 67).

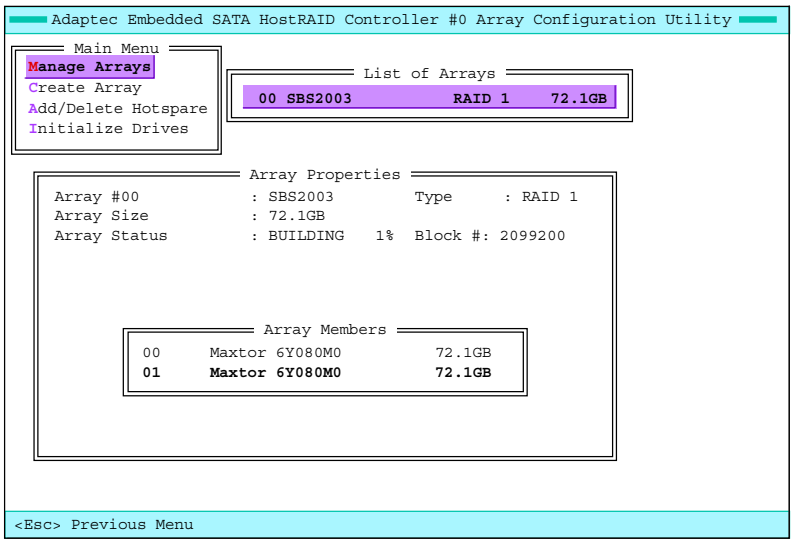


Figure 3-16 Rebuilding array

When the process is finished, the program displays a message as shown in Figure 3-17.

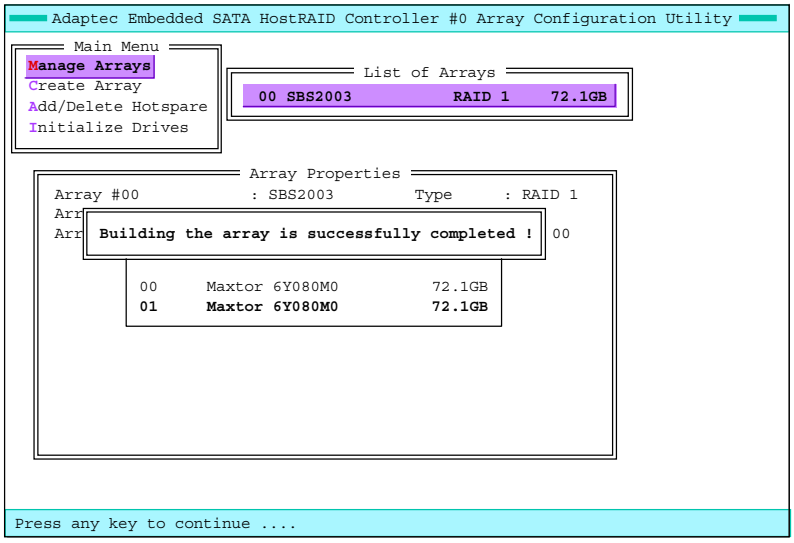


Figure 3-17 Successful rebuild

During the next server boot, status of the array changes to OPTIMAL.

4

Value-added reseller services

Technology consultants and value-added resellers (VARs) provide a significant role to customers with the xSeries offerings. VARs offer a wide variety of services ranging from new server installations, network planning, and application solutions to maintenance services, that effectively focus customers on their business and not on worries about technology.

This chapter introduces some of the typical services that an IT consultant can offer in combination with the IBM offerings.

4.1 New server installations

According to AMI Research, there are more than 41 million small businesses worldwide including approximately 7.6 million in the United States. Their research shows that 91% of these companies in the U.S. have at least one PC and 66% have more than one PC. Interestingly, only 30% of small businesses use a network. Approximately 19% use at least one server, and only 6% use more than one server.

An IT consultant's primary opportunity with Windows Small Business Server 2003 is to focus on delivering a new server to small businesses that have more than one PC but no existing server. Using the above research figures, this equates to more than 3.5 million small businesses in the US (66% have more than one PC minus the 19% that already have a server for a total of 47% of the 7.6 million small businesses in the U.S.).

The IT consultant's role in this project include helping customers plan for, select and install an appropriate server, customizing the server with their company-specific information, and configuring desktops to work with the new server. A typical implementation project for a ten-user company may result in an estimated 10 to 20 hours of services.

