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TROUBLESHOOTING STARTUP PROBLEMS

RUNNING SYSTEM CONFIGURATION UTILITY

Some software programs (especially system utilities) run automatically at start-up, without appearing in the taskbar. Troubleshooting conflicts involving these "stealth" programs can be difficult, unless you use the System Configuration Utility. Its Selective Startup options enable you to shut down all programs and boot with a clean, Windows-only configuration; if that cures the problem, you can begin adding programs back, one at a time, until you find the guilty piece of software.

To launch the System Configuration Utility, click the Start button, choose Run, and type MSCONFIG in the Run box. Press Enter, and Windows opens the dialog box shown here.
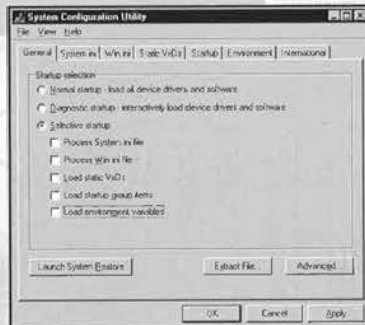
TRACKING DOWN PROBLEMS

Most of the time, the problem is a startup program, and your job is to find the one that's causing the problem. Here's how to do it:

1. Run ScanDisk (using the Thorough option) and scan your system for viruses first.
2. Open the System Configuration Utility and uncheck the Load Startup Group Items box on the General tab.

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CHAPTER **13**

USING WINDOWS ON A NOTEBOOK COMPUTER

In this chapter

SETTING UP WINDOWS ON A NOTEBOOK COMPUTER

During the Setup process, Windows Me asks you to specify the type of installation you want. The choices are Typical, Portable, Compact, and Custom. To install the Windows Me components that are useful for mobile computer hardware, select the Portable option and click Next.

Tip from	During Windows Me installation, you can also choose the Custom option and select the notebook components individually.

The Portable installation includes support for PC Card (formerly called PCMCIA) devices, power management tools for optimizing battery conservation, docking station compatibility, infrared transmissions, and direct cable connections for communicating with other computers. Even if you don't choose the Portable option during your installation, you can always go back and manually add these notebook-specific components through the Windows Setup tab of the Add/Remove Programs Properties dialog box (see Figure 13.1).

Figure 13.1
Add the Windows Me notebook support components manually through Windows Setup.

To manually add operating system components to your notebook computer, use the following procedure:

1. Open the Start menu and choose Settings, Control Panel.

2. Click the Add/Remove Programs icon to display the Add/Remove Programs Properties dialog box.

3. Select the Windows Setup tab.

4. Double-click a component category (such as Accessories) to bring up a list of the components under that heading. Then, place a check next to the components you want to install.

5. Click OK to close the window for the individual category and return to the Add/Remove Programs Properties dialog box. Then, click OK again.

Here's a list of the categories that contain useful notebook components that might not already be installed:

- **Accessibility**—Here, you'll find the options for modifying your mouse and screen settings to enable better viewing on notebook LCD panels. These components, which are intended for use by people with physical disabilities, often prove handy for notebook computer users, too. Mouse cursor options and a screen magnification tool help you find and control your mouse even on small screens.

- **Accessories**—The Briefcase makes synchronizing files between your notebook and desktop computers easier.

- **Communications**—Under this heading, choose the components for Dial-Up Networking and Direct Cable Connection. (Wireless Link, the program that enables you to send infrared data to printers or other computers, is installed automatically by Windows Me when you install or activate the infrared port on your computer.) Dial-Up Networking controls Internet connections via a modem. Direct Cable Connection lets you transfer data from your notebook to another computer over a parallel or serial cable.

- **System Tools**—If your disk space is extremely limited, you can use Drive Space 3 disk compression, which enables you to store much more information in a smaller drive. Keep in mind, though, that compressed drives run more slowly and must be kept in tip-top condition with frequent use of ScanDisk and Defrag to avoid problems. Compressing data enables you to pack more information into a smaller drive. As an alternative way to save space for data files or programs you use rarely, you can install the Compressed Folders utility, which enables you to create and extract files from PKZIP-compatible archives.

MANAGING POWER ON A PORTABLE PC

Recent and new-model portable and desktop PCs feature power management capabilities that let you specify schemes for conserving power (and battery life) by shutting down devices (such as hard disks, CD-ROMs, parallel and serial ports, and so on) after a specified time of inactivity. Windows Me takes advantage of these hardware designs and offers a software control for power management schemes under the Power Management object of the Control Panel.

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ACPI Support

To use the Windows Me power management features, your PC must support power management through its BIOS. Read your PC's documentation to find out whether the machine supports power management and to determine how to enable the capability in the BIOS.

If you can get a BIOS upgrade that supports the more advanced ACPI power management standard (see the following), install that upgrade *before* you install Windows Me, so that the extra features of ACPI will be recognized and supported by Windows Me.

Before you install a BIOS upgrade to your system, follow these steps for safety:

- Back up your important information.
- If your BIOS update program lets you make a backup copy of your current BIOS image, make a backup first before replacing it with a newer version.
- Make sure you download the *correct* BIOS update for your system. Be especially careful if you are trying to find a BIOS update for a "white box" generic system assembled from miscellaneous parts. You must contact the motherboard maker for updates in such cases.
- A flash BIOS update takes as long as three minutes to complete. If you lose power during the update, or install an incorrect BIOS update, your system will not operate.

You'll find much more about BIOS updates, including troubleshooting, in Scott Mueller's *Upgrading and Repairing PCs, 12th Edition*, from Que.

If you need to locate a BIOS update for a motherboard in a generic computer or have other BIOS update questions, see Wim's BIOS Page online at www.ping.be/bios.

Over the last few years, the computer industry has developed two major standards for PC power management. The original specification was called Advanced Power Management (APM) 1.0, and it defined interactions among a PC's hardware, *BIOS*, and software that let the PC operate at varying levels of power consumption including full power, sleep, and standby. Subsequent revisions of APM added the capability to manage the power consumption of PC Card devices and portables with multiple batteries, as well as other features.

The very latest PC power management scheme, which is supported by newer computers, is called Advanced Configuration and Power Interface (ACPI) 1.0. ACPI supports the fine-tuned management of a wide variety of hardware devices, as well as a new feature called OnNow, which enables a computer to start in just a few seconds without going through the normal boot process and to restore programs to where you last left them. Windows Me supports both APM and ACPI on computers that have the appropriate BIOS and hardware for these power conservation schemes.

You can determine whether your notebook computer has an ACPI BIOS installed by viewing the System Devices category of the Device Manager, as shown in Figure 13.2.

For notebook computers, the most important aspect of power conservation is extended battery life.

Figure 13.2
A system with ACPI
BIOS support
installed.

By setting power management options for your notebook's hardware under Windows Me, you can operate your notebook for several hours on batteries without being connected to an electrical outlet. Devices that can be set for power conservation under Windows Me include hard disk drives; monitors and LCD panels; serial, parallel, and USB ports; CD-ROM drives; DVD-ROM drives; PC Card devices; and keyboards, mice, and joysticks.

CONFIGURING POWER MANAGEMENT OPTIONS

The Power Management icon in the Control Panel gives you access to controls for setting your desired level of power management on your notebook or desktop system. Windows Me automatically checks to see which type of power management schemes your PC supports and then displays a list of devices (on the Power Management Properties sheet) that can be set for various power conservation levels.

Why should you use different power conservation levels? When you're plugged into an AC socket, you want a bright screen and don't want your computer to make you wait for drives to spin up, even after you've been away from your mouse and keyboard for a coffee break. But, when you're stuck inside an airplane flying a holding pattern after a cross-country flight, you're probably willing to put up with a dimmer screen and drives that rest when you stop typing so that your battery will last longer. With the Power Management feature of Windows Me, you can customize how your devices use power, depending on what you're doing and to which type of power your computer is connected. As you move from AC to battery power, Power Management lets you adjust device settings to match.

To modify the settings for your PC's power management, use the following procedure:

1. Open the Start menu and choose Settings, Control Panel.

2. If the Power Options icon isn't visible, click View all Control Panel options.

3. Double-click the Power Options icon to display the Power Options Properties dialog box (see Figure 13.3). On some systems, you might see different tabs such as Hibernate

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or Intel Speedstep Technology listed. The exact options you will see depend on your hardware.

Figure 13.3
Use the Power Options Properties dialog box to control the power management settings.

4. In the Power Schemes box, choose the name of your power management scheme. The default names are Portable/Laptop, Home/Office Desk, and Always On. The Settings box displays the complete list of PC devices that support power management.

5. In the Settings for Portable/Laptop Power Scheme box, choose the power conservation settings for each device.

   Use the two drop-down lists to indicate which kind of action you want to take place and how long the system should wait before performing that action. For example, with the settings shown in Figure 13.3, after 15 minutes, Windows Me turns off the monitor to conserve power when powered by AC power and after 3 minutes when battery powered. If you never want a particular device to power down, choose Never in the Turn Off Hard Disks field.

6. Click Apply to put your new settings into effect.

7. Click OK to close the Power Options Properties dialog box.

In some cases, docked, for example, you'll probably want to use different power management settings than when it's not docked.

To create a new power scheme, use the following procedure:

1. Open the Control Panel and double-click the Power Management icon.

2. Choose the settings for the individual devices as described in the preceding procedure.

3. In the Power Schemes box, click the Save As button to display the Save Scheme dialog box.

4. Type in a name for the new scheme and click OK to save it.

> **Note**
>
> If you want to display the Power Meter on the Windows Me taskbar, check that option on the Advanced tab of the Power Management Properties dialog box.

USING HIBERNATE

If your computer supports ACPI power management, you can use the Hibernate option to put your computer into a sort of "suspended animation." Enabling Hibernate will let your system store data in memory to a special location on disk and then shut down. When you restart your computer, you will be returned to the computer's state when you put the computer into hibernate. The Hibernate feature is especially useful on notebook computers, enabling users to quickly shut down the computer to catch a flight and immediately return to their current work after the plane has reached a "comfortable cruising altitude."

To enable hibernation, follow these steps:

1. Open the Power Options icon in Control Panel.
2. Select the Hibernate tab.
3. Review the total disk space available and the disk space required to hibernate your computer.
4. If you have plenty of free disk space, you can safely enable hibernation; enable hibernation by clicking in the box next to Enable Hibernate Support (see Figure 13.4).

Figure 13.4
Enabling Hibernate mode.

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5. Click OK to save the changes.
6. When you click Start, Shut Down, and pull down the list of options, Hibernate appears on the list of options.
7. Select Hibernate to save the computer's current state before shutting down.

Note

You cannot go into Hibernate if you have a document open on a network shared resource. Close the document on the shared resource before you Hibernate. You also cannot go into Hibernate if your computer is sharing its Internet connection with other computers.

USING PC CARD DEVICES

Almost all notebook computers now come with credit card-size PC Card slots (sometimes still called PCMCIA slots for their original use as memory slots) for quickly adding or removing devices. A wide variety of devices can be found on PC Cards, including network adapters, hard drives, SCSI adapters, modems, sound cards, video capture cards, and so forth. Windows Me works with the PC Card controller on your notebook to activate these devices. As with docking stations, Windows Me lets you insert and remove PC Cards on-the-fly (called *hot-swapping*) without rebooting the PC. Hot-swapping is useful in many circumstances, including the following:

- You want to switch from a network card (useful for the office) to a modem (useful on the road).
- You need to attach to a SCSI device sometimes, and an IEEE-1394 (FireWire, i.Link) device at other times.

With hot-swappability, you can freely insert and remove PC Cards at any time without turning off your computer or restarting it.

PC Card devices enable you to quickly expand the capability of your notebook without sacrificing the small size and travel weight of the base notebook platform. Notebooks typically come with one, two, or three PC Card slots, so sometimes PC Card manufacturers put two or more functions on one PC Card (such as a modem and a network adapter). Windows Me improves over Windows 95 in the handling of multifunction PC Cards by automatically recognizing the individual functions of these types of cards. Windows Me lets you configure and enable the functions separately.

Note

In the past, the PC Card data path was limited to 16 bits. Newer PC Card controllers support PC Card32 (Cardbus), which expands the data path for PC Cards to 32 bits. Windows Me supports PC Card32, which enables high-bandwidth data transfer to and from PC Card devices. PC Card devices that require this type of bandwidth include video capture cards and 10/100Mbs networking cards.

Caution

Before you buy devices available in the Cardbus format, make sure your notebook's PC Card slots can use Cardbus devices; plugging a Cardbus card into a non-Cardbus slot can damage the device and the slot.

INSTALLING PC CARD DRIVERS

If your portable computer has PC Card slots, Windows Me automatically recognizes and loads the PC Card components of the operating system during the operating system installation. During the installation, Windows Me preserves any existing PC Card support software so as not to accidentally disable any PC Card devices. Windows Me requires a 32-bit Protected mode driver for any card that will be supported via the Plug and Play architecture. Plug and Play PC Card support enables Windows Me to maximize performance, dynamically load drivers, and stay aware of the insertion and removal of PC Card devices.

To enable 32-bit PC Card support, activate the PC Card Wizard using the following procedure:

1. Open the Start menu and choose Settings, Control Panel.

2. Double-click the PC Card (PCMCIA) icon. If this icon is not present, you do not have support for the PC Card controller installed. Use the Add New Hardware Wizard to detect and install the software for your PC Card controller, and then restart the computer to enable PC Card support.

3. After you double-click the PC Card icon, you should see status information on the number of PC Card slots in your computer (1, 2, or 3). Empty slots will list the word (Empty) next to the slot number. Slots with PC Cards installed will list the card model next to the slot number. If you want to eject PC Cards quickly from an icon on the Taskbar, make sure that Show Control on Taskbar is selected (see Figure 13.5).

Figure 13.5
A computer with PC Card support enabled and one of its two PC Card slots in use.

4. If you see no card status information listed, check the Device Manager to see whether the PCMCIA category is listed. It should contain the following items without any yellow ! or red x marks indicating problems:

   • PCIC or compatible PC Card controller
   • PC Card Services

Windows Me will install PC Card support automatically when the PC Card controller is properly installed.

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5. If a yellow **!** symbol is listed next to the PC Card controller in Device Manager, either remove the device listing and restart the computer to redetect it or use the Add New Hardware Wizard to reinstall it. If a red **X** is listed, open the properties for the device and enable it in the current hardware profile.

6. After the PC Card controller has been installed and the system rebooted, Windows Me should detect the PC Card controller and install the PC Card Services software. Reboot the computer again, and your PC Card slots should be ready to work.

If you're having any difficulty getting a particular PC Card to work, use the Windows Me help system, which includes several topics specific to the use of PC cards.

To view help for PC Cards, use the following procedure:

1. Open the Start menu and choose Help to display the Windows Help screen.

2. Enter **PC Card** in the search window at the top of the screen.

3. Select the appropriate topic from the PC Card help topics displayed.

INSTALLING PC CARD DEVICES

After you have enabled 32-bit PC Card support, Windows Me can usually install PC Card devices automatically. When you insert a modem card, for example, Windows Me detects the new card and automatically installs the new drivers for it. If your PC Card is not recognized automatically, you must manually install support for it.

To manually install a PC Card device other than a modem or network adapter, use the following procedure:

1. Insert the new PC Card into an appropriate slot. (Read the card's documentation and your system's documentation to determine whether to use a specific slot.)

2. Open the Control Panel and choose the Add New Hardware object to start the Add New Hardware Wizard. Then, click Next.

3. Choose Yes and then Next to enable the wizard to automatically detect your new PC Card device.

4. If it is incapable of detecting the new device, the wizard displays a hardware selection dialog box. Choose the type of device you are installing and click Next.

5. Answer the questions regarding your problem and click Next to continue with the troubleshooting session.

6. Select the manufacturer of the device you are installing from the Manufacturers list. Then, choose the model of the device from the Model list on the right. If you cannot find your particular device or if your device includes a driver disk, click Have Disk and then follow the onscreen instructions for installing the driver.

