Part I

Microsoft Windows Server 2003 Administration Fundamentals

The fundamental tasks you need for Microsoft Windows Server 2003 administration are covered in Part I. Chapter 1 provides an overview of Windows Server 2003 administration concepts, tools, and techniques. Chapter 2 explores the tools you'll need to manage Windows Server 2003 systems.

Chapter 3 covers monitoring services, processes, and events. Chapter 4 discusses Group Policy and also explains how to automate common administrative tasks. Chapter 5 explains how to work with support services and establish remote desktop connectivity through Terminal Services.

Chapter 1

Overview of Microsoft Windows Server 2003 System Administration

Microsoft Windows Server 2003 represents a major advance in reliability, availability, and manageability. Not only is the operating system more versatile than its predecessors, but it also builds on the revolutionary system management and administration concepts introduced with Windows 2000, including

- **Active Directory directory service** An extensible and scalable directory service that uses a namespace based on the Internet standard Domain Name System (DNS).
- **IntelliMirror** Change and configuration management features that support mirroring of user data and environment settings as well as central management of software installation and maintenance.
- **Security Architecture** The architecture provides improvements for smart cards, public and private encryption keys, and security protocols. It also features tools for analyzing system security and for applying uniform security settings to groups of systems.
- **Terminal Services** Services that allow you to remotely log on to and manage other Windows Server 2003 systems.
- **Windows Script Host** A scripting environment for automating common administration tasks, such as creating user accounts or generating reports from event logs.

Although Windows Server 2003 has dozens of other new features, each of the features just listed has far-reaching effects on how you perform administrative tasks. None has more effect than Active Directory technology. A sound understanding of Active Directory structures and procedures is essential to your success as a Windows Server 2003 systems administrator.

That said, the Windows Server 2003 security architecture also has a far-reaching effect on how you perform administrative tasks. Through Active Directory and administrative templates, you can apply security settings to workstations and servers throughout the organization. Thus, rather than managing security on a machine-by-machine basis, you can manage security on an enterprise-wide basis.

Still, one of the biggest changes has to do with the realignment of product families. Clients systems are now organized under the Windows XP umbrella and server systems are now organized under the Windows Server 2003 umbrella. The focus of this book is on managing the Windows Server 2003 family of operating systems. If you want to learn more about managing Windows XP, a good resource is *Microsoft Windows XP Professional Administrator's Pocket Consultant* (Microsoft Press, 2001).

Microsoft Windows Server 2003

The Windows Server 2003 family of operating systems consists of Windows Server 2003, Standard Edition; Windows Server 2003, Enterprise Edition; Windows Server 2003, Datacenter Edition; and Windows Server 2003, Web Edition. Each edition has a specific purpose:

- **Windows Server 2003, Standard Edition** Designed to provide services and resources to other systems on a network. It's a direct replacement for Windows NT 4.0 Server and Windows 2000 Server. The operating system has a rich set of features and configuration options. Windows Server 2003, Standard Edition supports up to 4 gigabytes (GB) of RAM and four CPUs.
- **Windows Server 2003, Enterprise Edition** Extends the features provided in Windows Server 2003, Standard Edition to include support for Cluster Service, metadirectory services, and Services for Macintosh. It also supports 64-bit Intel Itanium-based computers, hot swappable RAM, and nonuniform memory access (NUMA). Enterprise servers can have up to 32 GB of RAM on x86, 64 GB of RAM on Itanium, and eight CPUs.
- **Windows Server 2003, Datacenter Edition** The most robust Windows server. It has enhanced clustering features and supports very large memory configurations with up to 64 GB of RAM on x86 and 128 GB of RAM on Itanium. It has a minimum CPU requirement of 8 and can support up 32 CPUs in all.
- **Windows Server 2003, Web Edition** Designed to provide Web services for deploying Web sites and Web-based applications. As such, this server edition includes the Microsoft .NET Framework, Microsoft Internet Information Services (IIS), ASP.NET, and network load-balancing features but lacks many other features, including Active Directory. In fact, the only other key Windows features in this edition are the Distributed File System (DFS), Encrypting File System (EFS), and Remote Desktop for administration. Windows Server 2003, Web Edition supports up to 2 GB of RAM and two CPUs.