Windows Small Business Server 2003 introduces a new opportunity for consultants to save up to 90% of the setup time required by previous versions by purchasing a new server with SBS 2003 pre-installed. IBM is providing this service today via it's preloaded offerings. This offering enables consultants to deliver more value to the customer. When the new server arrives, the consultant simply provides customer-specific information and the server can be ready for use within 15 minutes.

In addition, Windows Small Business Server 2003 may be licensed without purchasing a pre-configured server. You may choose to license the software separately if the hardware you recommend is not available with SBS 2003 pre-installed or if you will be installing on the customer's existing hardware.

4.2 Server upgrades and migration

In addition to new server installations, IT consultants can provide upgrade or migration services to the 19% of small businesses (nearly 1.5 million in the U.S.) that already have one or more servers. This offering may be an upgrade from Small Business Server 4.5 (based on Microsoft Windows NT), Small Business Server 2000 (based on Windows 2000), Windows NT, or Windows 2000. It may also be a migration from a competitive server solution.

In addition to the services discussed in the above, IT consultants may also be responsible for transferring data and security settings to the new server, migrating the existing e-mail services to Microsoft Exchange Server 2003, and re-configuring network settings and user desktops. Consultant's services vary by customer size, existing infrastructure, and available budget. Typical upgrades or migrations from previous Microsoft server solutions may add 5 to 10 hours to the new installation estimate, though more complex environments may require more time.

4.3 Management and support

Small businesses typically do not have trained IT personnel on staff. This situation provides an excellent opportunity to offer management and support services to them. Management tools found in Windows Small Business Server 2003 and additional ones built into xSeries server make it possible to do those tasks remotely and also be notified by the SBS 2003 via

e-mail about the status of the server. By providing ongoing management and support services to Windows Small Business Server customers, IT consultants ensure that customers receives maximum server uptime for a reasonable annual cost.

4.3.1 Remote management

As mentioned previously, xSeries servers included in the IBM offering have additional systems management possibilities like secure remote power-on or off (ASF2.0), complete hardware and software management solution using IBM Director 4.2 (included with servers), or even hardware-based management solution using optional Remote Supervisor Adapter II, which is completely server-independent. RSA II card is an independent computer inside the server with its own communication lines (serial for modem attachment or Ethernet), which can survive catastrophic server failures. IT consultant can connect to the card independently of the server condition and can execute a wide range of actions like remote POST, remote firmware update, remote desktop control, power on and off the server or set thresholds, which when reached can trigger alerts sent out by the card.

4.3.2 Backup and restore

Integrated backup program offers a wide range of possible services an IT consultant could offer. Ranging from a traditional daily backup to a locally attached tape device or a possibility to backup to a disk drive of a local or even a remote machine, which could be located at the consultants business or even a disaster-protected secure location.

4.4 Security setup

Small business owners and employees usually do not have as much training, motivation, or knowledge in IT security as is more prevalent in enterprise environment. It is not uncommon for small business operators (or the person they get to do it for them) to not be aware of the security implications of placing desktops and servers directly connected to the Internet with no protection at all. This direct connection means that their systems could well serve as vectors for new attacks or, if they are compromised, as relay points for attacking other systems on the Internet.

So, what do you tell the small business owner about computer security? The first steps are certainly implementing a firewall, using anti-virus solutions, and developing a method to keep computer systems regularly updated with the latest security patches.

However, there is more. Windows Small Business Server 2003 is an excellent securable business computer solution. It offers all the security values of Windows Server 2003, such as Group Policy, security configuration and analysis, the Group Policy Management Console, shadow copy, Software Restriction policies, and EFS. And it offers more in the form of easy-to-use, straight-forward wizards that can save you a lot of time, as well as remind you to configure security features and use security best practices. The wizards simplify much of the management of a SBS 2003 domain. One such wizard is *Connect to the Internet* as discussed in the next section.

4.4.1 Connect to the Internet Wizard

Connect to the Internet Wizard is one of the best things the product design team has done for SBS 2003. Here's what it can do:

- Configure firewall services

  In the Standard edition, you can configure the RRAS basic firewall to block all access to the Internet, and then open it for those services you select such as Web and e-mail.

- Configure Web Services

  Here you can select what services are accessible from the Internet.