7. Click OK to complete the new hardware installation process.

Tip from

EQ

Windows Me has drivers for many, but not nearly all, of the many PC Card devices that have been produced. If you cannot locate a Windows Me–specific driver, you can also use Windows 98 or Windows 95 drivers. However, Windows 98 drivers are preferred.

Make sure that you correctly identify the device before you install the driver. If you are unsure of the exact card model, download all drivers for that particular type of device from the manufacturer's Web site and expand the drivers into different folders. Then, you can try each driver until you find the correct one for your hardware.

Even if Windows Me lists a driver for your device, check with the manufacturer for the latest driver, which may offer better features or other benefits.

REMOVING OR INSERTING PC CARD DEVICES

Before you remove a PC Card device, you should shut it down. Windows Me offers two ways to do this safely:

- The PC Card (PCMCIA) properties sheet in the Control Panel
- The Unplug or Eject Hardware icon in the Toolbar

The Unplug or Eject Hardware icon supports both PC Cards and other hot-swappable devices found on some notebook computers and supports multiple-feature cards. Because it is easier to access and more flexible, it is the recommended way to remove PC Cards.

Tip from

EQ

If you do not see this icon in the Toolbar, enable it in the PC Cards Wizard in the Control Panel, as discussed earlier in this chapter.

To remove a PC Card from your system, follow these steps:

1. Choose the Unplug or Eject Hardware object in the toolbar to display a listing of all removable devices (see Figure 13.6).

Figure 13.6
The Unplug or Eject Hardware screen displays removable devices.

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2. To shut down a device, select the device from the list and click Stop.

3. Confirm the device selection and click OK. Windows Me shuts down the device and informs you when it is safe to remove the device from your system.

If you want to shut down only one part of a multifunction PC Card, such as a modem/Ethernet card combo, enable the Display Device Components option. This lists the features in a multifunction card, enabling you to select which feature to eject (disable). To insert a new device, you don't need to follow any procedure. Simply insert the device into an appropriate PC Card slot, and Windows Me automatically starts services for it.

If you prefer to use the PC Card icon in the Control Panel to stop the card, follow this procedure:

1. Choose the PC Card object in the Control Panel to display the Windows Me PC Card Properties dialog box. There you'll find the list of active PC Cards and their sockets.

2. To shut down a device, select the device from the list on the Socket Status page and click Stop. Windows Me shuts down the device and lists the socket as empty. Then, you can physically remove the card from the PC Card slot.

MANAGING DIAL-UP NETWORKING CONNECTIONS

With the *Dial-Up Networking* capabilities of Windows Me, you can access other computers, a LAN, or the Web through an Internet service provider (ISP). This section covers the notebook-specific techniques of setting up locations, connecting to a remote system, accessing ISPs, and autodialing.

Despite the fact that Dial-Up Networking via modem is far slower than using a network card in the office for accessing the Internet or office network, it's still useful. Most hotels around the country still don't offer a broadband connection, and you also might find yourself connecting from home (which might be a local call) or from a hotel (almost always a long-distance call) with your office or your ISP. If your office allows you to access your computer via modem, you're never without your documents. And, with the growth of online backup, you can save your files to a virtual drive on the Internet if you forgot to buy an overpriced box of floppies at the airport gift shop before you caught your flight.

Dial-Up Networking's capability to let you create multiple locations and connections enables you to create a library of connections you can reuse whenever you revisit a location. Even if you seldom stay at the same hotel twice, just knowing how to modify the dial-up number used by your ISP in each city will make reviewing this section worthwhile.

LOCATION SETUP

Windows Me provides an easy way to set up your location, which is particularly useful if you're traveling with your notebook. For example, you can quickly connect to remote locations while staying in a hotel by modifying the Telephony location setting in the Control Panel.

To modify your location setting, use the following procedure:

1. Open the Start menu and choose Settings, Control Panel.

2. Choose the Telephony object. The first time you choose this object, Windows Me asks you to select your Country/Region from a list and enter the area code of your home base. Do that, and then click Next to display the Dialing Properties dialog box.

3. In the I Am Dialing From box, enter a name for your new location (such as Hotel). Then, choose your new Country/Region, Area Code, any codes necessary for accessing an outside line and disabling call waiting, and your calling card information. Click Area Code Rules to specify how to handle calls within and outside your local calling area (see Figure 13.7).

Figure 13.7
Entering new location information in the My Locations Dialing Properties sheet.

4. When you finish, choose New. Windows Me displays a message box, informing you that your new location was created.

You can use your new Dial-Up Connections as you normally would at home, but now you are dialing from a different location.

CONNECTING TO A REMOTE SYSTEM

Using the Dial-Up Networking connection, you can access remote systems, such as your business's Windows NT server, from any location. Simply double-click your desktop's My Computer object and choose the Dial-Up Networking object. If you've already set up

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access to your remote system, it is listed among the objects in the Dial-Up Networking window. If you haven't already set up your connection, choose the Make a New Connection object, and the wizard will walk you through the steps. You'll end up with a Connect To dialog box similar to the one shown in Figure 13.8.

Figure 13.8
Verify your remote connection settings before choosing Connect.

Verify the User Name, Password, Phone Number and Location settings, and then choose Connect. If you have trouble connecting, confirm these settings with your system administrator. Also double-check your location parameters (as described in the preceding section, "Location Setup"). After you've established a connection, you can share files and data with the remote computer as you normally would.

USING A DIAL-UP NETWORKING SCRIPT

Some Internet service providers don't support Microsoft Challenge Handshake Authentication Protocol (MS CHAP), a type of encrypted password authentication system that allows you to keep your actual username and password stored safely on your system while you "handshake" with your ISP. Networks that don't support MS CHAP don't allow your system to remember your username and password when you create a connection; instead, you must enter your username and password each time you access their service. Fortunately, Windows Me supplies scripting tools for Dial-Up Networking so that you can automate this process if you want to.

You can find details of the scripting language in the SCRIPT.DOC file that's located in your default Windows folder (C:\Windows). In this file are instructions and examples for building a script that works with your service's login screens. After you build a script, you need to assign it to a Dial-Up Networking connection.

> **Note**
>
> The scripting language used by Windows Me is the same as used by Windows 95/98, enabling you to reuse or easily modify scripts you've created with those operating systems. This is not the same as the language-independent Windows Script Host scripting available with Windows 2000.

ASSIGNING A SCRIPT TO A DIAL-UP NETWORKING CONNECTION

After building a script, you must associate it with the Connection icon that you've already defined. Use the following procedure to assign a script to a Dial-Up Networking Connection icon:

1. Double-click the My Computer icon on your desktop and then choose the Dial-Up Networking icon.

2. In the Dial-Up Networking folder, highlight the dial-up icon to which you want to assign your new script.

3. From the Dial-Up Networking window, select File, Properties. Windows Me displays a Dial-Up Networking properties sheet.

4. Choose the Scripting tab to show the script assignment page of this connection. It will be similar to the one shown in Figure 13.9.

Figure 13.9
Use the Scripting tab of a Dial-Up Networking properties sheet to assign a script to a connection.

5. In the File Name text box, enter the name and path of your script. (Use the Browse button to find it if you don't remember the exact location.)

6. If you want to check each step of the script, click to place a check mark in the Step Through Script box.

7. Click OK to complete the process.

Your object now has a script assigned to it that runs each time you activate that Dial-Up Networking connection.

USING A NOTEBOOK DOCKING STATION

Docking stations provide an expandable platform for notebook computers. For travel, an *undocked* notebook contains the bare minimum of components needed to get the job done, which keeps weight down. But a *docked* station brings a notebook's flexibility up to that of a desktop computer in terms of card slots, drives, and devices.

Windows Me supports *hot-docking*, which means you can dock or undock a notebook without worrying about whether the notebook's power is on or off. The operating system automatically recognizes the added components of the docking station and sets up access to them. It also autoloads any necessary software drivers.

To undock a notebook while Windows Me is running, open the Start menu and choose Eject PC. Windows Me resets the configuration parameters of the notebook and then asks you to remove the notebook from the docking station.

You also can use hardware profiles (see the next section) to configure support for docking stations or to switch between configurations that can vary between locations. For example, you can set up a hardware profile called "office" that supports a docking station, a network connection, and an external monitor, and set up another one called "home" that supports a modem and game port.

CREATING AND MODIFYING HARDWARE PROFILES

Windows Me lets you set up multiple hardware profiles for different hardware configurations of your computer. When you install the operating system on a notebook, Windows Me sets up one hardware profile automatically for you. Then, when Windows Me detects a major change in hardware, such as when you connect your notebook computer to a docking station, it creates a second hardware profile for you. When you boot the PC, the operating system checks to see whether the PC is docked and then uses the appropriate profile.

If you want to modify a hardware profile or create a new one, use the following procedure:

1. Open the Start menu and choose Settings, Control Panel.

2. Double-click the System icon to display the System Properties dialog box.

3. Click the Hardware Profiles tab to display the Hardware Profiles page.

4. Select the hardware profile you want to use as the basis for your new profile and then click Copy. Windows Me displays a Copy Profile dialog box in which you can edit the name for your new hardware profile (see Figure 13.10).

5. Enter a name for your new hardware profile and then click OK. The new hardware profile appears in the Hardware Profile list.

Figure 13.10

In some cases, you might want to modify a hardware profile—if Windows Me fails to properly detect your hardware configuration, for example. You can manually adjust the hardware profile.

To manually adjust a hardware profile, use the following procedure:

1. Open the Control Panel and double-click the System icon. Then, click the Device Manager tab to display the Device Manager page.

2. Select the hardware device that you want to add or remove from a particular profile. Choose Properties to display the General page of the appropriate properties sheet.

3. At the bottom of the device's General page is a Device Usage list that defines which profiles should use this device (see Figure 13.11). To remove the device from the current profile, check Disable in This Hardware Profile. To add the device to the current hardware profile, make sure this box is not checked.

4. Click OK to apply the changes.

Figure 13.11
Use the Device Usage list to add or remove hardware from a profile.
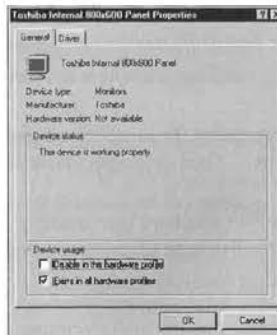
When you power on the system, Windows Me automatically detects the hardware profile you are using and applies the appropriate hardware profile. If your hardware profiles are so similar that Windows Me cannot determine which one to use, Windows Me displays a list of available profiles and prompts you to select the profile you want.

WORKING WITH DIFFERENT CONFIGURATIONS

In Windows Me, you can store various configurations for the same set of hardware devices. You could, for example, run your notebook's video graphics adapter at 800×600 resolution when you don't have an external monitor attached, but set up a profile for using 1024×768 resolution when you do have the monitor attached.

To configure a new profile with the same hardware set, first start Windows Me by using the hardware profile in which you want to make changes. To change the resolution for use with an external monitor, for example, select the hardware profile you use when you have the monitor attached. Then, change the settings for your new resolution. These changes are saved in the current hardware profile only; the other hardware profiles are unaffected.

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SYNCHRONIZING FILES BETWEEN TWO PCs

Most notebook PC users work on a desktop system as well. Many times users must transfer files back and forth between their notebook computer and their desktop computer. Someone who takes a notebook with her while traveling, for example, often finds the need to keep these two sets of files synchronized so that she doesn't lose valuable work. Windows

Me uses an improved version of the Briefcase feature introduced with Windows 95 to help users track and synchronize files shared between PCs.

Here is a typical scenario using Briefcase:

1. You create a Briefcase on your notebook PC.
2. Using Direct Cable Connection, you copy one or more files to the Briefcase over a network or from a desktop.
3. You modify and update the Briefcase files while traveling with your notebook.
4. While you are away from your office, a colleague modifies the same files on your desktop system.
5. When you return to the office you reconnect the notebook and desktop via a network connection or Direct Cable Connection. Then, you open the Briefcase on your notebook.
6. You use the Briefcase to determine which files have been modified and which are the most current versions. You also use the Briefcase to transfer updated files back and forth between the systems.

In essence, the Briefcase is an ordinary folder that has shell extensions and hidden database files that track file changes for files within the Briefcase folder. Windows Me creates one Briefcase folder on your desktop during the installation process. However, you might find that creating several small Briefcases where you need them might be more manageable. Additionally, using Briefcases on floppy disks isn't really recommended—even though the Windows documentation says you can—because of the limited space available on floppies.

Note

If you want to create a briefcase on a removable storage device, use an LS-120 SuperDisk or Zip drive if your notebook computer can use one (either an internal or external version). These offer 100MB or more of storage, allowing you plenty of space for Briefcase data.

INSTALLING BRIEFCASE

Again, Windows Me automatically creates a Briefcase called My Briefcase on your desktop during installation if you select the Portable configuration.

If you want to use Briefcase, but don't see the Briefcase icon on your desktop, you will need to install it.

To install Briefcase:

1. Choose Control Panel, Add/Remove Programs.
2. Select the Windows Setup tab.
3. Select the Accessories component.

4. Select Details.

5. Put a checkmark next to Briefcase.

6. Click OK twice to install Briefcase. The My Briefcase icon appears on your desktop.

7. Click OK again to install Briefcase.

CREATING A BRIEFCASE

Rather than use My Briefcase for all your file synchronization, you might prefer to create new Briefcases that relate to individual projects. To create a Briefcase, use the following procedure:

1. Determine where you want to create your new Briefcase. You can specify the desktop or a folder on any available drive.

2. To create a new Briefcase on the desktop, simply right-click the desktop, choose New, and then choose Briefcase. To create a new Briefcase on your hard drive, start Windows Explorer, select the folder in which you want to store the new Briefcase, and then choose File, New, Briefcase from the Explorer menu. Windows Me adds a new Briefcase object to the location you have specified.

3. To change the name of the new Briefcase folder, right-click the folder and choose Rename. Enter the new name for your Briefcase and press Enter.

ADDING FILES AND FOLDERS TO A BRIEFCASE

You can use standard file move and copy techniques to add files to a Briefcase. Simply open the folder (through My Computer, for example) where the files reside and drag them into the Briefcase folder. If you hold down the Ctrl key while dragging, the files are copied. If you hold down the Shift key, the files are moved.

You also can use Windows Explorer to copy or move files to a Briefcase. By right-clicking a file, you can send it to a Briefcase. Specifically, you right-click the file or files you want to send and choose Send To. From the list of files that appears, choose your Briefcase folder. Windows Me then copies the files you specified.

Caution

Be careful not to place one Briefcase inside another Briefcase. You cannot drag and drop a file into a Briefcase that is in another Briefcase.

Tip from

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If you right-drag a file to a Briefcase folder, a box displays your options: choose Move Here to move the file or Make Sync Copy to copy the file.

SYNCHRONIZING FILES

Synchronizing files is the key feature of the Briefcase. After you work with shared files remotely on your notebook, save them back to the Briefcase folder.

To do so, reconnect the two computers that you're sharing files between, open the Briefcase, and choose Update All from the controls at the top of the window. Windows Me displays a dialog box similar to the one shown in Figure 13.12.

Figure 13.12
The Briefcase displays how the files have been modified. One of the two files in the Briefcase needs to be updated.
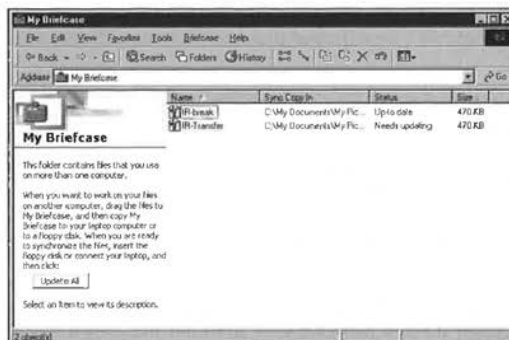
The Briefcase dialog box shows you when the files were last updated on each machine and which is the more recent version. If the actions suggested in the dialog box are appropriate, choose Update; Briefcase then performs those actions. If an action is not appropriate, right-click the action to change it. Windows Me displays your action options. If you just want to check the status but do not need to synchronize the files, choose Cancel in this window.