Note The various server editions support the same core features and administration tools. This means you can use the techniques discussed in this book regardless of which Windows Server 2003 edition you're using. Note also that because you can't install Active Directory on the Web Edition, you can't make a server running Windows Server 2003, Web Edition a domain controller. The server can, however, be a part of an Active Directory domain.

When you install a Windows Server 2003 system, you configure the system according to its role on the network.

- Servers are generally assigned to be part of a workgroup or a domain.
- Workgroups are loose associations of computers in which each individual computer is managed separately.
- Domains are collections of computers that you can manage collectively by means of domain controllers, which are Windows Server 2003 systems that manage access to the network, to the directory database, and to shared resources.

Note In this book, "Windows Server 2003" and "Windows Server 2003 family" refers to the family of four products: Windows Server 2003, Standard Edition; Windows Server 2003, Enterprise Edition; Windows Server 2003, Datacenter Edition; and Windows Server 2003, Web Edition. The various server editions support the same core features and administration tools.

All versions of Windows Server 2003 allow you to configure different views for the Start Menu. The views for the Start Menu are

- **Classic Start Menu** The view used in previous versions of Windows. With this view, clicking Start displays a pop-up dialog box with direct access to common menus and menu items.

  With the Classic Start Menu, you access administrative tools by clicking Start, clicking Programs, and then clicking Administrative Tools. You access the Control Panel by clicking Start, pointing to Settings, and then clicking Control Panel.
- **Simple Start Menu** Allows you to directly access commonly used programs and directly execute common tasks. You can, for example, click Start and then click Log Off to quickly log off the computer.

  With the Simple Start Menu, you access administrative tools by clicking Start and then clicking Administrative Tools. You access the Control Panel by clicking Start and then clicking Control Panel.

Domain Controllers and Member Servers

When you install Windows Server 2003 on a new system, you can configure the server to be a member server, a domain controller, or a stand-alone server. The differences between these types of servers is extremely important. Member servers are a part of a domain but don't store directory information. Domain controllers are distinguished from member servers because they store directory information and provide authentication and directory services for the domain. Stand-alone servers aren't a part of a domain and have their own user database. Because of this, stand-alone servers also authenticate logon requests themselves.

Windows Server 2003 doesn't designate primary or backup domain controllers. Instead, it supports a multimaster replication model. In this model any domain controller can process directory changes and then replicate those changes to other domain controllers automatically. This differs from the Windows NT single master

replication model in which the primary domain controller stores a master copy and backup controllers store backup copies of the master. Additionally, Windows NT distributed only the Security Account Manager (SAM) database, but Windows Server 2003 distributes an entire directory of information called a *data store*. Inside the data store are sets of objects representing user, group, and computer accounts as well as shared resources, such as servers, files, and printers.

Domains that use Active Directory are referred to as Active Directory domains. This distinguishes them from Windows NT domains. Although Active Directory domains can function with only one domain controller, you can and should configure multiple domain controllers in the domain. This way, if one domain controller fails, you can rely on the other domain controllers to handle authentication and other critical tasks.

In an Active Directory domain, any member server can be promoted to a domain controller, and you don't need to reinstall the OS as you had to in Windows NT. To promote a member server, all you need to do is install the Active Directory component on the server. You can also demote domain controllers to be member servers, provided that the server isn't the last domain controller on the network. You promote and demote domain controllers by using the Active Directory Installation Wizard and following these steps:

1. Click Start.
2. Click Run.
3. Type **dcpromo** in the Open field, and then click OK.

Understanding and Using Server Roles

Servers running Windows Server 2003 are configured based on the services they offer. You can add or remove services at any time by using the Configure Your Server Wizard and following these steps:

1. Click Start.
2. Click Programs or All Programs as appropriate.
3. Click Administrative Tools, and then select Configure Your Server Wizard.
4. Click Next twice. Windows Server 2003 gathers information about the server's current roles. The Server Role page displays a list of available server roles and specifies whether they're configured. Adding and removing roles is easy:
   - If a role isn't configured and you want to add the role, click the role in the Server Role column and then click Next. Follow the prompts.
   - If a role is configured and you want to remove the role, click the role in the Server Role column and then click Next. Read any warnings displayed carefully and then follow the prompts.