- Support SSL

  The wizard allows you either to import an SSL certificate for use in protecting Outlook Web Access with SSL or create a self-signed SSL certificate. The certificate is then installed and the proper virtual directories set to require SSL. As the Exchange server should only be accessed by employees, using a self-signed certificate is acceptable. Later, when configuring clients, the client configuration wizard will install a copy of a certificate on the client. This method has two advantages: small business won't have to purchase commercial SSL certificates to secure remote access to e-mail, and the consultant won't have to configure SSL manually for the server or the clients.

- Configure attachment blocking for Exchange server

  A list of the attachment file types is displayed and can be reconfigured here.

- Configure a password policy

  At the end of the Internet wizard, it displays a prompt to configure the password policy. Password length, complexity, and maximum password age are configurable options. No one has to figure out which group policy to set this in; it is just done. You do have to visit Group Policy to add the requirement for password history and minimum password age, but for the basics, there's no guess work. You do not have to understand Group Policy to set the password policy.

You are not done when you finish the wizard. Before you connect the server to the Internet, we recommend that you:

- Check once again to make sure things are configured the way you think they are. Open RRAS and view the basic firewall services and ports. Here is where you configure ports that were not choices in the wizard. Note, the list is by service, not by port number. What could be easier? Want to use a custom port for a service? No problem. Do not use the offered check boxes, but add your own custom service and enter the port number desired.
- Do not just run the Internet Connection Wizard as the only security configuration. You should also add users and computers, configure NTFS Access Control Lists (ACLs), share resources, provide secure remote access, adjust security using Group Policy, set up patch management, and implement a backup plan. You probably also need to train users and figure out a polite way to keep the business owner from getting administrator rights on the server.
- Implement a hardware-based firewall. If the hardware firewall is plug-and-play compliant, you may be able to do the initial configuration by using the wizard. In such a configuration, if someone does compromises the hardware based firewall, there is still one layer of defence, which is the SBS 2003 built-in RRAS firewall. So, the intruder is not connected into the domain controller. If you are monitoring the network, maybe that gives you enough warning to disconnect the DC, or maybe the hardware-based firewall fails in a closed state and provides no entrance to the customer network at all.
- Use the RRAS firewall that comes with SBS 2003, if the customer does not want to invest in the hardware based firewall device.

- Use antivirus. There is no built-in antivirus protection in SBS 2003. If you are going to sell small business on Windows Small Business Server, do not forget to add in the cost of antivirus product.
- Use the Windows Small Business Server Monitoring Configuration Wizard to configure monitoring and set up monitoring of the security log. You can use this wizard to watch the security log and send an alert when a number of failed logons or other security event occurs. You can build a simple intrusion detection system using the monitoring tools on SBS 2003.

However, that does actually raise a concern that it might be too simple. If we teach small business owners that all they have to do is run a few wizards, we are right back where we started. They will run the wizards but will not know the right answers to the questions. They'll think they are secure, but they won't be. That is where you come in. The small business owner has enough to do running the business. He or she needs to know *what* to do to secure information systems but shouldn't have to know *how* to do it. Knowing how to do it is the role of the IT consultant. You become the added value in the secure IT solution for small business.

4.5 Customer training

Implementing a new or upgraded server provides opportunities to change existing business processes. At least basic user training can be offered to each customer to enable them to take advantage of new features. If there will be an on-site administrator, there are several suggestions for training the customer in the Customer Training Staff document delivered with this Project Guide.

4.6 Additional services

IBM @server xSeries Small Business Foundations provides a strong foundation for delivering additional high-value services to the customers. Because the server software platform is already available, consultants are able to focus on the business solution required without needing to implement additional platform software. Examples of additional services include Internet and intranet site development, implementation of financial and customer relationship management systems, mobile device integration, and network security audits.

A

Disk RAID levels

RAID stands for *redundant array of independent disks* and is a technology that lets you form larger disk partitions by combining multiple physical disks. The various ways of combining the disks also include methods to enhance the reliability or fault tolerance of the hardware by adding levels of redundancy. This appendix presents a brief technical overview of RAID and the performance issues as they relate to commercial server environments.

RAID is a collection of techniques that treat multiple, inexpensive disk drives as a unit, with the object of improving performance and/or reliability. Table A-1 lists the RAID levels that are offered by RAID controllers in xSeries servers.