If you prefer to update individual files, select each file by clicking it (or hold down the Ctrl key and click a group of files). Then, choose Update Selection from the controls at the top of the Briefcase menu. Only the files you selected appear in the update list.

For the most effective use of Briefcase, update files across a network, Direct Cable Connection, or high-capacity removable disk (LS-120 or Zip). Using a floppy disk is usually incredibly slow.

SPLITTING FILE COPIES IN BRIEFCASE FROM ORIGINALS

In some cases, you might want to disassociate a Briefcase file from the original file. For example, you might need to generate two different reports from the same base file. If you do, you need to "split" the file in the Briefcase (the copy used for synchronization) from the original file. To do so, highlight the file within the Briefcase and choose Briefcase, Split from Original. Windows Me changes the entry for that file in the status column to Orphan.

Another way to split the copy from an original file is by using the file's properties sheet. Right-click the Briefcase file you want to split and choose Properties to display the file's

properties sheet. Choose the Update Status tab to see the file's synchronization status. Windows displays a dialog box similar to the one shown in Figure 13.13. Click Split From Original to remove the link between the files.

Figure 13.13
You can also split a file copy used for synchronization from an original via the file's properties sheet.
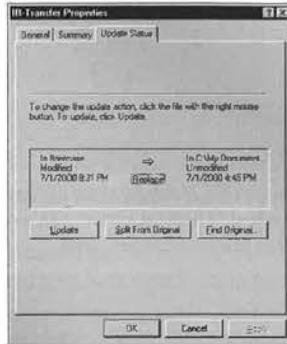
> **Note**
>
> Be careful when you use the file-splitting feature discussed in this section. After you create an orphan file by splitting the file for synchronization from its original, you can no longer synchronize that file. If you want to synchronize such a file, create a copy under another name and copy it to the Briefcase separately.

> **Caution**
>
> The Briefcase's synchronizing feature looks at file date/time stamps to determine which file is newer. If one of your computers doesn't have the correct date and time displayed, the wrong file could be replaced! Because changing the date and time is easy for both users and programs to perform, always double-check date and timestamps on files you plan to synchronize with Briefcase.

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SHARING RESOURCES VIA A DIRECT CABLE CONNECTION

With Direct Cable Connection (DCC), Windows Me enables you to share files and resources (such as a printer) with another computer through either a serial or parallel cable or wireless infrared port connecting the two systems. Direct Cable Connection can be used between any two computers, but because notebook computers sometimes lack CD-ROM drives or high-capacity removable-media drives, it is especially useful for connecting a notebook computer to a desktop computer that has the drives or information the notebook computer needs to access. If both PCs do not feature infrared ports, you must, of course, provide your own serial or parallel data-transfer cable to attach the PCs. After you make

the connection, you can quickly access or transfer files back and forth. Direct Cable Connection for Windows Me works the same way as the DCC utility supplied with Windows 95 and 98, enabling all three versions of Windows to communicate with each other.

> **Note**
>
> Windows Me can also use a separate utility called Wireless Link to send data to computers and printers via infrared ports. See "Using Infrared Connections" later in this chapter for details.

Under Direct Cable Connection, one PC acts as the host (or server), and the other PC assumes the role of guest (or client). The *host* PC is the gateway that enables the *guest* PC to access a network to which the host is attached. The host can act as a gateway for NetBEUI and IPX/SPX network protocols, as well as for TCP/IP networks.

> **Note**
>
> Direct Cable Connection requires that you have the same network protocol installed on both computers. I recommend that you install NetBEUI on both the host and guest computers if it isn't already present because it requires no configuration. Use IPX/SPX or TCP/IP if you want to use the host computer to act as a router to the rest of the network for the guest computer.

SETTING UP DIRECT CABLE CONNECTION

Windows Me automatically installs the Direct Cable Connection components unless you tell it not to with a custom installation. If, for some reason, Direct Cable Connection is not installed on your PC, you can install it from the Windows Me installation disc. Use the following procedure to install Direct Cable Connection from the installation disc:

1. Open the Start menu and choose Settings, Control Panel.
2. Choose the Add/Remove Programs object, and then select the Windows Setup tab.
3. In the Components list, double-click the Communications component to display the communications tools of Windows Me.
4. Click to place a check mark in the Direct Cable Connection box. (If a check is already there, this utility is already installed on your PC.)
5. Click OK, and Windows installs Direct Cable Connection.

Next, you must attach the two computers with a cable or use infrared ports. Check the documentation of both PCs to determine whether they offer infrared ports (see the section "Using Infrared Connections" later in this chapter for details). Otherwise, locate either a serial port null modem cable or parallel port data-transfer cable and use it to connect the two systems. Although infrared ports are very convenient to use with Direct Cable Connection, parallel ports provide much faster data transfer rates.

> **Note**
>
> Direct Cable Connection uses the same type of parallel or serial cables used by the following file-transfer programs:
>
> - MS-DOS 6.x Interlink/Intersvr
> - Traveling Software/LapLink.com's LapLink and similar file-transfer programs from other vendors
>
> Cables that originally came with LapLink or similar programs can be reused, or you can purchase the correct cables at most computer stores. You *cannot* use switchbox, modem, or extension cables with Direct Cable Connection because these types of cables are not wired correctly.

For best performance results, use a parallel port cable. Modern parallel ports can be set to different modes under a computer's BIOS. These settings are usually classified as standard bidirectional, enhanced parallel port (EPP), and enhanced capabilities port (ECP). For the fastest data transfer, set both computers to use either EPP or ECP mode for the parallel ports.

The final step involves setting one of the computers as the host and the other as the guest. Those procedures are outlined in the next two sections.

SETTING UP THE HOST

Again in Direct Cable Connection, you need to set up one computer as the host and the other as the guest. First, you must set up the host computer. To do so, use the following procedure:

1. Open the Start menu and choose Programs, Accessories, Communications, Direct Cable Connection. Windows Me asks whether you are setting up the host or the guest.

2. Select the Host option, and then click Next. Windows Me then asks you to choose the port to use for Direct Cable Connection.

3. Choose the port you want to use for your connection. If you are planning to use an infrared port, choose Install New Ports and follow the instructions for selecting your infrared device; Windows 95/98 and Me all refer to the infrared serial port as COM4. Otherwise, click Next.

4. Windows Me then asks whether you want to enable file and print sharing with the guest. If so, choose File and Print Sharing and follow the instructions. Otherwise, click Next.

5. Windows Me asks whether you want to password protect the host to prevent unauthorized access. To enable password protection, place a check mark next to Use Password Protection (as shown in Figure 13.14). Then, choose Set Password to enter the password the guest computer must use to access the host.

6. Click Finish to complete the setup.

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Figure 13.14
Check Use Password
Protection to restrict
access to the host.

SETTING UP THE GUEST

After you've configured the host, use the following procedure to set up the guest:

1. Open the Start menu and choose Programs, Accessories, Communications, Direct Cable Connection.

2. In the Direct Cable Connection dialog box, choose Guest and then Next.

3. Choose the port for the guest, and then click Next.

4. Click Finish to complete the setup.

USING DIRECT CABLE CONNECTION

After setup, you need to start the Direct Cable Connection software on both the host and guest computers before you can begin sharing resources. First, start the host computer by opening the Start menu and choosing Accessories, Communications, Direct Cable Connection. If the settings in the resulting dialog box are correct, choose Listen to set the host in the mode to communicate with a guest. If you want to change any of the settings, choose Change and make your changes.

Then, start the Direct Cable Connection on the guest computer. To do so, open the Start menu and choose Accessories, Communications, Direct Cable Connection. The dialog box that appears is similar to the one that starts the host except that now the Listen button is a Connect button. Choose Connect to activate the Direct Cable Connection soyou can begin sharing resources.

Because Direct Cable Connection is a two-station network, you can map drives and set up full or read-only access to shared resources. I've used Direct Cable Connection to do the following:

- Install software from a CD-ROM computer on the host machine to the guest machine
- Run a tape backup on the guest machine to back up the drive on the host machine

⚠ *See the "Problems with Direct Cable Connection" portion of the "Troubleshooting" section at the end of this chapter if you are unable to get Direct Cable Connection to work.*

USING INFRARED CONNECTIONS

Infrared light is below the spectrum of red light and is not visible to the human eye. Infrared (IR) ports on computers enable wireless connections between computers and devices, using the same infrared light employed by TV, stereo, and VCR remote controls. Windows Me supplies software supporting IR ports on notebooks and desktops. On a computer with an IR port, Windows Me lets you share files and resources, communicate with networks, and even print to other computers and peripherals with IR ports. Windows Me uses the industry-standard IrDA protocol for IR ports, enabling you to transfer data to computers and printers with IrDA-compliant IR ports. Unless Windows Me finds an IR port on your PC during the installation process, it will not install the IR component of the operating system. If, for some reason, your computer features an IR port but Windows Me did not install the IR software, you can load the software manually from the installation disc.

Windows Me treats IR ports as network devices. After an IR port has been installed on your system, you will have two additional entries under the Configuration tab of the Network properties sheet:

- The IR port
- The IrDA protocol, which is used to communicate over the IR port

For an example of these entries, see Figure 13.15.

Figure 13.15
The Network Components listing on a typical notebook computer with an infrared port, showing the Fast IR port and the IrDA protocol entries.

⚠ *If you are having some problems with your infrared connection, see "Basic Problems with Infrared Transmissions" in the "Troubleshooting" section at the end of this chapter.*

VIRTUAL IR PORTS

After Windows Me configures your computer's IR port, you'll also find two new entries under your Ports (COM and LPT) entry in the Device Manager, as shown in Figure 13.15:

- A Virtual Infrared COM port, for use with Wireless Link file transfers. Windows Me assigns this port to COM4 by default.
- A Virtual Infrared LPT port, for printing to IR-equipped printers. Windows Me assigns this port to LPT3 by default.

Windows Me automatically uses these virtual ports as necessary for file transfers and printing (see Figure 13.16).

Figure 13.16
The Virtual Infrared COM and LPT ports are used for infrared file transfers and printing.

PRINTING VIA THE IR PORT

When Windows Me's IR port is within range of a device with a compatible IR port, the IR icon is displayed on the toolbar. Move the mouse over the IR icon, and a message is displayed indicating which IR device has been contacted.

If the device is a printer that has not already been installed, Windows Me's Plug and Play configuration process starts to detect and load the correct driver for the printer. To verify that you have working communications with the printer, be sure to select the Print a Test Page option at the end of the process and view the results.

After the printer has been configured, you can print to it any time your Windows Me computer establishes contact with it.

To print a document using the IR port, follow these steps:

1. Position your computer so that its IR port is facing the IR port on the printer.
2. Watch for an IR status light on the printer to come on and stay on; this indicates that the IR ports on the computer and printer have made a connection.

3. Watch for the IR symbol to appear in the toolbar, indicating you have a connection. On computers with built-in sound, you will also hear the IR_BEGIN.WAV file play through your speakers.

4. Select File, Print from your application's menu and select the IR printer. Set the printing options you want to use and click OK to start the printing process.

5. While data is being transferred between the computer and the printer, a different IR icon on the toolbar indicates the data is being transferred. Move your mouse over the icon to see the transmission speed, as shown in Figure 13.17.

6. At the end of the print job, the IR icon changes back to its original form; you can send another print job or proceed to another task.

7. If the IR printing job is interrupted, a warning appears over the IR icon on the toolbar. You also will hear the IR_INTER.WAV file play through your speakers if your computer has built-in sound.
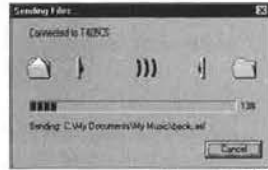
Figure 13.17

Using Wireless Link to Send Files to Another Computer

As an alternative to Direct Cable Connection, Windows Me features the new Wireless Link utility, which enables a Windows Me computer to send data to another IrDA-compliant computer, including Windows 95– and 98–based portable computers with IR ports.

To configure Wireless Link, open the Control Panel and open the Wireless Link object.

Wireless Link displays a configuration menu when no other compatible IR devices are within range.

Wireless Link has a single page in its properties sheet: File Transfer.

You can enable or disable the following:

- Display an icon on the taskbar indicating IR activity
- Allow others to send files to your computer
- Display status while receiving files

The default location for received files is C:\Windows\Desktop (the Windows Me desktop). Use the Browse key to change to another folder (see Figure 13.18).

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Caution

Storing files on the Windows Desktop is very dangerous! Users who want to unclutter the desktop might not notice that an icon on the desktop represents an actual file, rather than a shortcut, and delete it. You should use the Windows Explorer to create another folder and direct Wireless Link to use that location instead.

Figure 13.18
Configuring the
Wireless Link utility.
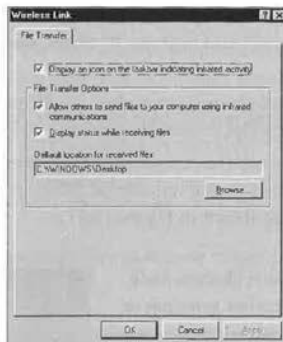
When you place your computer within range of another computer with a compatible IR port, you can send files via Wireless Link.

To transfer files, follow this procedure:

1. Watch for the message "Another computer with a wireless link is available" to appear near the taskbar. After that message disappears, you'll see the IR icon on the toolbar indicating that you have a working connection. You also might hear the IR_BEGIN.WAV file over your computer's speakers (see Figure 13.19).

Figure 13.19
When you see this message, Wireless Link has made contact with another wireless device.

2. Click the IR symbol to activate Wireless Link. The default location Wireless Link checks for files to send is the My Documents folder. Select Browse to locate other folders and the file you want to send.

3. You also can drag files to the Wireless Link shortcut on the desktop to send them.
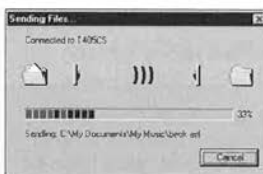
Figure 13.20

4. The Sending Files window appears, displaying the progress of your file transfer (see Figure 13.20).

5. After the file transfer is complete, you can send another file or close the Wireless Link window.

6. By default, Wireless Link creates a folder called My Received Files on the C: drive of the other computer and stores transmitted files in that folder.

USING WIRELESS LINK TO RECEIVE FILES FROM ANOTHER COMPUTER

If the other computer is running Windows Me, its Wireless Link feature can be used to initiate the file transfer if your computer is set to receive files. If the other computer is running a different version of Windows, use Direct Cable Connection instead.

TROUBLESHOOTING

BASIC PROBLEMS WITH INFRARED TRANSMISSIONS

I have installed the infrared component correctly but still have no infrared connection.

If you are having problems with your infrared connection, check these basic areas as you troubleshoot.

First, determine whether the distance between infrared adapters is correct. If you think that distance is the problem, try moving the devices closer together or farther apart. The devices cannot be more than three feet apart, and some devices work best if kept at least six inches apart. Make sure that no interference and no obstruction exists between the devices.

In addition, you should check the alignment between the infrared adapters. Infrared devices produce an arc of infrared light. This arc is typically between 15 and 30 degrees. Attempt to realign the devices so that they fall within this arc. Both devices should be the same height; the vertical arc is much narrower than the horizontal arc for acceptable transmission and reception.

Always look for a problem with interference. Infrared transmission is very susceptible to interference. For example, direct sunlight contains infrared light and can cause degradation of the infrared signal transmitted between devices.

If you see a message similar to the one in Figure 13.21, Wireless Link has detected a problem during a file-transfer or printing session.

Figure 13.21
Wireless Link alerts you to a break in transmission, which could be caused by stray light or physical interference with the IR signal.

If another computer with Windows Me is incapable of sending you data via the infrared port, your Wireless Link might not be configured to accept transmissions. Remember that if you decide to enable receiving of files with Wireless Link, your computer can receive files from any user with Windows Me and an infrared port.

PROBLEMS WITH DIRECT CABLE CONNECTION

I've connected my computers and run the DCC Wizard but nothing's happening.