Any server can support one or more of the following server roles:

- **Application server** A server that provides XML Web services, Web applications, and distributed applications. When you configure a server with this role, IIS, COM+, and the Microsoft .NET Framework are installed automatically. You also have the option of adding Microsoft FrontPage Server Extensions and enabling or disabling ASP.NET.

- **DHCP server** A server that runs the Dynamic Host Configuration Protocol (DHCP) and can automatically assign Internet Protocol (IP) addresses to clients on the network. This option installs DHCP and starts the New Scope Wizard.
- **DNS server** A server that runs DNS resolves computer names to IP addresses and vice versa. This option installs DNS and starts the DNS Server Wizard.
- **Domain controller** A server that provides directory services for the domain and has a directory store. Domain controllers also manage the logon process and directory searches. This option installs DNS and Active Directory.
- **File server** A server that serves and manages access to files. This option enables you to quickly configure disk quotas and indexing. You can also install the Web-based file administration utility, which installs IIS and enables Active Server Pages (ASP).
- **Mail server (POP3, SMTP)** A server that provides basic Post Office Protocol 3 (POP3) and Simple Mail Transfer Protocol (SMTP) mail services so that POP3 mail clients can send and receive mail in the domain. Once you install this service, you define a default domain for mail exchange and then create and manage mailboxes. These basic services are best for small offices or remote locations where e-mail exchange is needed but you don't need the power and versatility of Microsoft Exchange Server.
- **Print server** A server that provides and manages access to network printers, print queues, and printer drivers. This option enables you to quickly configure printers and print drivers that the server should provide.
- **Remote access/VPN server** A server that routes network traffic and manages dial-up networking or virtual private networking (VPN). This option starts the Routing and Remote Access Setup Wizard. You can configure routing and remote access to allow outgoing connections only, incoming and outgoing connections, or no outside connections at all.
- **Server cluster node** A server that operates as part of a group of servers working together called a *cluster*. This option starts the New Server Cluster Wizard, which allows you to create a new cluster group, or the Add Nodes Wizard, which allows you to add the server to an existing cluster. (This server role is supported by the Enterprise and Datacenter versions only.)
- **Streaming media server** A server that provides streaming media content to other systems on the network or the Internet. This option installs Windows Media Services. (This server role is supported by the Standard and Enterprise versions only.)
- **Terminal Server** A server that processes tasks for multiple client computers running in terminal services mode. This option installs Terminal Server. You don't need to install Terminal Server to remotely manage this server. Remote Desktop is installed automatically with the OS.
- **WINS server** A server that runs Windows Internet Name Service (WINS) resolves NetBIOS names to IP addresses and vice versa. This option installs WINS.

Once installed, you can manage server roles using Manage Your Server. This enhanced utility in Windows Server 2003 might just become your command and control center. As shown in Figure 1-1, the current role(s) of the server are displayed in Manage Your Server. You access this tool from the Administrative Tools menu. Click Start, Program or All Programs and then select Manage Your Server. Use the quick links provided to manage the installed server roles and related information.