Table A-1 RAID summary

RAID level	Fault tolerant?	Description
RAID-0	No	All data evenly distributed (striping) to all drives.
RAID-1	Yes	A mirrored copy of one drive to another drive (two disks).
RAID-1E	Yes	All data is mirrored (more than two disks).
RAID-5	Yes	Distributed checksum. Both data and parity are striped across all drives.
RAID-5E	Yes	Distributed checksum and hot-spare. Data, parity, and hot-spare are striped across all drives.
RAID-5EE	Yes	Distributed checksum and hot-spare. Data, parity, and hot-spare are striped across all drives. Same as RAID-5E except has faster rebuild times
RAID-10	Yes	Striping (RAID-0) across multiple RAID-1 arrays.
RAID-50	Yes	Striping (RAID-0) across multiple RAID-5 arrays.

The RAID level that you choose depends on the performance and level of data protection that you desire, the usable space that you require, and the cost.

RAID-0

RAID-0 is a technique that stripes data evenly across all disk drives in the array. Strictly, it is not a RAID level, as no redundancy is provided. On average, accesses is random, thus keeping each drive equally busy. SCSI has the ability to process multiple, simultaneous I/O requests, and I/O performance is improved because all drives can contribute to system I/O throughout. Since RAID-0 has no fault tolerance, when a single drive fails, the entire array becomes unavailable.

RAID-0 offers the fastest performance of any RAID strategy for random commercial workloads. RAID-0 also has the lowest cost of implementation because redundant drives are not supported.

Important: RAID-0 cannot tolerate a drive failure. Do not use RAID-0 unless your data does not change (that is, it is read-only) and you have a copy on some other media.

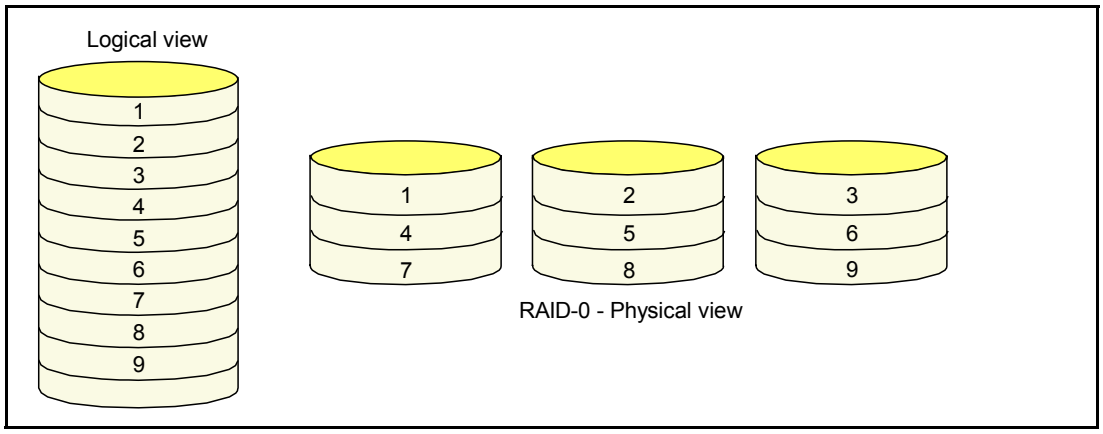


Figure A-1 RAID-0: Evenly distributed data but no fault tolerance

RAID-1

RAID-1 provides fault tolerance by mirroring one drive to another drive. The mirror drive ensures access to data should a drive fail. RAID-1 also has good I/O throughput performance compared to single-drive configurations because read operations can be performed on any data record on any drive contained within the array.

Write performance is somewhat reduced because both drives in the mirrored pair must complete the write operation. For example, two physical write operations must occur for each write command generated by the operating system.

RAID-1 offers significantly better I/O throughout performance than RAID-5. However, RAID-1 is somewhat slower than RAID-0.

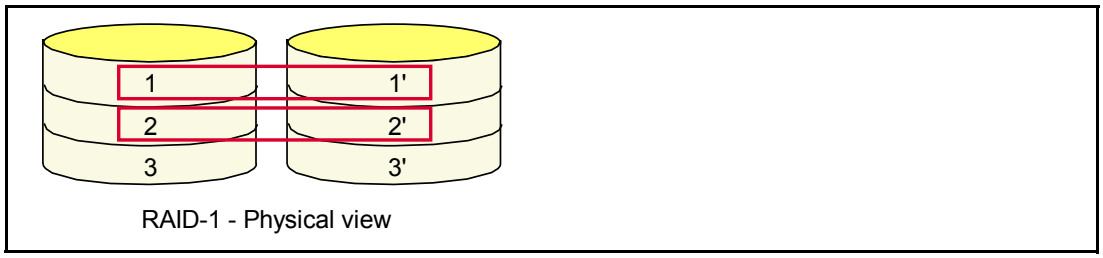


Figure A-2 RAID-1: Fault-tolerant; a mirrored copy of one drive to another drive

RAID-1E

RAID-1 Enhanced, or more simply, RAID-1E, is only implemented by the IBM ServeRAID adapter and allows a RAID-1 array to consist of three or more disk drives. RAID-1 consists of exactly two drives.