Check the following to ensure that Direct Cable Connection will work for you.

First, ensure that you have the same network protocol established on both machines; NetBEUI is the easiest to set up. Microsoft's help for Direct Cable Connection never tells the user that this is necessary, but it's vital.

Next, make sure that one computer is the host and the other is the guest. The host should have one or more resources set to be shared with the guest computer. Sharing for DCC is accomplished the same way as with other types of network sharing. See Chapter 19, "Sharing Files, Folders, and Printers," for more information.

Next, check the cables. You must use LapLink-style file-transfer cables; serial or parallel cables designed for switchboxes or as extension cables aren't wired correctly. These cables are usually much thinner than normal parallel or serial cables because data transfer requires fewer wires than normal printing or modem tasks.

If you are connecting two notebook computers via infrared ports, both ports must be enabled before DCC can work. DCC over infrared is extremely slow.

If you are connecting as guest, know the host's computer name and password(s) used for shared resources: no password, no access!

SECRETS OF MASTERING THE WINDOWS ME ENVIRONMENT: INSTALLING PC CARDS AND COM PORT ASSIGNMENTS

Installing a communications device, such as a PC Card modem, causes Windows Me to automatically assign a communications port (COM port). This process uses the base I/O port addresses as displayed in the following list:

- COM1 at 3F8 (input/output range)
- COM2 at 2F8
- COM3 at 3E8
- COM4 at 2E8

If you are attempting to install a device that has a "nonstandard base address" or if all four of the standard ports have already been assigned, Windows Me automatically assigns the modem to the next available COM port. For example, if COM1–COM4 are already assigned, COM5 port is the next available port.

If you are running legacy 16-bit Windows 3.1 applications, those applications might not be configured to access ports higher than COM4. In this case, you must adjust the base address in Device Manager—in the System option in Control Panel—or remove other devices to free up a COM port with a lower number.

For example, if your computer has two COM ports—COM1 and COM2—and you are not using either COM port, you could go into your computer's BIOS configuration screen and disable COM2 *before* you install your PC Card modem. This enables the modem to use COM2, either automatically or by adjusting its properties through the Device Manager.

Remember, if you are using both COM1 and COM2 that COM3 and COM4 should use a different IRQ to avoid conflicts. COM3 normally shares IRQ4 with COM1, and COM4 normally shares IRQ3 with COM2. This sharing sometimes works if both COM ports on a single IRQ are not active at the same time. Here's an example of when this wouldn't work: If you are trying to use COM1 to synchronize with a Palm or other portable device through its docking cradle while you're using COM3 to download pictures from a low-end digital camera, you're likely to have a system lockup, possibly causing the loss of data going to your Palm or coming from your digital camera.

Another interesting issue develops if you are running devices that are not Plug and Play compliant. You might have to change the resource settings for their communications ports. This step can be performed through the Device Manager.

To view the current assignments for a serial port or a modem, open the Device Manager. You can access the Device Manager through the System icon of the Control Panel, or you can right-click My Computer and select Properties. In either case, you would then click the Device Manager tab to view the current hardware configuration.

If your serial port conflicts with another device, you will usually see a yellow ! sign indicating a conflict next to one or both devices. To learn the details of a conflict with your serial ports, follow these steps:

1. Click the plus sign (+) next to Ports (COM and LPT) to see the serial (COM) ports installed on your system.
2. Click a port and select Properties to see its current IRQ and other hardware resource settings.
3. The Conflicting Device List at the bottom of the Resources screen indicates which device is conflicting with your serial port, and how it conflicts.

To resolve the conflict, try to adjust the other device's IRQ or other setting if possible. If not, you will need to adjust the serial port. On some systems, if you try to adjust the serial port IRQ, you might need to rerun the BIOS configuration program at powerup to choose settings to match the choices you make in Windows.

If you try to change the settings for either the serial port or a conflicting device, turn off the Use Automatic Settings option on the Resources screen. Then, either try a different basic configuration or directly change the IRQ or other resource if you can. You might need to restart your computer after making changes.

For more information about using the Device Manager to manage your hardware, see Chapter 12, "Configuring Hardware and Device Drivers."

CHAPTER 17

WINDOWS NETWORKING 101

In this chapter

UNDERSTANDING WINDOWS NETWORKS

What is a network and why create one? A network consists of the hardware and software components necessary for two or more computers to communicate. Businesses have long been aware of the advantages of networking:

- Monetary savings from sharing expensive printers and other devices
- Fast access to information
- Easier information management
- Shared access to information
- Better communications
- Improved efficiency

Thanks to the improvements in networking setup featured in Windows Me and the rise of low-cost, high-performance traditional and home-oriented network hardware, you can enjoy the benefits of networking both at home and at the office.

WHAT YOU NEED TO CREATE A NETWORK

A network consists of two types of components: hardware and software. The *hardware* components consist of various pieces of equipment that connect the computers. At a minimum, the hardware necessary to allow computers to communicate includes cables and adapter cards. Windows Me can work with any type of network hardware, including traditional Ethernet, Fast Ethernet, and newcomers such as wireless and phone-line networking. The *software* required to communicate across a network includes the network operating system, a network client, and a protocol.

Windows Me functions as a networking operating system, as well as a desktop operating system. A network client enables your computer to communicate with another computer based on the type of network operating system it is using. A *protocol* can be thought of as the language spoken across your network. If two computers use different protocols, they cannot communicate.

Windows Me can connect easily with other recent and current versions of Windows, and also with non-Windows operating systems.

HOW PEER-TO-PEER NETWORKS WORK

Networks can be organized either as peer-to-peer or server-based. In a peer-to-peer network, each computer acts as both a server and a client. One system has the dual capability to act as a server and to share—or provide—resources and to connect to server-side components as a client to access resources. All information is stored on each computer. When a

computer is playing the server role, it provides access to files contained on its local hard drive and on peripherals attached to the computer (such as printers, fax modems, scanners, and CD-ROM drives).

Each computer can share its resources without the need for centralized administration of these resources. Each user in a peer-to-peer network can be an administrator of that computer's resources. This approach alleviates the need for one person to be responsible for various network administrative tasks.

In a server-based network, on the other hand, one or more servers provide a centralized user database, centralized data (and sometimes application) storage, and centralized control of shared resources.

Peer-to-peer networks are far less secure and run much more slowly than server-based networks, but are easier to set up, require no special hardware, and are very suitable for up to about 10 users.

Server-based networks, on the other hand, provide far greater security, control, and performance than peer-to-peer networks, but require more expensive hardware and a much higher degree of technical expertise. In return, though, server-based networks can be scaled to handle the needs of hundreds or thousands of users.

Windows Me can be used as a peer server, a peer client, and a client on a small business network. The networking capabilities built into Windows Me make it an excellent option for implementing a peer-to-peer network. As an operating system, it contains all the elements you need to enable access to local resources or to access resources located on other computers in the network. This native networking capability enables the easy sharing of local resources and access to remote resources.

Windows Me has a point-and-click interface that enables you to browse the network to locate and access available resources. The same easy-to-use interface makes the sharing of resources extremely easy for the user. This interface alleviates the need for the user to be technically adept at network administration while still providing access to network resources.

Home networks and small-office networks are almost always peer-to-peer networks, making sharing printers and drives with co-workers or family members easy. Keeping your home network secure can be more difficult, though, than with a server-based network.

PLANNING YOUR HOME NETWORK

Planning a home network is easier in many ways than planning a corporate network. The list of resources you need to share is short, the number of computers you must connect together is small, and the computers are usually all running the same or similar versions of Windows. So, do you need to plan your home network? Absolutely. Here's why:

■ **You need to have a plan for where to store family documents**—If you store documents on whatever computer you're using, you'll have budgets, letters, email, and all the rest scattered across two or three computers, making backups a big problem.

■ **You must decide what kind of network hardware to use**—The popularity of Fast Ethernet hardware makes it the lowest-cost-per-user network around by a wide margin, but the problems of running new wiring might lead you to consider other forms of networking that don't involve rewiring.

■ **You need to decide which computer will perform which task(s)**—The typical model of putting a shared Internet connection, shared drive, and shared printer on a single computer can suck the performance of both the sharing computer and the rest of the network down and also make recovering from the inevitable system failure harder. Instead, consider placing a shared printer on one computer, a shared drive on another, and *not* sharing the drive on the computer with the shared Internet connection.

So, here are the questions you must answer *before* you buy your first piece of network gear:

■ How many computers will you have on the network?

■ Can you use existing wiring, or will you need to add wiring?

■ Are you planning to share your Internet connection?

■ What types of data files do you want to share, and where do you want to store them?

The following questions can be answered later if you find that your existing hardware isn't suitable for your home network:

■ **Can you share your existing printer(s)?**—A few very low-cost printers aren't designed to be networked. If you have problems using a printer across the network, check with the printer vendor.

■ **Will you need to add RAM or make other upgrades to any of your computers?**—Many computers sold for home use include only 32MB of RAM. 64MB or more provides better performance. On a computer that will share its Internet connection with others, I'd recommend 128MB of RAM to avoid slowdowns.

Use the answers to these questions to plan your network. Items that you need to plan include its topology, what equipment you will use to connect the computers on your network, and which upgrades your existing computers will require to run as well as possible on the network.

> **Note**
>
> Topology refers to the layout of the network: how computers are physically and logically connected to one another. As you read the rest of this chapter, the meaning of *topology* will become clearer to you.

NETWORK WIRING AND HARDWARE

Before you can install any network hardware in your home computers, you must decide how they will be connected to each other. Today, your choices include the following:

- 10BASE-T Ethernet
- 100BASE-TX Fast Ethernet
- Home PNA 1.0 and 2.0
- Wireless
- Infrared

The network connection you choose will determine

- Which types of network cards you must install in each computer
- Whether you must run new cable to connect your computers to each other
- The speed of your network

The following sections provide a brief description of the network hardware choices you have with Windows Me.

10BASE-T ETHERNET

The least expensive network hardware choice is 10BASE-T Ethernet, which runs at 10Mbps (Mbps=megabits per second).

10BASE-T Ethernet uses a type of cabling called *unshielded twisted-pair (UTP)*, which connects between a network card installed in each computer and a central hub, which directs information between each network card. UTP cabling resembles telephone wire, but has four wire pairs (a total of eight wires) inside. 10BASE-T Ethernet requires either Category 3 or Category 5 UTP cabling. See Figure 17.1 for examples of UTP cables, and Figure 17.2 for an example of an RJ-45 port.

Figure 17.1
Typical UTP cables for use with 10BASE-T and Fast Ethernet 10/100 network cards.

Top view of the cable, showing the twisted-pairs within the RJ-45M connectors

The twisted-pair wires (4 pairs)

Side view of a "snagless" cable; the boot prevents the plastic locking handle from being bent or broken off

The boot on the snagless cable
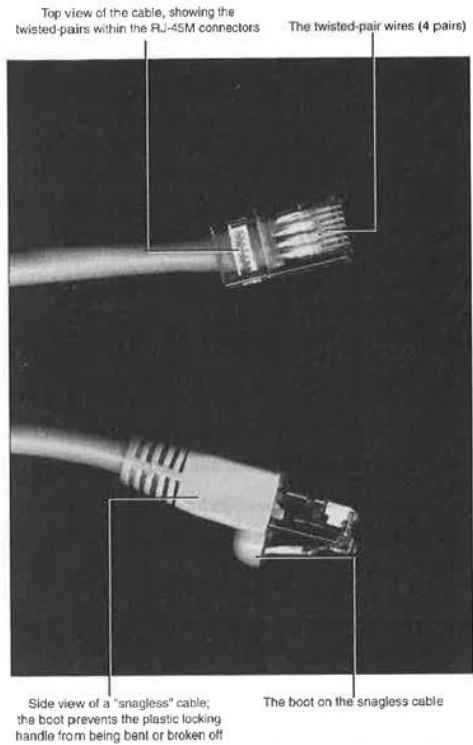
Figure 17.2
An RJ-45 port.
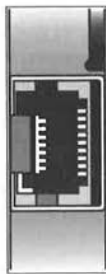
The hub is powered (it plugs into a standard 115v wall outlet), and it acts as a receiver and transmitter of signals between all the computers attached to it. See Figure 17.3 for an example.

Figure 17.3
A typical
10BASE-T hub.

The Uplink port allows the
hub to be connected to
another hub with a standard cable

Rear view of hub

RJ-45 ports for UPT cable

Power connector

Uplink   5   4   3   2   1   7.5VDC/400-700mA

LINKSYS
5-Port Workgroup Hub

Yellow lights indicate
network traffic

Red light blinks
when data from
two computers collides

Top view of hub

Green lights indicate
connections with
network cards

Solitary green
light indicates power

10BASE-T Ethernet networks have a *star* topology, because the central point (the *hub*) has network cables extending from it in various directions to the computers on the network (see Figure 17.4).

Although 10BASE-T Ethernet hardware is still on the market, much faster performance at only a small premium in cost is available with its newer sibling, Fast Ethernet.

Figure 17.4
A typical star topology: four computers connected via 10BASE-T Ethernet cards and UTP cables through a hub.

Star
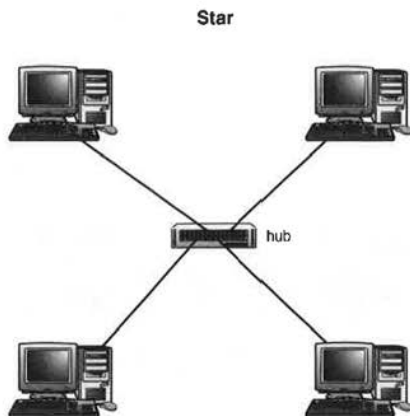
100BASE-TX FAST ETHERNET

Fast Ethernet resembles 10BASE-T Ethernet, with the following differences: Fast Ethernet runs at 100Mbps and requires Category 5 or better UTP cabling.

Fast Ethernet can use either a hub or a switch to connect computers, and has the same star topology as 10BASE-T Ethernet. A switch resembles a hub, but allocates the entire 10Mbps or 100Mbps speed of the network cards connected to it (bandwidth) to each pair of computers connected to each other at any one time. A hub, on the other hand, must divide the bandwidth among all the network cards connected to it.

Most Fast Ethernet hardware actually supports both 100BASE-TX Fast Ethernet and the older 10BASE-T Ethernet standards, enabling you to intermingle Fast Ethernet and 10BASE-T Ethernet on the same network.

With either Fast Ethernet or 10BASE-T Ethernet, you will need to run new wiring in most cases unless your home was prewired for networking with Category 5 UTP cabling.

⚠ *If you have problems with Ethernet or Fast Ethernet hardware, see "Common Ethernet Hardware Problems" in the "Troubleshooting" section at the end of this chapter.*

HOME PNA

If you're concerned about the hassle of rewiring your home for networking, you might be able to reuse your existing network of telephone wire by connecting your computers with Home Phone Networking Alliance (PNA) network devices.

Home PNA comes in two forms:

■ Home PNA 1.0 runs at 1Mbps and can be connected to a computer through your choice of internal cards or external parallel or USB ports.

■ Home PNA 2.0 runs at 10Mbps, the same speed as 10BASE-T Ethernet, but cannot connect through parallel ports, because parallel ports are too slow to support the 10Mbps speed.

Home PNA uses a bus topology, in which the various computers are connected directly to each other instead of a central hub. See Figure 17.5 for an example of a Home PNA 2.0 network using external USB devices. Home PNA 2.0 and 1.0 devices can be interconnected.

Figure 17.5
Home PNA networks, like this one, use a bus topology; no hub is needed.