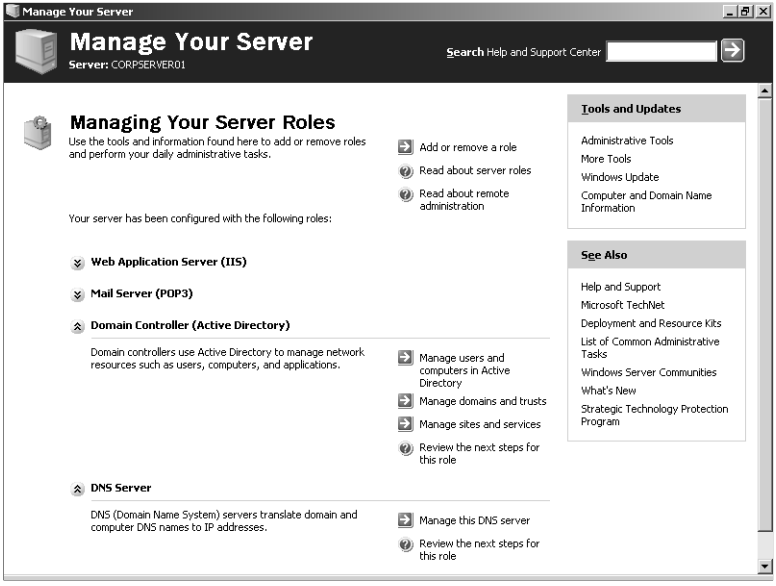

Figure 1-1. *Manage Your Server provides quick access to frequently used tools and information.*

Tip Use the arrow icons to the left of the role name to shrink or expand the role information provided. Don't overlook Tools And Updates and See Also. Under these headings you'll find links for quick access to Administrative Tools, Windows Update, the System Properties dialog box, Help And Support, and more. As a final note, although you might be tempted to select the Don't Display This Page At Logon check box (it's in the lower-left corner of the dialog box), I don't suggest doing it. I've found that most of the tools I routinely work with and the tasks I regularly perform can be quickly accessed from this dialog box. It really is a good command and control center.

Other Windows Server 2003 Resources

Before we examine administration tools, let's look at other resources that you can use to make Windows Server 2003 administration easier. One of the system administrator's greatest resources is the Windows Server 2003 distribution disk. It contains

all the system information you'll need whenever you make changes to a Windows Server 2003 system. Keep the disk handy whenever you modify a system's configuration. You'll probably need it.

To avoid having to access a Windows Server 2003 distribution disk whenever you make system changes, you might want to copy the \I386 directory to a network drive. When you're prompted to insert the CD-ROM and specify the source directory, you simply point to the directory on the network drive. This technique is convenient and saves time. Other resources you might want to use are examined in the sections that follow.

Windows Server 2003 Support Tools

While you're working with the distribution CD-ROM, you might want to install the Windows Server 2003 Support Tools. The support tools are a collection of utilities for handling everything from system diagnostics to network monitoring.

Installing the Support Tools You can install the support tools by completing the following steps:

1. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.
2. When the Autorun screen appears, click Perform Additional Tasks, and then click Browse This CD. This starts Windows Explorer.
3. In Windows Explorer, double-click Support and then double-click Tools.

Note Throughout this book, I refer to double-clicking, which is the most common technique used for accessing folders and running programs. With a double-click, the first click selects the item and the second click opens/runs the item. In Windows Server 2003 you can also configure single-click open/run. Here, moving the mouse over the item selects it and a click opens/runs the item. You can change the mouse click options with the Folder Options utility in the Control Panel. To do this, select the General Tab, and then choose Single-Click To Open An Item or Double-Click To Open An Item, as appropriate.

4. Double-click Suptools.msi. This starts the Windows Support Tools Setup Wizard. Click Next.
5. Read the End User License Agreement and then, if you agree and want to continue, click I Agree and then click Next.
6. Enter your user information, and then click Next.
7. Select the destination directory for the support tools. The default location is %ProgramFiles%\Support Tools. If you don't want to use the default location, type a new directory path or click Browse to search for a location. The tools use about 23 MB of disk space.
8. Click Install Now.

Note %ProgramFiles% refers to the ProgramFiles environment variable. The Windows OS has many environment variables, which are used to refer to user-specific and system-specific values. Often, I'll refer to environment variables using this syntax: %*VariableName*%.

Using the Support Tools After installation you can access the support tools through the Tools Management Console shown in Figure 1-2. To start the console, click Start, click Programs or All Programs as appropriate, click Windows Support Tools, and then select Support Tools Help.