The data stripe is spread across all disks in the array to maximize the number of spindles that are involved in an I/O request to achieve maximum performance. RAID-1E is also called *mirrored stripe,* as a complete stripe of data is mirrored to another stripe within the set of disks. Like RAID-1, only half of the total disk space is usable. The mirror uses the other half.

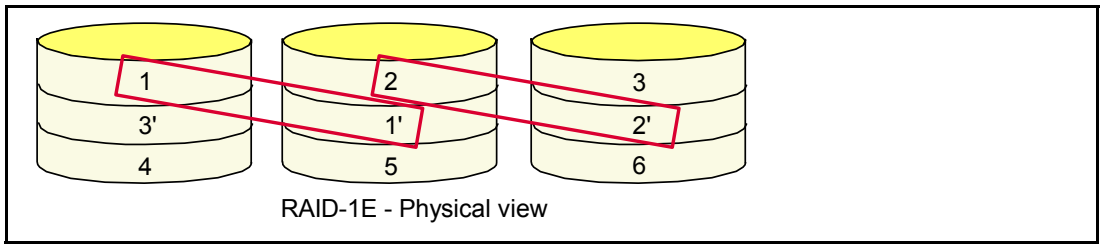


Figure A-3 RAID-1E: Mirrored copies of each drive

Because you can have more than two drives (with a maximum of 16), RAID-1E outperforms RAID-1. The only situation where RAID-1 performs better then RAID-1E is in the reading of sequential data because when a RAID-1E reads sequential data off a drive, the data is striped across multiple drives. RAID-1E interleaves data on different drives, so seek operations occur more frequently during sequential I/O. In RAID-1, data is not interleaved, so fewer seek operations occur for sequential I/O.

You can also use RAID-10 to increase the number of drives in a RAID-1 array, as described in “Composite RAID levels” on page 79. This technique consists of creating a RAID-0 array and mirroring it with another collection of similar-capacity drives. Thus, you can configure two sets of five drives each in a RAID-0 configuration, and mirror the two sets of drives.

This configuration would deliver the same performance for most commercial applications as a 10-drive RAID-1E configuration, but RAID-1E lacks one added benefit. Each of the RAID-0 arrays in the RAID-10 configuration can be contained in two different drive enclosures. Thus, if one drive enclosure fails because of a bad cable or power supply, the other mirror set can provide data access. With RAID-10, an entire set of drives (five in this case) can fail, and the server can still access the data.

RAID-5

RAID-5 offers an optimal balance between price and performance for most commercial server workloads. RAID-5 provides single-drive fault tolerance by implementing a technique called *single equation single unknown*. This technique implies that if any single term in an equation is unknown, the equation can be solved to exactly one solution.

The RAID-5 controller calculates a *checksum* (parity stripe in Figure A-4) using a logic function known as an exclusive-or (XOR) operation. The checksum is the XOR of all data elements in a row. The RAID controller hardware can perform the XOR result quickly, and it can use the result to solve for the unknown data element.

In Figure A-4, addition is used instead of XOR to illustrate the technique: stripe 1 + stripe 2 + stripe 3 = parity stripe 1-3. Should drive one fail, stripe 1 becomes unknown, and the equation becomes *X* + stripe 2 + stripe 3 = parity stripe 1-3. The controller solves for *X* and returns stripe 1 as the result.

A significant benefit of RAID-5 is the low cost of implementation, especially for configurations requiring a large number of disk drives. To achieve fault tolerance, only one additional disk is required. The checksum information is evenly distributed over all drives, and checksum update operations are evenly balanced within the array.