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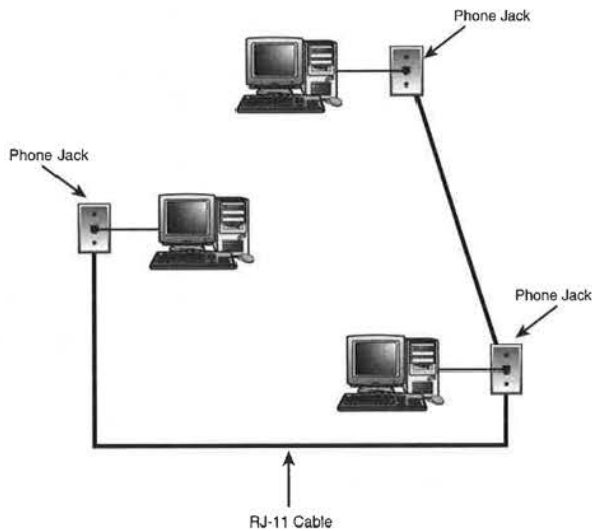
WIRELESS NETWORKS

If you don't want to worry about any kind of cabling and relish the thought of curling up anywhere you want with a hot notebook computer and a cold glass to get your work done, a wireless network that connects computers via radio waves might be what you'd prefer.

The major standards for wireless networking include

■ Home RF, a 1.6Mbps standard supported by the Home RF Working Group. Home RF uses a point-to-point connection scheme, in which each computer relays messages directly to other networked computers.

■ Wireless Ethernet IEEE 802.11b, running at 11Mbps

■ RadioLAN Mobilink, running at 10Mbps

The last two wireless networks resemble standard Ethernet networking's star topology in their use of a central access point for receiving and sending messages between computers. Unlike standard Ethernet networks, though, the cost of the wireless network cards and access points used by both Wireless Ethernet IEEE 802.11b and RadioLAN bring the cost per user into the $500+ range, which is far too expensive for most home users.

WIRELESS NETWORKING HARDWARE

With any form of wireless networking, you must buy network adapters designed for the wireless network standard you're using. These adapters attach to the PCI slots inside recent desktop computers, the ISA slots in older computers, or PC Card slots used on notebook computers. Wireless adapters are usually configured via the Plug and Play technology used by Windows Me, but can be distinguished from ordinary network adapters by the antennas protruding from the adapters.

If you choose Wireless Ethernet IEEE 802.11b, you will also need at least one access point—a small, bookend-size radio transmitter/receiver that can stand alone or be connected to a standard 10BASE-T Ethernet network. The access point relays data between stations and enables the wireless network to interconnect with a standard 10BASE-T Ethernet network. At home, one access point is adequate to enable roaming, but larger buildings require multiple access points for roaming because of distance limitations and interference.

The RadioLAN Mobilink wireless network also uses access points to connect wireless nodes to each other, but a separate device called a BackboneLINK bridge is required to interconnect a RadioLAN Mobilink network with a conventional Ethernet network. As with IEEE 802.11b wireless networks, one access point is adequate to enable roaming at home, but larger buildings require multiple access points.

Home RF network adapters connect directly to each other via radio waves; no access point device is necessary. A cordless Ethernet bridge is available to interconnect a Home RF wireless network with a wired Ethernet network.

INFRARED NETWORKING

The only infrared network currently available for Windows Me users is the slow infrared port connections available through Direct Cable Connection or Wireless Link. The forthcoming Bluetooth infrared network will run at 400Kbps, but no computing products using this protocol are available at the time of this writing.

→ To learn more about Direct Cable Connection and Wireless Link, **see** Chapter 13, "Using Windows on a Notebook Computer," **p. 310**

Infrared networking with Windows Me is limited to direct connection with another computer via either Direct Cable Connection (using the IRDA port on most notebook computers as a serial port) or file transfers only with Wireless Link.

Direct Cable Connection requires that you use the same port type on both your Windows Me computer and the other Windows Me/9x computer to which you are trying to connect. Direct Cable Connection can also be performed with wired serial or parallel ports. Parallel ports, however, are recommended for the best performance.

The forthcoming Bluetooth high-speed infrared standard will be supported by Windows-compatible devices starting in early 2001.

Tip from

EQ

Whether you choose a form of Ethernet, Home PNA, or some type of wireless networking, you can buy either preassembled "boxed network" kits that contain the hardware necessary to connect two or more computers or purchase the components you need separately. As long as the components you purchase meet the standards of the network you are using, you can mix and match brands and models of equipment as you desire.

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NETWORK ADAPTERS

Regardless of the network you choose, you will need to install at least one network adapter (also called a Network Interface Card, or NIC) per computer on your network.

→ If you want to share some forms of high-speed Internet access, you must install two network cards into the computer with the shared Internet connection. To learn more about sharing your Internet connection, **see** Chapter 20, "Sharing an Internet Connection," **p. 495**

Network adapters come in the following forms:

- **ISA or PCI expansion cards**—These are used in desktop computers.
- **USB devices**—These can be used with either recent-model desktop or notebook computers running Windows 98, Windows 2000, or Windows Me.
- **Parallel-port devices**—These can be used with any computer containing a parallel port, but they don't support high-speed connections.
- **PC Cards**—These are used in notebook computers.

See Figure 17.6 for examples. Each network adapter must be physically installed or attached to the computer, but cannot function until it is configured by the operating system with drivers and has one or more network protocols bound (logically attached) to it.

Figure 17.6
Typical network cards
and devices (photos
courtesy Linksys, Inc.).

ISA Ethernet 10BaseT
network card

PCI Fast Ethernet
10/100BaseTX
network card

PCMCIA Fast Ethernet
10/100 PC Card

Category 5
UTP cable

Dongle for connecting
PC Card to
Category 5 cable

Home PNA USB
external network
device
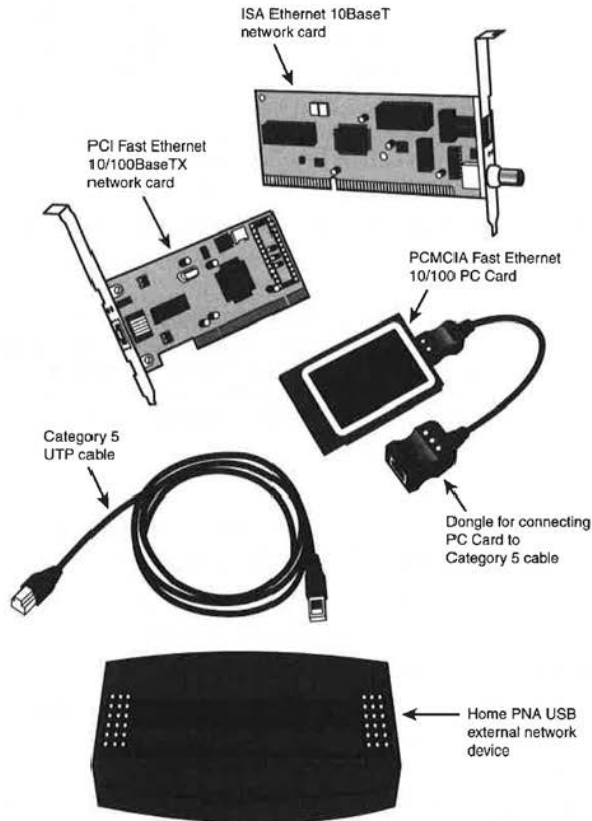
Most network adapters for use with Windows Me use the Plug and Play technology
employed by Windows Me and most other recent Windows versions for easy configuration.

→

CABLING

Unless you choose a wireless or infrared network solution, you will need to connect your
network cards with cable.

Home PNA network cards must be connected to telephone jacks with standard "silver
satin" telephone cable. You should use the shortest length of telephone cable available;
spare cables provided with modems work well.

10BASE-T or Fast Ethernet network cards require UTP cables to run between them and the hub or switch that connects them. Both types of Ethernet networks can use Category 5 UTP cables (Fast Ethernet requires Category 5), and you can either purchase prebuilt cables or make your own.

DECIDING WHETHER TO BUY OR MAKE YOUR OWN CATEGORY 5 CABLES

Making your own Ethernet cables makes sense if you are planning to run cable between different rooms in your home. The benefits of making your own cables include the following:

- Correct cable lengths are easier to judge.
- Cables without connectors can be run between rooms and floors far more easily than cables with connectors already attached.
- Lower cost than with prebuilt cables, which might also be hard to find at retail in lengths beyond 25 feet.

The benefits of buying prebuilt cables include

- No assembly required; just open the package and plug the cable in.
- Choosing a different colored cable for each computer makes troubleshooting easier.

If you decide that you want to build your own Ethernet cables, you will need the following items:

- A spool of Category 5 (Cat 5) bulk cable
- RJ-45 connectors
- An RJ-45 crimping tool (with wire stripper)

Note

You can learn more about making your Ethernet cables by reading Chapter 19 of Scott Mueller's *Upgrading and Repairing PCs, 12th Edition*. An excellent online tutorial for the process is available at

`http://www.duxcw.com/digest/Howto/network/cable/`

HUBS AND SWITCHES

10BASE-T and Fast Ethernet cards are designed to connect to either a hub or a switch rather than directly to each other.

Note

If you are connecting only two computers together, you can purchase a special type of Category 5 cable known as a *crossover* cable. A crossover cable reverses the normal position of some of the wires at one end, enabling the cable to be used to connect two computers directly to each other. However, given the low price of hubs today, using a hub, even for a two-station network, is a better choice for most users because it allows the network to be expanded later.

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Hubs and switches look similar to each other, but have some fundamental differences—the key difference being that switches enable better performance. Both hubs and switches have multiple RJ-45 connectors (meaning that you can connect several computers and printers using one hub or switch). A connector labeled "uplink" is designed to connect a hub or switch to another hub or switch, enabling you to add more users to your network. The other connectors are used to connect cables running from network adapters.

Hubs and switches are powered. The low-cost units sold for home and home-office/small-office uses normally use a briquette-size AC adapter that plugs into a standard wall socket for power.

Hubs and switches have signal lights that indicate which connectors are in use, which connectors are handling network traffic, and other information. Hubs also use signal lights to indicate when collisions between data streams take place, whereas switches, which establish a direct connection between two computers, indicate whether the connection is to a 10BASE-T or Fast Ethernet network adapter.

Hub or switch: Which should you choose? Until recently, the price of switches made this choice prohibitive for the small-office/home/home-office market, but several vendors have introduced switches that can handle up to 5 computers for prices under $100. From the standpoint of performance, switches are far better than hubs. A Fast Ethernet hub divides the 100Mbps speed among the computers connected: If 4 computers are connected, the effective speed of the network is just 25Mbps (100Mbps/4). Switches enable a full-speed connection between any 2 computers on the network and support the full speed of the network. I recommend using switches over hubs for better performance, and you can now buy "boxed network" Fast Ethernet kits that include either switches or hubs.

TCP/IP DEMYSTIFIED

Windows Me supports three major network protocols:

- **NetBEUI**—Primarily used for networking between Windows computers and for Direct Cable Connection
- **IPX/SPX**—Used to connect to Novell NetWare 3.x and 4.x servers
- **TCP/IP**—Used to connect to the Internet and for general-purpose networking

Each computer on a network must use the same protocol to connect with other computers, and the clear favorite today is TCP/IP (Transmission Control Protocol/Internet Protocol). TCP/IP, unlike the other protocols supported by Windows Me, can connect computers in the same house or office to each other and to computers halfway across the world.

As you might expect, the flexibility of TCP/IP also makes it the most complex network protocol to use. Incorrect TCP/IP settings can keep your computer from connecting with any other computer, either at home or around the world.

⚠ *If you have TCP/IP configuration problems, see "Common TCP/IP Problems" in the "Troubleshooting" section at the end of this chapter.*

WHAT IS TCP/IP?

TCP/IP is the language of the Internet. By installing TCP/IP and configuring it properly to connect with the Internet, your Windows Me computer can connect to any other computer reachable via the Internet, regardless of its operating system.

The *TCP* in TCP/IP handles the transformation of a message into small packets of data that can be transmitted through a network (or series of networks) to the receiving computer, which uses its own TCP installation to reassemble the message into its original form. The *IP* portion of TCP/IP handles the addressing of the packets, ensuring that they reach the correct destination, whether it's a computer around the corner or around the world. Gateways are used to connect individual or networked computers to the rest of the Internet, and IP sends your message to the appropriate gateway, which forwards it to the gateway next in line on your message's way to its destination.

Because TCP/IP is stateless, with each new page request treated as a new event, it enables your computer to download several files at the same time while you are surfing to a new Web site.

To connect with other computers via TCP/IP, you must install the TCP/IP protocol included with Windows Me, have a way to connect to other computers (modem or network adapter), and have a correctly configured IP address.

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HOW IP ADDRESSES WORK

IP addresses come in the form *xxx.xxx.xxx.xxx*, with each *xxx* standing for a number 0–255. For example, the IP address assigned to the network adapter that connects an Internet Connection Sharing (ICS) computer to the rest of the home network is 192.168.0.1. Because this address connects with a private network (not the Internet itself), no conflicts occur with the many other Windows 98 or Me computers used for ICS.

Each computer in a given TCP/IP-based network must have a unique IP address. On a home network, IP addresses come from two sources: If you are connecting to the Internet, your Internet service provider (ISP) assigns you an IP address or provides you with the correct settings to obtain an IP address whenever you connect. Other computers that will share the Internet connection on the home network normally use the automatic IP configuration—Dynamic Host Configuration Protocol (DHCP)—setting to obtain an IP address.

Your computer must have a valid IP address to connect with other computers via TCP/IP. In the previous example, the computer using ICS to share its Internet connection with other computers actually has *two* IP addresses; the other IP address (not shown) must be unique, because it connects the computer to the Internet.

USING TCP/IP ON A PRIVATE NETWORK

On private networks (LANs that do not access the Internet), you can configure your computers with any IP addresses you want. To make the configuration of private networks easier, Windows Me can use Automatic IP Addressing, which automatically assigns a TCP/IP address to each host on the network when a DHCP server is not available.

Windows Me Automatic IP Addressing uses IP network number 169.254.$x.x$, where the first two octets (169.254) are fixed and the last two octets are uniquely assigned to each Windows Me computer in your network.

> **Caution**
>
> Nodes using Automatic IP Addressing can communicate with only their private network and cannot be seen or reached from the Internet.
>
> If you must communicate with the Internet, you cannot use Automatic IP Addressing unless your network uses a proxy server to provide a connection to the Internet.
>
> A *proxy server* is a computer that can be used to route Internet or other networking traffic to other computers. It can also be used to provide security features such as firewalls or antivirus scanning to the computers connected to it.

DHCP is a method used by Windows to assign IP addresses, as necessary, to computers connecting to the Internet. A computer that assigns IP addresses to other computers is referred to as a *DHCP server*. When a DHCP server is available, such as when the Home Networking Wizard is used to set up the network with Internet Connection Sharing, Windows Me computers act as normal DHCP clients and use the dynamically assigned IP address they receive via the DHCP process.

To enable Automatic IP Addressing, follow these steps:

1. In the Control Panel, open the Network icon.
2. Click the Configuration tab.
3. Select the TCP/IP → Network Adapter listing.
4. Click the Properties button.
5. Click the Obtain an IP Address Automatically checkbox (see Figure 17.7).

UNDERSTANDING YOUR TCP/IP CONFIGURATION OPTIONS

Depending on how you will use TCP/IP, your TCP/IP configuration might be very simple or very complex. Generally, you will need to make changes to the default Windows Me configuration primarily for the computer that will connect with the Internet.

→ To learn how to install the TCP/IP protocol in Windows Me, **see** the section "Installing and Configuring Network Protocols" in Chapter 18, "Setting Up a Home Network," **p. 454**

Figure 17.7
TCP/IP addressing in
My Network Places.
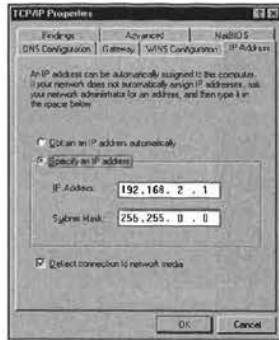
You might need to adjust the TCP/IP configuration when you do any of the following:

- Install a network adapter to connect your computer to a high-speed Internet connection, such as a cable modem or DSL line.
- Change ISPs.
- Move a notebook computer from the office to home if both your office and home networks use the TCP/IP protocol.
- Install a modem for use with a dial-up Internet connection.