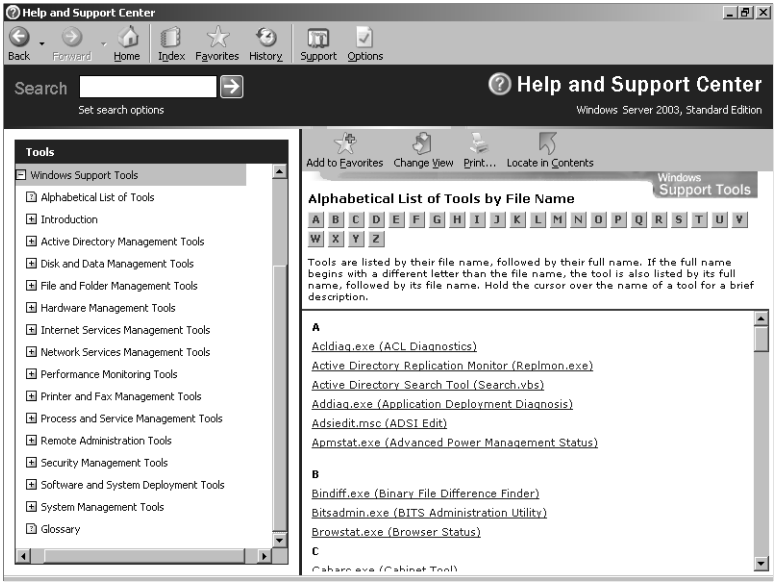

Figure 1-2. *Use support tools to perform such tasks as system diagnostics and network monitoring.*

As the figure shows, the tools are organized by file name, tool name, and category. Clicking a tool name accesses a help page that displays the online help documentation for the tool and that you can also use to run the tool.

Frequently Used Tools

Many utilities are available for administrating Windows Server 2003 systems. The tools you'll use the most include

- **Control Panel** A collection of tools for managing system configuration. With Classic Start Menu, you can access these tools by selecting Start, choosing Settings, and then selecting Control Panel. With Simple Start Menu, you can access these tools by selecting Start and then selecting Control Panel.

- **Graphical administrative tools** The key tools for managing network computers and their resources. You can access these tools by selecting them individually on the Administrative Tools submenu.
- **Administrative wizards** Tools designed to automate key administrative tasks. Unlike in Windows NT, there's no central place for accessing wizards. Instead, you access wizards by selecting the appropriate menu options in other administrative tools.
- **Command-line utilities** You can launch most administrative utilities from the command line. In addition to these utilities, Windows Server 2003 provides others that are useful for working with Windows Server 2003 systems.

The following sections provide brief introductions to these administrative utilities. Additional details for key tools are provided throughout this book. Keep in mind that to use these utilities you might need an account with administrator privileges.

Using Control Panel Utilities

Control Panel contains utilities for working with a system's setup and configuration. You can organize the Control Panel in different ways according to the view you're using. A view is simply a way of organizing and presenting options. The key utilities you'll want to use include

- **Add Hardware** Starts the Add Hardware Wizard, which you can use to install and troubleshoot hardware.
- **Add Or Remove Programs** Used to install programs and to safely uninstall programs. Also used to modify Windows Server 2003 setup components. For example, if you didn't install an add-on component, such as Certificate Services, during installation of the OS, you can use this utility to add it later.
- **Date And Time** Used to view or set a system's date, time, and time zone. Rather than manually setting the time on individual computers in the domain, you can use the Windows Time Service to automatically synchronize time on the network.
- **Display** Used to configure backgrounds, screen savers, video display mode, and video settings. You can also use this utility to specify desktop icons and to control visual effects, such as the menu fade effect.
- **Folder Options** Used to set a wide variety of folder and file options, including the type of desktop used, the folder views used, whether offline files are used, and whether you need to single-click or double-click to open items.
- **Licensing** On a workstation you use this utility to manage licenses on a local system. On a server it also allows you to change the client-licensing mode of installed products, such as Windows Server 2003 or Microsoft SQL Server.
- **Network Connections** Used to view network identity information, to add network components, and to establish network connections. You can also use this utility to change a system's computer name and domain. See Chapter 7, "Core Active Directory Administration," and Chapter 16, "Managing TCP/IP Networking," for details.