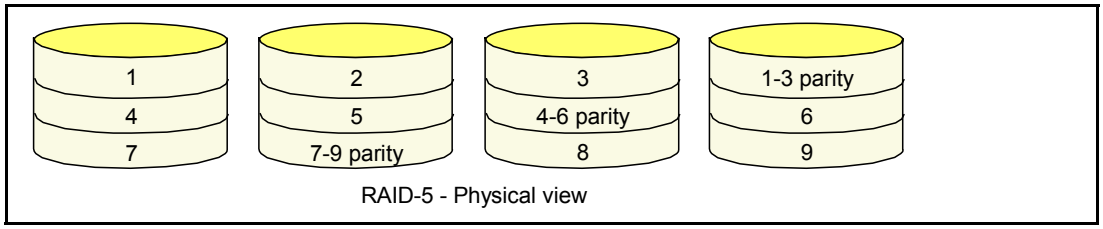


Figure A-4 RAID-5: both data and parity are striped across all drives

RAID-5 does, however, yield lower I/O throughout than RAID-0 and RAID-1 because of the additional checksum calculation and write operations that are required. In general, I/O throughput with RAID-5 is 30% to 50% lower than with RAID-1 (the actual result depends upon the percentage of write operations). A workload with a greater percentage of write requests generally has a lower RAID-5 throughput. RAID-5 provides I/O throughput performance similar to RAID-0 when the workload does not require write operations (read only).

RAID-5EE and RAID-5E

RAID-5E was invented by IBM research, and is a technique that distributes the hot-spare drive space over the N+1 drives comprising the RAID-5 array plus standard hot-spare drive. It was first implemented in ServeRAID firmware V3.5.

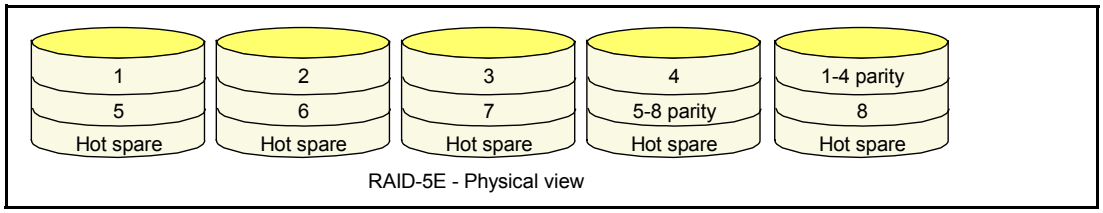


Figure A-5 RAID-5E: the hot spare is integrated into all disks, not a separate disk

RAID-5EE was introduced to overcome the long rebuild times associated with RAID-5E in the event of a hard drive failure. Some older ServeRAID adapters only support RAID-5E. For more information, see the IBM Technote *ServeRAID Adapter Quick Reference* at the following Web address:

http://www.redbooks.ibm.com/abstracts/tips0054.html

Adding a hot-spare drive to a server protects data by reducing the time spent in the critical state. This technique does not make maximum use of the hot-spare drive because it sits idle until a failure occurs. Often many years can elapse before the hot-spare drive is ever used.

IBM invented a method to utilize the hot-spare drive to increase performance of the RAID-5 array during typical processing and preserve the hot-spare recovery technique. This method of incorporating the hot spare into the RAID array is called RAID-5EE.

RAID-5EE is designed to increase the normal operating performance of a RAID-5 array in two ways:

- The hot-spare drive contains data that can be accessed during normal operation. The RAID-5 array now has an extra drive to contribute to the throughput of read and write operations. Standard 10000 RPM drives can perform more than 100 I/O operations per second so the RAID-5 array throughput is increased with this extra I/O capability.
- The data in RAID-5EE is distributed over N+1 drives instead of N as is done for RAID-5. As a result, the data occupies fewer tracks on each drive. This has the effect of physically using less space on each drive, keeping the head movement more localized, and reducing seek times.

Together, these improvements yield a typical system-level performance gain of about 10% to 20%.

One downside of RAID-5EE is that the hot-spare drive cannot be shared across multiple physical arrays as with standard RAID-5 plus hot-spare. This RAID-5 technique is more cost-efficient for multiple arrays because it allows a single hot-spare drive to provide coverage for multiple physical arrays. This configuration reduces the cost of using a hot-spare drive, but the downside is the inability to handle separate drive failures within different arrays. IBM ServeRAID adapters offer increased flexibility by providing the choice to use either standard RAID-5 with hot-spare or the newer integrated hot-spare provided with RAID-5EE.

Composite RAID levels

The ServeRAID adapter family supports composite RAID levels. This means that it supports RAID arrays that are joined together to form larger RAID arrays.

The ServeRAID firmware only supports 8 arrays, therefore only 16 drives (8 spanned RAID arrays) are supported in RAID-1. RAID-00, RAID-1E0, and RAID-50 can support more total drives as long as the total number of arrays is 8 or less.