If you access the Internet with a dial-up modem, you adjust your TCP/IP configuration in the Dial-Up Networking connection icon used to call your ISP.

On the other hand, if you access the Internet through a network card that connects directly to the Internet via a cable modem or DSL line, you adjust the TCP/IP properties through the Network icon in the Control Panel or the properties for My Network Places.

To view the TCP/IP properties for your network card, do the following with Windows Me:

1. Right-click My Network Places and select Properties from the menu, or open the Network icon in the Control Panel.

2. Scroll down the list of components and highlight a listing that looks similar to this:

   TCP/IP->(your network card name)

   You'll also see TCP/IP->Dial-Up Adapter and TCP/IP->Dial-Up Adapter #2 (VPN Support). Ignore these.

3. Click the Properties button (see Figure 17.8).

Figure 17.8
You must select the
TCP/IP->network card
combination before
you can view its prop-
erties.
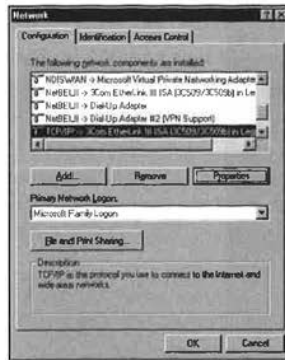
TCP/IP PROPERTIES FOR YOUR NETWORK CARD

The TCP/IP properties for your network card, regardless of brand, are divided into the
following categories, each of which is a tab on the Properties sheet. (Each of these is dis-
cussed in more detail immediately following this section):

- IP Address
- WINS Configuration
- Gateway
- DNS Configuration
- NetBIOS
- Bindings
- Advanced

Setup programs provided by many ISPs and the Home Networking Wizard provided with
Windows Me can automatically configure these options for you, but because they can be
changed so easily, viewing and recording your configuration is useful in case your network
has problems later.

The TCP/IP properties for a computer that provides a shared Internet connection with
two network cards are stored in the following options in the Network properties sheet (see
Figure 17.9):

- **TCP/IP->Internet Connection Sharing**—Stores the settings that connect the com-
  puter with the Internet; these settings are those provided by your ISP or office network
  administrator
- **TCP/IP->(Home – your network card)**—Stores the settings that connect the com-
  puter with the rest of the home network

■ **TCP/IP->(Shared – your network card)**—Stores the settings for the network card that connects to ICS

Figure 17.9
TCP/IP components for a computer sharing its Internet connection with the Home Networking Wizard and Internet Connection Sharing.

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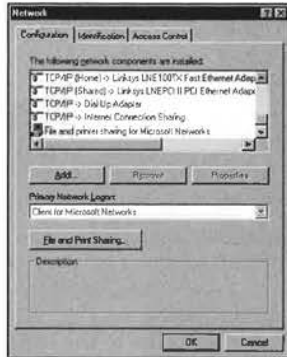
Caution

I encourage you to look through the TCP/IP properties for your network card, but be careful when you do so.

Don't click OK when you finish looking at your TCP/IP properties. If you accidentally made any changes, they're saved to your Windows configuration and you might not be able to get back on the Internet. Instead, use Cancel to discard any changes you made by mistake and exit the Network menu.

IP ADDRESS SETTINGS

Two choices are available here:

■ Use Obtain an IP Address Automatically if the IP address changes whenever you log on to the Internet; this is the appropriate setting for computers that access the Internet through Windows Me's ICS (see Figure 17.10).

■ If you have been given a specific IP address and subnet mask by your ISP, enter them. When you set up ICS on the computer that will share its Internet connection with others, the IP address provided by the ISP will be transferred to the TCP/IP→Internet Connection Sharing component in Networks. The ICS setup program will also set the IP address for the network card (Shared) that connects to the Internet to 192.168.0.1.

Figure 17.10
If your ISP uses dynamic IP addressing, as in cases where your computer is connected to the Internet via ICS, the IP address and subnet mask are blanked out, as shown here.
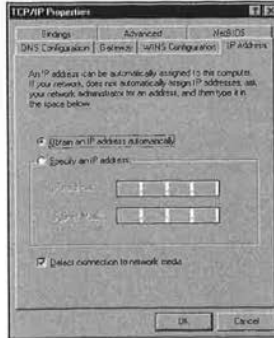
WINS CONFIGURATION

You will normally select either Disable WINS Resolution or Use DHCP for WINS Resolution on this screen, depending on what your ISP specifies. The spaces for inserting an IP address are normally used with corporate networks that have Windows NT or Windows 2000 servers. WINS Resolution and DHCP are two different methods for providing your computer with a dynamic IP address (see Figure 17.11). These options are normally used in corporate networks with dedicated servers.

Figure 17.11
This computer doesn't use either WINS Resolution or DHCP.

On computers that connect to the Internet via the ICS feature of Home Networking, you choose to Disable WINS Resolution but don't select DHCP. The computer with the shared Internet connection automatically provides an IP address without any special settings on this screen.

GATEWAY

If you're connected to another computer that provides you with Internet access, such as with Windows ICS, or to a router, you must enter the IP address of the computer or router acting as a gateway. Otherwise, the fields on the Gateway screen are usually left blank (see Figure 17.12).

Figure 17.12
This computer is connected through a gateway. If it were connected directly to the Internet, no IP addresses would be listed.
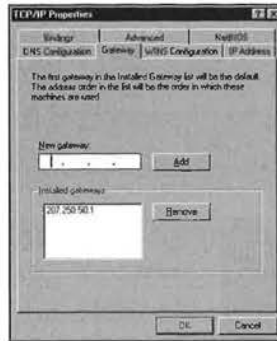
DNS CONFIGURATION

DNS is short for Domain Name System. Enabling DNS tells the computer where to check IP addresses against URLs on Web pages.

When you enable DNS, you also must insert one or more DNS servers' IP addresses (see Figure 17.13).

You might also need to enter the name of a domain suffix server, a host, and a domain.

Figure 17.13
This computer can check two name-servers for DNS information.

On computers that use ICS to access the Internet, the DNS server is the same IP address as the ICS host, normally 192.168.0.1.

NETBIOS

If your network uses NetBEUI (an enhanced form of the NetBIOS protocol) to connect with other computers on your home network, you will see the box labeled I Want to Enable NetBIOS over TCP/IP selected (see Figure 17.14).

Unfortunately, if NetBIOS over TCP/IP is enabled on a computer that connects directly to the Internet, your computer can be hacked by other Internet users, possibly compromising information on your computer.

Tip from

EQ

To unbind NetBIOS from TCP/IP to help improve the security of any shared folders on the computer with direct Internet access, see the discussion available at the Gibson Research Web site:

http://grc.com/su-bondage.htm

Figure 17.14
Microsoft enables NetBIOS over TCP/IP, but this default enables shared folders to be visible over the Internet if File and Print sharing is also enabled.
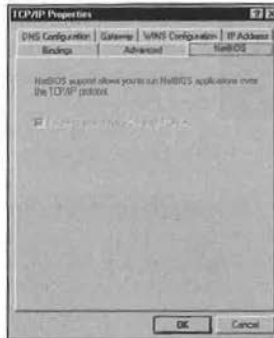
BINDINGS

This tab lists the network components that use TCP/IP (see Figure 17.15). If File and Print Sharing is listed here, you might be exposing your shared folders to everyone on the Internet! See the Gibson Research Web site listed previously to learn how to disable this feature.

ADVANCED

You normally won't need to make any adjustments here.

If you change anything, Windows Me installs the necessary files and prompts you to reboot your system.

Use the following worksheet to record your TCP/IP settings. You should record the special settings provided by your ISP because settings used by the Home Networking Wizard and ICS are standard.

Figure 17.15
If File and Print Sharing is installed, Windows Me binds it to TCP/IP when you install TCP/IP, even if you are using NetBEUI to connect to the rest of the computers on your network.
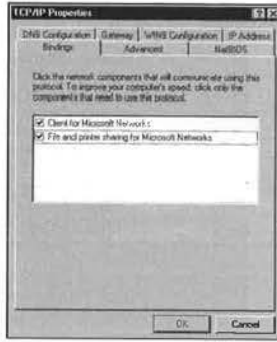
TABLE 17.1 TCP/IP SETTINGS FOR YOUR INTERNET CONNECTION VIA A NETWORK CARD

Tab/Field	Values	Notes/Instructions
General		
IP Address	___.___.___.___	If Yes, leave fields at left blank
Subnet Mask	___.___.___.___	
Automatically Assigned	( ) Yes	
WINS Configuration		
Enable/Disable WINS Resolution	(_) Enable (_) Disable	If Enable, add one or more WINS Servers
WINS Server	___.___.___.___ ___.___.___.___ ___.___.___.___	Complete IP address field; then click Add button for each server
Scope ID		Enter the same value to restrict NetBIOS traffic to only those computers with same ID
Use DHCP for WINS Resolution	(_) Yes	Can be selected only if DHCP server has been detected
Gateway		
Insert Gateways	___.___.___.___ ___.___.___.___ ___.___.___.___	Complete IP address field; then click Add button for each server
DNS Configuration		
Enable/Disable DNS	(_) Enable (_) Disable	If Enable, complete remainder of fields
Host		Enter name as specified by ISP

TABLE 17.1 CONTINUED

Tab/Field	Values	Notes/Instructions
Domain		Enter name as specified by ISP
DNS Server Search Order	_._._._ _._._._ _._._._	Complete IP address field; then click Add button for each server
Domain Suffix Search Order		Complete name field; then click Add button for each server
NetBIOS		
Enable NetBIOS over TCP/IP	(_) Enable	Can't be selected without special configuration; see Chapter 19.
Advanced	*(varies, can be skipped)*	
Bindings	(specifies bindings— network components—that will use this protocol)	

TCP/IP PROPERTIES FOR ANALOG MODEM USERS

If you use an analog modem, follow these steps to view your connection's TCP/IP Properties with Windows Me:

1. Open the Dial-Up Networking folder, which can be accessed from the Windows Explorer, the Control Panel, or through clicking Start, Programs, Accessories, Communications.
2. Locate the icon for your dial-up connection to your ISP.
3. Right-click the icon and select Properties from the menu.
4. Click the Networking tab.
5. Click the TCP/IP Settings button.

As with the network card's TCP/IP properties sheet, any errors in the TCP/IP setup will prevent you from accessing the Internet (see Figure 17.16).

TCP/IP PROPERTIES FOR YOUR MODEM

The properties you can set for your modem are as follows:

- Its IP address (either server-assigned or a specified value)
- Name server addresses for DNS and WINS servers (either server-assigned or specified values)
- Use IP Header Compression
- Use Default Gateway on Remote Network

You should also record these settings in case they are altered.

Figure 17.16
An example of TCP/IP settings for a dial-up connection. Note that the server provides the IP address, but the nameserver values are specified. Some ISPs don't require a name-server.
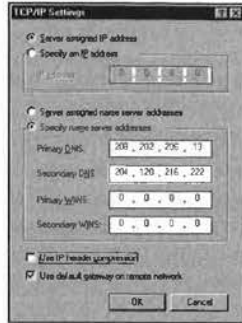
AN OVERVIEW OF WINDOWS SECURITY FEATURES

Windows Me, similar to Windows 9x, is designed to provide maximum user flexibility by design, with security a less-important consideration. In a corporate network environment, you can use a Microsoft Windows NT, Windows 2000, or Novell NetWare server to authenticate network users before they can access your computer or any shared resources. However, home and small-office users must use other methods to prevent access.

Windows Me has some built-in security features that can be used to help keep information safe, including

- Passwords for shared resources
- User profiles
- Internet Explorer security zones
- Remote Administration

→ Passwords for shared resources, user profiles, and Remote Administration are discussed later in this chapter. To learn more about Internet Explorer's security features, **see** Chapter 23, "Keeping Your Internet Connection Secure," **p. 569**

However, for maximum security, Windows Me's built-in security features must be supplemented by third-party programs to help stop hack attacks, viruses, Trojan Horses, and other types of unauthorized access.

HOW HACK ATTACKS WORK

The term *hacker*, for some, conjures up a type of cyber-heroism: an image of a brave man or woman exploring the uncharted territories of cyberspace. But, for most of us, *hacker* describes those who go a step beyond exploring to deface the cyber-landscape with the digital graffiti of system violations, stolen information, and computer viruses.

Hack attacks can target any computer on the Internet that exposes shared resources to the Internet. This problem is very common on home networks, where the computer used to

access the Internet often also has File and Print Sharing enabled and has one or more folders set for sharing.

Setting passwords on your folders can stop casual snooping, such as what nosy neighbors on a shared-media cable modem Internet connection might perform. But, determined hackers use password-cracking programs to bypass password-protected shared folders.

Even if you don't have shared folders, your system can still be compromised because of how the TCP/IP protocol works. Thousands of ports (logical "doorways") are built into the protocol for performing tasks. Serious hackers use programs called *port scanners* to look for open ports on systems connected to the Internet. After open ports are detected on a given system, a Trojan Horse, remote-control, or virus program can be sent to your computer and installed. After they're installed, such programs can open additional ports and start sending data back to their creators, deleting files, changing file associations, or some combination of these harmful activities.

For a frightening look at how (and how often!) port scanners and password crackers attack your system, see the "Shields Up!" portion of the Gibson Research Corporation Web site:

http://grc.com/su-danger.htm

This site can also safely test your computer for TCP/IP port and other Internet vulnerabilities.

PREVENTING VIRUSES AND TROJAN HORSES

Viruses and Trojan Horses are similar in their malevolent effects: Except for a few benign examples, they destroy or damage data and also can send information from your system to their creators. The major difference is that viruses self-replicate, spreading themselves from one computer to another, whereas Trojan Horses depend on your "wheeling" the file with the hidden destructive payload into your system from your email folder or another source.

To keep your system safe, you must stop both types of harmful files from getting to your system. Putting a stop to harmful files requires the following tools, neither of which is included with Windows Me:

- Antivirus programs
- Common sense

ANTIVIRUS PROGRAMS AND COMMON SENSE

Even if you never use the Internet, you must install an up-to-date antivirus program and keep it up to date. Why is it so important to keep it up to date? Just ask the many corporate help-desk types who watched helplessly earlier this year while "ILOVEYOU" sent email servers and desktop computers around the world into digital unconsciousness.

Some of the unlucky victims of "ILOVEYOU" didn't have any antivirus software installed. Others had programs that hadn't yet been "taught" about the dangers of the simple Visual Basic script that trashed those computers. Those who updated their software with new antivirus data files developed after the world heard about the dangers of "ILOVEYOU" were safe—temporarily. While viruses and Trojan Horses are using the Internet as their favored mode of infection, your system can still be infected by disks and CD-ROMs carrying boot-sector or infected-program viruses and Trojan Horses.

Common sense must mix with technology to stop viruses. You shouldn't open file attachments from unfamiliar people. Even if a friend or co-worker sends you an attachment, you must find out what kind of an attachment it is *before* you open it. A list of jokes or a brief "I love you" note should be included in the body of the document, not as an attachment. If you aren't sure about the *provenance* (artspeak for "where did this come from?") of an email, contact the alleged sender to see whether their fingers wrote the message and added the attachment. Remember that "ILOVEYOU" and its imitators "borrowed" the IDs and address books of the senders to replicate themselves. You should scan new programs before you install them on your system, regardless of whether you downloaded them or broke the shrink-wrap on a retail package.

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Windows Me has an auto-update feature that can help you keep your browser and Outlook Express email client up to date to minimize the risk of getting clobbered by various types of attacks. Are you using this feature? If not, you should start.

Use the following procedure to check your settings for Windows Me's Auto-Update feature, which works whenever you connect to the Internet:

1. Click Start, Settings, Control Panel.

2. Open the Automatic Updates icon. The Automatic Updates screen appears as in Figure 17.17. You'll see the following options:

    - To automatically download and install updates, select Automatically Download Updates.

    - You can also select Notify Me, which displays available updates and gives you the option of when to download them and install them.

    - The third option, Turn Off, disables automatic updates.