- **Printers And Faxes** Provides quick access to the Printers And Faxes folder, which you can use to manage print devices on a system. See Chapter 17, "Administering Network Printers and Print Services," for more information on managing network printers.
- **Scheduled Tasks** Allows you to view and add scheduled tasks. You can schedule tasks on a one-time or recurring basis to handle common administrative jobs. To learn more about scheduled tasks, see Chapter 4, "Automating Administrative Tasks, Policies, and Procedures."
- **System** Used to display and manage system properties, including properties for startup/shutdown, environment, hardware profiles, and user profiles. This utility is explored in Chapter 2, "Managing Servers Running Microsoft Windows Server 2003."

Using Graphical Administrative Tools

Windows Server 2003 provides several types of tools for system administration. The graphical user interface (GUI)-based tools are the ones you'll use the most. Usually you can use graphical administrative tools to manage the system to which you're currently logged on, as well as systems throughout Windows Server 2003 domains. For example, in the Component Services console you specify the computer you want to work with by right-clicking the Event Viewer entry in the left panel and then choosing Connect To Another Computer. This opens the Select Computer dialog box shown in Figure 1-3. You can then choose Another Computer and type the name of the computer, as shown.

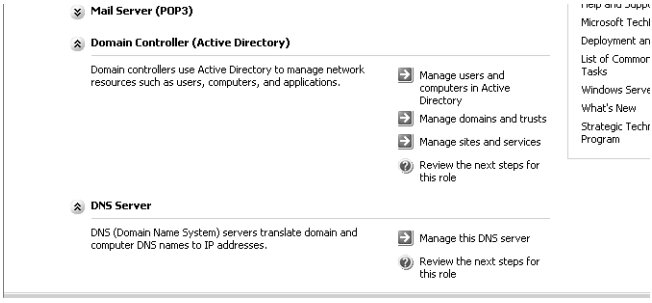

Figure 1-3. *Connecting to another computer allows you to manage remote resources.*

Key Graphical Administrative Tools

Table 1-1 lists the key graphical administrative tools and their uses. You can access these tools by selecting them on the Administrative Tools submenu or by double-clicking Administrative Tools in the Control Panel.

Table 1-1. Quick Reference for Key Windows Server 2003 Administration Tools

Administrative Tool	Purpose
Active Directory Domains and Trusts	Manage trust relationships between domains
Active Directory Sites and Services	Create sites to manage the replication of Active Directory information
Active Directory Users and Computers	Manage users, groups, computers, and other objects in the Active Directory
Certification Authority	Manage certificate services
Cluster Administrator	Manage the Cluster service
Component Services	Configure and manage COM+ applications; manage events and services
Computer Management	Start and stop services, manage disks, and access other system tools
Configure Your Server	Add, remove, and configure Windows services for the network
Connection Manager Administration Kit	Configure and customize Connection Manager
Data Sources (ODBC)	Add, remove, and configure Open Database Connectivity (ODBC) data sources and drivers
DHCP	Configure and manage the DHCP service
Distributed File System	Create and manage distributed file systems that connect shared folders from different computers
DNS	Manage the DNS service
Domain Controller Security Policy	View and modify security policy for a domain controller's organizational unit
Domain Security Policy	View and modify domain security policy
Event Viewer	Manage events and logs
Internet Information Services (IIS) Manager	Manage Web, File Transfer Protocol (FTP), and SMTP servers
Licensing	Manage client access licensing for server products
Microsoft Network Monitor	Monitor network traffic and troubleshoot networking problems
Performance	Display graphs of system performance and configure data logs and alerts
QoS Admission Control	Manage the Quality of Service (QoS) Admissions Control service, which provides resource and bandwidth management for network traffic
Remote Desktop	Configure remote connections and view remote desktop sessions

(continued)

Table 1-1. Quick Reference for Key Windows Server 2003 Administration Tools *(continued)*