For example, RAID-10 is the result of forming a RAID-0 array from two or more RAID-1 arrays. With two SCSI channels each supporting 15 drives, the ServeRAID 6M can theoretically have up to 30 drives in one array. With the EXP300 and the EXP400, the limit is 56 disks.

Figure A-6 on page 80 shows a ServeRAID RAID-10 array.

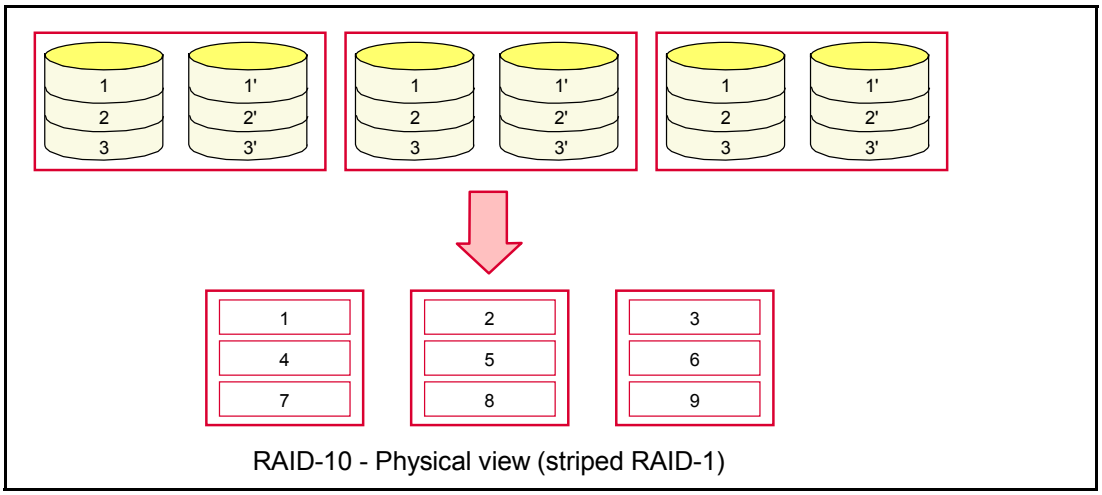


Figure A-6 RAID-10: a striped set of RAID-1 arrays

Likewise, Figure A-7 shows a striped set of RAID-5 arrays.

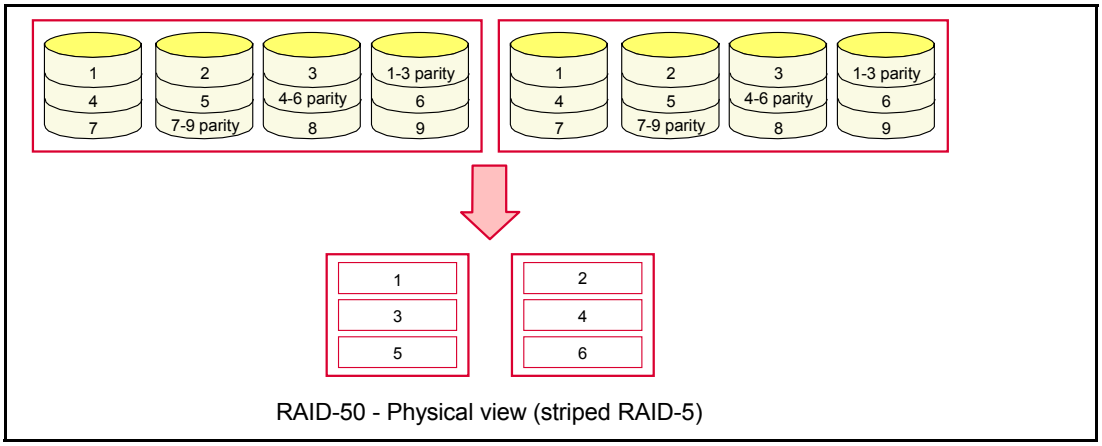


Figure A-7 RAID-50: a striped set of RAID-5 arrays

Table A-2 shows the combinations that the ServeRAID-4 family supports.

Table A-2 Composite RAID levels supported by ServeRAID-4 adapters

RAID level	The sub-logical array is	The spanned array is
RAID-00	RAID-0	RAID-0
RAID-10	RAID-1	RAID-0
RAID-1E0	RAID-1E	RAID-0
RAID-50	RAID-5	RAID-0

Table A-3 shows a summary of the performance characteristics of some of the RAID levels.