    - Select Restore Hidden Items to see updates you have rejected (not installed yet).

Figure 17.17
Windows Me's
Automatic Updates
dialog box.
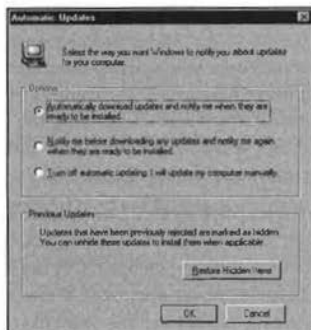
DETECTING AND STOPPING UNAUTHORIZED ACCESS

Even if you install the latest antivirus software and keep it up to date by downloading new virus information and replacing the program when improved detection features are developed, the leaky nature of your computer's connection to the Internet can still endanger your computer.

The only way to reliably stop port scanners and hack attacks via the Internet is to install a good personal firewall program. Personal firewalls provide security for your Internet-attached Windows Me computer by enabling you to stop unauthorized programs from entering your system or sending data out of your system without interfering with legitimate Internet activity, such as Web browsing, file transfers, and so forth.

A wide variety of personal firewalls is available, but two favorites in recent testing are the Norton Personal Firewall (available as a separate product or as part of the Norton Internet Security 2000 family) and Zone Labs' Zone Alarm and Zone Alarm Pro.

You can get more information about Norton Personal Firewall and Norton Internet Security 2000 from

http://www.symantec.com/sabu/nis/

You can get more information about Zone Alarm and Zone Alarm Pro from

http://www.zonelabs.com

Symantec, Gibson Research, and many other vendors offer free online testing of your system to check its vulnerabilities. If you're skeptical of the dangers of an unprotected system, try these testers first.

MANAGING A WINDOWS NETWORK

Whether your network is in your home or your office, network management can keep your network running quickly and reliably. Windows Me features several network management tools that are useful for networks of any size, including these:

- **Net Watcher**—Enables network administrators to manage remote resources
- **Remote Administration**—Enables network administrators to control Registry and desktop appearance, as well as shared resources
- **Home Networking Wizard**—Enables setup or modification of your network's basic settings on a machine-by-machine basis

→ To learn more about the Home Networking Wizard, **see** Chapter 18, "Setting Up a Home Network," **p. 447**

USING BUILT-IN NETWORK MANAGEMENT TOOLS

You will need to make one-time changes to each computer on your home network to use tools such as Net Watcher and Remote Administration, but after you enable them, you can control other computers from yours.

NET WATCHER

Net Watcher enables the administrator of a Windows Me network to perform the following services on remote computers without ever leaving her desk computer:

- View current network connections
- Disconnect users from the network or network resources
- Monitor which resources are being shared on the network and by whom
- Activate, deactivate, and modify resource shares

To connect to a remote computer from the Net Watcher application, the remote computer must have both file- and printer-sharing services and remote administration services enabled. Net Watcher can be used on both home and office networks. If your computer is running share-level security, as in a home network, you can connect only to other remote computers running share-level security. If your computer is running user-level security, as in an office network with a Windows NT, Windows 2000, or Novell NetWare server, you can connect to any other remote computers running file- and printer-sharing services.

Net Watcher is not installed by default. To install it, follow these steps:

1. Open the Control Panel.
2. Select Add/Remove Programs.
3. Select the Windows Setup tab.

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4. Scroll down to System Tools and select Details.

5. Click the box next to Net Watcher to place a checkmark next to the box.

6. Click OK to install Net Watcher.

7. Restart the computer if prompted.

Net Watcher has three views:

- **By Connections View**—Shows the currently connected users (see Figure 17.18).
- **By Shared Folders View**—Shows shared resources. This view also includes any printer shares on the remote computer.
- **By Open Files View**—Shows open files.

Figure 17.18
Net Watcher utility showing shared folders.
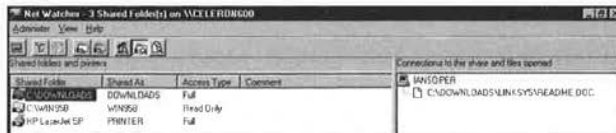
To connect to a remote computer from Net Watcher, follow these steps:

1. Go to Programs/Accessories/System Tools in the Start menu and choose Net Watcher.

2. From the Administer menu, click Select Server.

3. Enter the name of the Windows Me or 9x system that you want to monitor and click OK.

4. Enter the correct Remote Administration password for the remote computer.

Tip from

You can also run Net Watcher from My Network Places by right-clicking on a remote computer, selecting Properties, selecting the Tools tab, and clicking the Net Watcher button.

To share a resource on a remote computer while using Net Watcher, follow these steps:

1. Select By Shared Folders on the View menu.

2. Select Add Shared Folder from the Administer menu.

3. Type the resource path of the drive you want to share in the Enter Path box.

4. Click OK.

REMOTE ADMINISTRATION SERVICES

Remote Administration Services enable you, acting as the administrator of your small network, to manage remote resources, shares, and Registries and to modify the desktop environment and configuration on remote systems.

Remote Administration Services must be enabled on each computer managed by Remote Administration Services, and you must have at least one of the same network protocols running on each computer.

To enable Remote Administration Services on a Windows Me computer, follow these steps:

1. In the Control Panel, open the Passwords icon.

2. Click the Remote Administration tab.

3. Click the checkbox next to Enable Remote Administration of This Server.

4. On a home network using share-level security, enter and confirm the password that should control access to your system.

5. Click OK.

Tip from	When both file and printer sharing and user-level security are enabled on a Windows Me computer (as in a corporate network with a dedicated Windows 2000, Windows NT, or Novell NetWare server), remote administration is automatically enabled.

THIRD-PARTY NETWORKING SOLUTIONS

The broad range of networking features built into Windows Me has led most third-party network vendors to concentrate on areas where Windows Me offers no features or limited features. Such areas include

- Networking computers that use a mixture of operating systems
- Proxy servers for advanced Internet sharing plus enhanced security and performance

LANTASTIC

If you want to create a network that includes older computers using MS-DOS or Windows 3.1 as well as computers running Windows 9x, Windows NT, Windows 2000, and Windows Me, consider the LANtastic network operating system originally developed by ArtiSoft, but now sold by SpartaCom. LANtastic 8.0 provides security features far beyond those available with Windows Me's built-in networking, but is still far easier to configure and manage than a Novell-based or NT/2000-based client/server network.