Administrative Tool	Purpose
Remote Storage	Manage the Remote Storage service, which automatically transfers data from infrequently used files to tape libraries
Routing and Remote Access	Configure and manage the Routing and Remote Access service, which controls routing interfaces, dynamic IP routing, and remote access
Server Extensions Administrator	Manage server extensions, such as the Microsoft FrontPage Server extensions
Services	Manage the startup and configuration of Windows services
Telnet Server Manager	Manage telnet service and user sessions
Terminal Services Configuration	Manage Terminal Service protocol configurations and server settings
Terminal Services Manager	Manage and monitor Terminal Service users, sessions, and processes
WINS	Manage WINS, which resolves NetBIOS names to IP addresses

Tools and Configuration

Which administrative tools are available on your system depends on its configuration. When you add services, the tools needed to manage those services are installed on the server. These same tools might not be available in Windows XP Professional or on another server. In this case you might want to install the administration tools on the workstation you're using. To install Windows Server 2003 Administration Tools, complete the following steps:

1. Log on to the workstation using an account with administrator privileges.
2. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.
3. When the Autorun screen appears, click Perform Additional Tasks, and then click Browse This CD. This starts Windows Explorer.
4. Double-click I386 and then double-click Adminpak.msi. The complete set of Windows Server 2003 management tools are installed on your workstation or server.

Real World The Windows 2000 administration tools are incompatible with Windows XP Professional and Windows Server 2003. If you upgraded to Windows XP Professional from Windows 2000 Professional, you'll find that many of the Windows 2000 administration tools won't work, and you'll encounter errors frequently. You should uninstall these tools and instead install the Windows Server 2003 Administration Tools Pack (Adminpak.msi) on the Windows XP Professional systems that administrators use. The Windows Server 2003 administration tools are compatible with both Windows 2000 and Windows Server 2003.

Using Command-Line Utilities

Many command-line utilities are included with Windows Server 2003. Most of the utilities you'll work with as an administrator rely on Transmission Control Protocol/Internet Protocol (TCP/IP). Because of this, you should install TCP/IP networking before you experiment with these tools.

Utilities to Know

As an administrator, you should familiarize yourself with the following command-line utilities:

- **ARP** Displays and manages the IP-to-Physical address mappings used by Windows Server 2003 to send data on the TCP/IP network.
- **AT** Schedules programs to run automatically.
- **DNSCMD** Displays and manages the configuration of DNS services.
- **FTP** Starts the built-in FTP client.
- **HOSTNAME** Displays the computer name of the local system.
- **IPCONFIG** Displays the TCP/IP properties for network adapters installed on the system. You can also use it to renew and release DHCP information.
- **NBTSTAT** Displays statistics and current connections for NetBIOS over TCP/IP.
- **NET** Displays a family of useful networking commands.
- **NETSH** Displays and manages the network configuration of local and remote computers.
- **NETSTAT** Displays current TCP/IP connections and protocol statistics.
- **NSLOOKUP** Checks the status of a host or IP address when used with DNS.
- **PATHPING** Traces network paths and displays packet loss information.
- **PING** Tests the connection to a remote host.
- **ROUTE** Manages the routing tables on the system.
- **TRACERT** During testing, determines the network path taken to a remote host.

To learn how to use these command-line tools, type the name at a command prompt followed by **/?**. Windows Server 2003 then provides an overview of how the command is used (in most cases).

Using NET Tools

You can more easily manage most of the tasks performed with the NET commands by using graphical administrative tools and Control Panel utilities. However, some of the NET tools are very useful for performing tasks quickly or for obtaining information, especially during telnet sessions to remote systems. These commands include

- **NET SEND** Sends messages to users logged in to a particular system
- **NET START** Starts a service on the system

- **NET STOP** Stops a service on the system
- **NET TIME** Displays the current system time or synchronizes the system time with another computer
- **NET USE** Connects and disconnects from a shared resource
- **NET VIEW** Displays a list of network resources available to the system

To learn how to use any of the NET command-line tools, type **NET HELP** followed by the command name, such as **NET HELP SEND**. Windows Server 2003 then provides an overview of how the command is used.