Table A-3 Summary of RAID performance characteristics

RAID level	Data capacity[1]	Sequential I/O performance[2]		Random I/O performance[2]		Data availability[2]	
		Read	Write	Read	Write	With hot-spare	Without hot-spare
Single Disk	n	6	6	4	4	0	Not applicable
RAID-0	n	10	10	10	10	0	Not applicable
RAID-1	n/2	7	5	6	3	7	8
RAID-1E	n/2	5	4	7	6	8	9
RAID-5	n-1	7	7[3]	7	4	7	8
RAID-5E	n-2	8	8[3]	8	5	8	Not applicable
RAID-10	n/2	10	9	7	6	9	9

Notes:
1 In the data capacity column, *n* refers to the number of equally sized disks in the array.
2 10 = best, 1=worst. You should only compare values within each column. Comparisons between columns is not valid for this table.
3 With the write back setting enabled.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this IBM Redpaper.

IBM Redbooks

For information on ordering these publications, see “How to get IBM Redbooks” on page 84. Note that some of the documents referenced here may be available in softcopy only.

- *Implementing Systems Management Solutions Using IBM Director,* SG24-6188
- *Introduction to PCI Express*, TIPS0456
- *Introduction to DDR2 Memory*, TIPS0455
- *Tuning Windows Server 2003 for Performance*, REDP-3942

Other publications

These publications are also relevant as further information sources:

- Brelsford, Harry. *Windows Small Business Server 2003 Best Practices*. SMB Nation Press, 2003. ISBN 0-974858-04-8
- Author, Title, Publisher, Year, ISBN
- *Windows Small Business Server 2003 Getting Started*, included with SBS 2003
- *Implementing Microsoft Windows Small Business Server 2003 Project Guides* available for registered business partners at the following:

  http://members.microsoft.com/certpartner/projectguides/wsbs2003.aspx

Online resources

These Web sites and URLs are also relevant as further information sources:

- IBM Support Web site

  http://www.pc.ibm.com/support
- Feature Guide for Windows Small Business Server 2003

  http://www.microsoft.com/windowsserver2003/sbs/evaluation/features/default.mspx
- Pricing of Windows Small Business Server 2003

  http://www.microsoft.com/windowsserver2003/sbs/howtobuy/pricing.mspx#ENAA
- IBM ServeRAID software matrix

  http://www.ibm.com/pc/support/site.wss/MIGR-495PES.html
- Windows Server Catalog

  http://go.microsoft.com/fwlink/?LinkId=4303

How to get IBM Redbooks

You can search for, view, or download Redbooks, Redpapers, Hints and Tips, draft publications and Additional materials, as well as order hardcopy Redbooks or CD-ROMs, at this Web site:

ibm.com/redbooks

Help from IBM

IBM Support and downloads

ibm.com/support

IBM Global Services

ibm.com/services

Introducing Windows Small Business Server 2003 on IBM @server xSeries Servers

Redpaper

Describes the products from Microsoft and IBM

Explains how to install Windows Small Business Server 2003

Suggests ways consultants can help customers

Many small businesses have already invested in multiple desktop PCs for their employees, thereby increasing their productivity. The next step in a company's technology evolution is enabling computer users to easily share their computer resources ó their information, files, printers, faxes, and even their applications ó using a centralized PC server such as an IBM eServer xSeries server running Windows Small Business Server 2003.

The purpose of this paper is to introduce the Windows Small Business Server 2003 product and to give useful decision guidance for prospective customers. It describes the xSeries server offerings and bundles in the small business market, specifically prepared for operation with Windows Small Business Server 2003. This document also talks about the role of IT consultants and value-added resellers (VARs) in the process of defining the individual customer needs, proposing and implementing the right solution, and offering additional services for maintaining the small business server solution.

This redpaper is targeted at IBM Business Partners and customers wishing to understand the Microsoft and IBM offerings.

INTERNATIONAL TECHNICAL SUPPORT ORGANIZATION

BUILDING TECHNICAL INFORMATION BASED ON PRACTICAL EXPERIENCE

IBM Redbooks are developed by the IBM International Technical Support Organization. Experts from IBM, Customers and Partners from around the world create timely technical information based on realistic scenarios. Specific recommendations are provided to help you implement IT solutions more effectively in your environment.

For more information:
ibm.com/redbooks