To learn more about LANtastic 8.0, see

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http://www.spartacom.com/products/lantastic.htm
```

PROXY SERVERS AND GATEWAYS

As you've already seen, Windows Me contains a feature called Internet Connection Sharing (ICS) as part of its Home Networking Wizard. ICS is an example of a simple Internet gateway. A gateway enables other computers access to another network (the Internet, in this case).

Although ICS provides a workable solution for sharing an Internet connection (I use it myself in my small office), you might prefer more security and greater features in your solution. Many proxy-server and gateway products compatible with Windows Me are available on the market that are worth considering if you are not satisfied with the features of ICS. A proxy server performs the same job as a gateway, but can also provide extra tasks, such as antivirus for all connected computers, Web content filtering, and firewall services.

Tip from

Before you install a third-party proxy server or gateway program, make sure you remove Internet Connection Sharing from the Windows Me computer with the shared Internet connection.

Use the Add/Remove Programs icon in Control Panel and select the Windows Setup tab to remove ICS before you install proxy servers because proxy servers require settings different from ICS.

Some of the leading proxy servers for home and small-office use include the following:

- Ositis WinProxy (http://www.winproxy.com/)
- Sybergen SyGate for Home Office (http://www.sygate.com/products/gate_ov.htm)
- Deerfield.com WinGate (http://wingate.deerfield.com/)

You can find links to the trial versions of most of these programs and many others at the Proxy Servers section of WinFiles:

http://www.winfiles.com/apps/98/servers-proxy.html

You also can find third-party gateway or proxy-server programs included with a "boxed network" kit.

When you look at a proxy server for your home or small office, look at the following factors:

- **How many users will you connect to the Internet?**—Licensing varies by the number of users; the minimum is usually three computers, which is perfect for most home uses. If you plan to use the software in a small office, you might need to purchase a six-user, ten-user, or larger number of users.

- **How easy (or hard) is the configuration?**—As you saw earlier in this chapter, TCP/IP can be very difficult to set up if you must specify the settings yourself. One of the differences between home and small-business versions of proxy servers is the level of setup automation; if just thinking about IP addresses gives you an Excedrin headache, look for "no-brainer" installation features.

- **Do you need (or want) extra features such as content filtering, firewalls, or anti-virus?**—These add extra protection to your home network, but might require you to upgrade to a more advanced version. Compare the benefits of an "all-in-one" approach to what you can get by adding separate antivirus and firewall programs to your existing network.

RESTRICTING ACCESS TO SHARED FILES

When you create a shared resource on your network, you must restrict access to it. On a home network, this means that you must use at least one password for each shared resource.

You can actually set two passwords when you use share-level security on your home network: a full-access password and a read-only password.

→ To learn more about sharing resources and restricting access to them with Windows Me, **see** Chapter 19, "Sharing Files, Folders, and Printers," **p. 471**

SETTING UP USER PROFILES

User profiles are a good way to help keep a shared computer working the way each user wants it to work. By enabling user profiles, you enable each user to have customized wallpaper, Start menu, and other features.

→ To learn more about how to set up user profiles, **see** "Secrets of the Windows Masters: Establishing Custom Settings for Each User," **p. 205** in Chapter 8, "Changing the Look and Feel of Windows."

TROUBLESHOOTING

COMMON ETHERNET HARDWARE PROBLEMS

I installed a combo Ethernet card, but it can't detect the rest of the network. What's wrong?

A combo card is a card that has both an UTP port for 10BASE-T UTP Ethernet cable and another type of connector (either a 15-pin or BNC barrel-shaped connector) for older types of Ethernet cabling. If the card was previously used on an Ethernet network that didn't use 10BASE-T cable, you must reset the card for use with UTP cable. To reset the card, you will normally need to download and run a setup program made by the network card vendor.

The network occasionally goes offline, so I can't share my Internet connection or access other systems. What's wrong?

Occasional network outages such as this usually indicate problems with network cabling. Look carefully at the cabling; if the outer jacket is brittle or cracked, replace the cable. If your network cable has been in use for a long time, it might not meet the Category 5 specification required for Fast Ethernet; replace it. Bad cables make bad networks.

COMMON TCP/IP PROBLEMS

I can connect to another computer on my network, but not with the Internet.

CHAPTER **22**

CONNECTING TO THE INTERNET

In this chapter

DIAL-UP NETWORKING ESSENTIALS

Dial-Up Networking (DUN) in Windows Me controls both the physical connection process and the network protocols necessary to connect your computer to other computers via modem. Although you can use DUN to connect directly with mainframe computers to perform terminal emulation and with your home or office computer to perform remote access, most users of DUN will use it as part of the process of connecting with the Internet.

Through Dial-Up Networking, you specify the following:

- The modem you will be using for the connection
- The telephone number
- The location
- The network protocols you need
- The security settings you need
- Whether or not to use a login script
- Whether or not to link multiple modems together to make a single connection
- How to configure the Internet options

Although some of these issues have been covered in other chapters, this chapter will show you how to use DUN to connect to the Internet using a dial-up modem, as well as other, higher bandwidth, hardware options.

Before you can have an Internet connection, though, you must have the right kind of hardware installed.

SETTING UP HARDWARE

Traditionally, access to another computer from home meant that you needed just one kind of hardware: an analog (dial-up) modem. Although this is still true for the vast majority of computer users, more and more people are finding that newer technologies such as cable modems and DSL lines are better choices. Integrated Services Digital Network (ISDN) is also popular with users who must support a wide variety of telephony devices besides modems. This section deals with the installation and configuration of all these types of devices.

INSTALLING AND CONFIGURING A MODEM

High-speed Internet access is far faster, but dial-up connections that use a conventional modem are far more economical in terms of cash outlay: Your computer probably has a modem already installed, and an increasing number of companies such as AltaVista, NetZero, and many others offer free Internet access.

Tip from

EQ

Even if you already have a primary Internet service provider (either dial-up or high-speed), having a free Internet service option is useful if you travel or so you have a backup in case of problems with your primary ISP. For a list of free providers in the United States, see Free Pickins' summary available at

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http://www.freepickins.com/free_access2.htm
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To get online with any Internet service provider (ISP), you need a modem and a telephone line.

THREE WAYS TO CONFIGURE A MODEM

- If your computer had a modem installed when you installed Windows Me (or your computer with Windows Me already installed has a modem), it is probably already configured.

- If you haven't set up a modem previously, the section "Adding a New Analog Modem" later in this chapter includes a series of steps that automatically install the correct drivers and configure your modem.

- You also can use the Modems option in Control Panel to add a new modem or to configure an existing one.

Although most dial-up connections use only one modem at a time, you can install multiple communication devices. The system depicted in Figure 22.1, for example, includes an analog modem and an ISDN adapter. Note, however, that you can assign only one device to each Dial-Up Networking connection.

Figure 22.1
This system includes two communication devices: a 3COM ISDN adapter and a Microcom analog modem. Both are available for dial-up connections.

→ For instructions specific to installing a modem, **see** "Installing and Configuring a Modem," **p. 294**

→ Two or more modems can be used as a single logical unit for a connection if your ISP or other remote service supports Multilink. **See** "Changing Dial-Up Options," **p. 555**

ADDING A NEW ANALOG MODEM

Thanks to Plug and Play technology and an extensive database of modem configurations, Windows Me does an excellent job of identifying and configuring the correct modem type from a list of hundreds of choices. If your modem is Plug and Play–compatible, Windows should detect it automatically, install the correct drivers, and configure all relevant settings. For modems that don't take advantage of Plug and Play detection, you might have to perform the installation and configuration duties manually.

Note

PC Card modems for mobile computers require different installation procedures. Chapter 13, "Using Windows on a Notebook Computer," provides step-by-step instructions.

→ To learn more about installing and using PC Cards, **see** "Using PC Card Devices," p. 318

To add a new modem, follow these steps:

1. Open the Modems icon in Control Panel.

2. If you have not previously set up a modem on this system, the Install New Modem Wizard appears. If you are adding a new modem, click the Add button.

3. In the Install New Modem dialog box, click the Next button to enable Windows to detect your modem and proceed to step 4. If you've downloaded a driver or if the manufacturer supplied a driver on disk, and you're certain that this driver is more up to date than the built-in Windows drivers, select the option to skip detection, click Next, and skip to step 5.

4. If Windows detected your modem properly, click Finish to install the driver. Skip over all additional steps.

   If Windows did not correctly detect your modem, click the Change button and proceed to step 5.

5. If you bypassed the detection process or if Windows did not correctly detect your modem, Windows displays a list of available modem drivers. Choose the modem manufacturer from the list on the left and the model name from the list of modems on the right. If you have an updated Windows Me or Windows 9x driver, click the Have Disk button and specify the location of the driver.

6. Select the port to which the modem is attached. Most desktop PCs have two serial ports (COM1 and COM2), and a mouse might be attached to one; Windows does not list a serial port if the mouse is attached to it. If you have multiple free serial ports, Windows should detect the correct one. You might need to check the system documentation or the label on the physical port to verify which port the modem is using. For internal modems, the modem itself contains a serial port, configured either through Plug and Play or by means of jumper blocks or DIP switches.

7. Click Finish to install the driver and configure the modem.

Tip from

EQ

If you can't find a compatible Windows Me or Windows 9x driver for your modem, select (Standard Modem Types) from the top of the Manufacturers list and choose the generic model that most closely matches your modem's speed. Although you will lose any advanced features included with your modem, you should be able to send and receive data at the modem's rated speed.

CONFIGURING AN ANALOG MODEM

After you install drivers for an analog modem, it should be configured correctly. Still, it can't hurt to double-check settings to guarantee that the device is properly set up for maximum performance. Several nested dialog boxes include options for adjusting drivers, connection speeds, port assignments, and hardware-specific connection settings, including control over the volume of the modem's built-in speaker.

To set basic modem options, open the Modems icon in Control Panel, select the modem whose settings you want to adjust, and click Properties. A dialog box similar to the one shown in Figure 22.2 appears. Click the General tab.

Figure 22.2
Use the General tab to adjust the volume of the modem's internal speaker. (The Maximum Speed dialog box below the volume control has nothing to do with the modem's connection speed.)
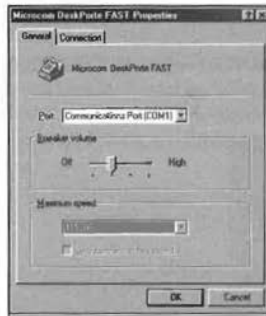
Three basic options are available here:

- **Port**—This dialog box displays the port the modem is configured to use. To switch the modem to another port, use the Port drop-down list.

Caution

If your external modem is connected to a serial port, you won't be able to use it unless you unplug it from the original port and reconnect it to the other serial port.

- **Speaker Volume**—This option enables you to adjust the modem's speaker. The slider control uses four positions: Off, Low, Medium, and High (from left to right). For most circumstances, the Low setting is the best because it enables you to hear the dial tone and handshaking sounds so that you know to retry a connection when your modem and

the one at the other end are not communicating without the sounds becoming over-powering. Use Medium or High if your internal modem isn't loud enough when you use the Low setting.

■ **Maximum Speed**—Don't be confused by the Maximum Speed control at the bottom of this dialog box. This setting controls the internal speed at which your computer communicates with the modem, and on virtually all Pentium-class or faster computers, that speed is invariably faster than the transmission speed of the modem itself. Previous versions of Windows typically set this value too low. On most Pentium PCs, you can safely set the port speed to 115,200bps. Reduce this setting only if you experience persistent data errors when sending and receiving. Avoid the checkbox labeled Only Connect at This Speed.

Tip from

EQ

If your external modem is connected to a high-speed serial port using a 16650 or faster universal asynchronous receive/transmit (UART) chip, or a USB port, you can increase the Maximum speed setting. 16650 and faster UARTs can handle internal speeds of 230,400bps, and most USB modems can support speeds up to 460,800bps. Check the documentation for your high-speed serial port or USB modem for the maximum recommended value, and adjust this value for better modem performance.

To set general connection options, click the Connection tab. You'll see a dialog box similar to the one shown in Figure 22.3.

Figure 22.3
Avoid the temptation to tinker with these connection settings. For most circumstances, the default settings work best.
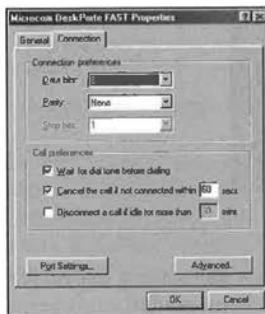
You can adjust the following settings here:

■ **Connection Preferences**—The Connection preferences section at the top of the dialog box specifies settings for data bits, parity, and stop bits. These settings are typically used for direct modem-to-modem communications rather than TCP/IP connections that use the Internet-standard Point-to-Point Protocol (PPP) or Serial Line Interface Protocol (SLIP). You should not have to adjust these settings for Internet access.

If you are connecting to a mainframe computer, though, changes in these settings may be necessary. Check the requirements for a remote computer before you make any changes.

If you need to connect with computers that use different preferences, you should change these settings in the Dial-Up Networking connection you create for each computer, rather than here.

- **Call Preferences**—Note the checkmark in front of the box labeled Wait for Dial Tone Before Dialing. If your phone system uses a dial tone that differs from the standard U.S. dial tone, Windows mistakenly believes the line is dead and refuses to dial until you clear this box. Likewise, voice-mail systems that alter the normal dial tone to a "stutter" signal can confuse Windows unless you clear this box.

  If you choose the option Cancel the Call If Not Connected Within XX Secs, you must enter a value for a number of seconds in the box. The 60-second timeout is sufficient for most domestic calls. If some of your dial-up connections routinely require lengthy connect times, you should increase this value to avoid timeout errors.

  The Disconnect a Call If Idle for More Than XX Mins option lets you specify the amount of time the connection can be idle before Windows disconnects automatically. This setting is appropriate only for modem-to-modem connections; for Internet connections, use the timeout settings defined by the Internet Explorer Connection Manager, found in IE 5.5's Tools, Internet Options, Connections menu. Select a dial-up connection and click Settings, Properties to adjust these values.

Finally, you can set hardware-specific options that control the basic functioning of your modem. Click the Advanced button to see the dialog box shown in Figure 22.4.

Figure 22.4
Adjust these advanced connection settings only if you understand the consequences of your actions. Unnecessary tinkering here can actually reduce data transmission speeds.
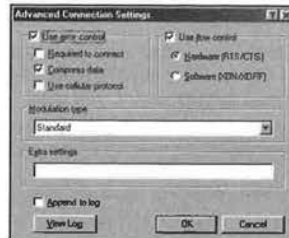
Four advanced options are available in this dialog box:

- **Use Error Control**—Error control options reduce the likelihood of noisy phone lines causing data corruption. Most modern modems support both data compression and error control. The modem information file should set these options for your specific modem. The Use Cellular Protocol box enables the MNP10 error control protocol,

which can be used with some (but not all) cellular modems (and also is supported by many recent internal and external modems).

- **Use Flow Control**—Flow control governs the integrity of the connection. By default, Windows Me enables hardware flow control, and most modern modems support this mode for best performance. Software flow control should never be used for an Internet connection.

- **Modulation Type**—Modulation changes how the modem converts data to and from digital format. The nonstandard modulations (Bell and HST) available here are designed for 300bps and 1200bps connections only, and will rarely (if ever) be used on today's high-speed modems. Do not change modulation types unless the manufacturer of your modem specifically recommends that you do so.

- **Extra Settings**—If necessary, click in the Extra Settings box and add AT commands that enable or disable a particular feature of your modem or adapter. For example, S0=5 tells your modem to answer automatically after five rings. Check your modem documentation for AT commands applicable to your hardware.

> **Note**
>
> Zoom Telephonics offers a comprehensive source of information about modem technology and the AT command set. You can browse its infobase at
> http://www.modems.com

DIFFERENCES IN CONFIGURATION BETWEEN EXTERNAL AND INTERNAL MODEMS

Most modems supplied with PCs are internal, connecting to a PCI or sometimes an ISA slot on the motherboard. In addition, most low-cost modems sold as upgrades are also internal. External modems can be either RS-232 serial-port–based, plugging into a 9-pin serial port, or USB-based, connecting to a USB port or hub.

For Windows Me users, configuration of these modems is virtually the same regardless of type, except for COM port usage.

External RS-232 serial modems connect to a COM port already in the computer; if a conflict occurs between an external modem and another device, you must adjust the COM port setting. If you set an external modem to use another COM port, you must unplug the modem and plug it into the other COM port.

Internal modems have a COM port onboard. When an internal modem's General properties are displayed, the COM port is generally not adjustable. To adjust an internal modem's COM port, you must use the Windows Me Device Manager (if the modem supports Plug and Play and changes to its PnP configuration) or set the modem's COM port manually.

External USB modems have their COM ports assigned during installation; check the Windows Me Device Manager to see whether you can adjust the value if necessary.

CONFIGURING A CABLE MODEM

Cable modems are becoming the preferred high-speed Internet access method for PC users who live in locations with modern cable TV because the same fiber-optic line that brings you everything from *A&E Mysteries* to HBO's *Boxing After Dark* can also connect to your favorite Internet sites—fast. Speeds range from 400Kbps for the older, one-way cable modem to as high as 1.5Mbps with a two-way cable modem. Thus, cable modems are 7–25 times faster than 56Kbps modems running at their maximum speeds.

The term *cable modem* is a misnomer because *modem* actually refers to the conversion of digital computer signals to analog tones for telephone-line transmission and the reverse. Cable modems come in two forms:

- **Two-way cable modems**—These are actually network devices that attach to your PC via a standard 10BASE-T Ethernet network card (NIC).

- **One-way cable modems**—These are used for downloading only and fit into an expansion slot (usually ISA) on your computer. Your analog modem is used for page requests and uploads. One-way cable modems are found primarily on older cable systems that have not been upgraded to fiber-optic standards.

Although details vary according to the cable modem ISP, you will typically need to open the Networks icon in the Windows Me Control Panel to install and configure your 10BASE-T Ethernet NIC with the TCP/IP protocol. Most cable modems use a dynamic IP address, which is the default configuration for Windows' TCP/IP protocol. However, if your cable modem ISP assigns you a static IP address, you must also edit the properties of the TCP/IP network protocol running on the Ethernet NIC. Typically, in addition to setting the IP address, you also might need to set values for a DNS server, WINS or DHCP, and gateways.

→ To learn more about TCP/IP configuration with Windows Me, **see** Chapter 17, "Windows Networking 101," **p. 413**

After making changes in your computer's Network properties, you must restart the computer before the changes take effect.

Tip from

EQ

If you make the changes in the Windows Me Networks icon for your new cable modem connection, but can't get on the Web with your browser, check the Internet Options' Connection dialog box. If you previously had a dial-up Internet connection, your browser is still set to use your old dial-up modem. Because cable modems are "always on," set your browser option to Never dial a connection and adjust the LAN (network) settings if necessary. Contact your cable modem ISP for any special settings you might need for your browser.

Caution

Two-way cable modems and DSL connection are "always on," making it easier for hack attacks to be attempted against your computer. See Chapter 17, "Windows Networking 101," and Chapter 23,"Keeping Your Internet Connection Secure," for suggested countermeasures.

SETTING UP A DSL LINE

Similar to cable modems, digital subscriber line (DSL) high-speed Internet access is a network-based technology that involves installing and configuring a10BaseT Ethernet NIC and the Network properties sheet.

If your DSL connection uses the typical dynamic IP address option, you will not need to adjust the default configuration of Windows Me's TCP/IP protocol. However, if you have a static IP address, you will need to configure several elements of the TCP/IP configuration for your network card.

With either DSL or cable modem configuration, especially if you use a static IP address, recording the TCP/IP protocol settings you must make for the Ethernet NIC that connects you to the Internet should be high on your must-do list. It's all too easy with Windows Me to change the Network settings.

→ For more information about configuring network cards with TCP/IP, **see** "Configuring TCP/IP," **p. 455**

Before you can connect either a cable modem or a DSL line to your computer, the 10BASE-T Ethernet card must be installed. Because network drivers for both Windows Me and the network card will be installed during the installation of the cable modem or DSL line, have your network driver disk and Windows Me CD-ROM handy. If Windows Me's compressed CAB files are installed on the hard disk (normally in the C:\Windows\Options\Install folder), you might not need your Windows Me CD-ROM.

CONFIGURING AN ISDN ADAPTER

Most home and small-office dial-up connections use conventional analog lines. In some areas, you can use the ISDN to establish high-speed digital connections.

Although ISDN lines are faster and more reliable than analog modems, their cost is much higher than DSL or cable modem Internet access and their performance is much slower (ISDN dual-channel Basic Rate runs at 128Kbps versus 512Kbps or more for cable modem or DSL, depending on the service). Similar to a cable modem or DSL connection, ISDN enables you to use your telephone for voice or fax transmissions while you access the Internet.

Compared to DSL lines or cable modems, an ISDN connection can be a nightmare, and the technology is difficult and filled with jargon.

The ISDN device that connects your computer to an ISDN line is referred to as a *terminal adapter*. Unlike Ethernet network cards, terminal adapters come in all shapes and sizes, and every piece of hardware uses a different setup routine. Some devices install as network

adapters, others as modems, and still others as routers on a network. When you choose an ISDN device from the Add Hardware option in Control Panel, Windows installs the ISDN Wizard. This tool enables you to configure the technical details of your ISDN line, as shown in Figure 22.5.

Tip from

EQ

You can connect up to eight devices to a single ISDN line. These devices can be a mix of all types. For example, network routers and bridges, ISDN fax machines, ISDN telephones, and standard analog telephone devices can be connected to a single ISDN line, although many ISDN terminal adapters for residential use support fewer devices.

Figure 22.5
Although some ISDN adapters emulate modems, this device from Eicon Systems looks like a network card to Windows.

Although the ISDN Configuration Wizard makes setup somewhat easier than it used to be, the process is still complex. When connecting an ISDN line, you must get detailed instructions from the manufacturer of the adapter and from the phone company—and then follow those instructions to the letter. At a minimum, you need to know the service provider IDs (SPIDs), the telephone numbers for each channel, and the switch type used in the telephone company office. Some ISDN hardware includes a utility that enables you to upload this information directly to the adapter.

Tip from

EQ

After you successfully install your ISDN adapter, it appears as a choice in the Internet Connection Wizard and the Dial-Up Networking Wizard.

CONFIGURING A BASIC DIAL-UP CONNECTION

Windows Me makes getting on the Internet with your modem easier than it was several years ago, thanks to features such as the Internet Connection Wizard and enhanced Dial-Up Networking wizard. In this section, you'll learn how to create and configure a basic dial-up connection.

USING THE INTERNET CONNECTION WIZARD

Whether you pay $15 a month, $20 a month, or $0 a month, there's no shortage of ISPs and online services across the country and around the world who can provide you with dial-up Internet access. Windows Me supplies all the software you need to make a fast, reliable Internet connection. All you need to add is a modem or other connecting device. Although many ISPs provide a setup program that will configure your connection, you should still understand the process so that you can manually create or modify a connection if it is altered or if the dial-up number or other settings change.

The first time you open the Internet icon on the desktop, you launch the Internet Connection Wizard (see Figure 22.6). After you run through this initial setup routine, when you click the Internet icon, the Internet Explorer program starts.

The Internet Connection Wizard can be run whenever you need to correct or verify Internet settings. It can also be run from Start, Programs, Accessories, Communications.

Figure 22.6
These three options are just a small sampling of what you can do with the Internet Connection Wizard.

The Internet Connection Wizard is a remarkably versatile piece of software. After you get past the initial explanatory screen, you have three choices:

- You can sign up for a new Internet account. The Internet Connection Wizard offers a referral list of ISPs in your area.

Note

Windows Me also comes with client software and the setup program for four major national ISPs: AOL (America Online), AT&T World Net, EarthLink, and Prodigy Internet. To install any of these clients, select Start, Programs, Online Services.

- You can set up an existing Internet account for access through Windows Me, either over the phone or through a network.
- You can tell the Internet Connection Wizard to use your existing Internet connection. If you're comfortable with TCP/IP and networking, this is a reasonable choice.

Don't underestimate the Internet Connection Wizard. Although it's easy to stereotype it as a tool for beginners, this wizard is useful for experts as well, and it handles nearly every imaginable task when it comes to setting up and managing Internet connections. Because of the sheer number of choices available when you run the Internet Connection Wizard, trying to explain or illustrate every step would be pointless (and probably impossible). But here is a partial list of what you can use it for:

- Install and configure a modem (or set up a LAN connection for Internet access instead).
- Adjust the dialing settings you use, including the local area code and the prefixes you use to access outside lines.
- Create and edit Dial-Up Networking connection icons for one-button access to the Internet.
- Adjust advanced Internet settings.
- Enter and edit account information you use to connect with an ISP.

Note

If you have not yet installed Dial-Up Networking, the Internet Connection Wizard installs these system services automatically. You might need your original Windows CD-ROM if the program cannot locate your Windows installation (CAB) files, and you must restart the computer to complete the installation.

The top option on the Internet Connection Wizard lets you choose an ISP and set up a new Internet account. Although the Wizard provides you with a fast and easy way to select a new ISP and start your service, the Wizard supports only a few national ISPs, and will not provide you with the opportunity to sign up with a local or regional ISP. For these reasons, I recommend that you contact the ISP you prefer directly and receive either a sign-up kit or instructions you can use to configure your account manually, as discussed in the following section.

USING THE INTERNET CONNECTION WIZARD TO CONNECT WITH AN EXISTING ISP ACCOUNT

If you already have an account with an ISP, the wizard's step-by-step procedures can help you create a Dial-Up Networking connection with a minimum of clicking and typing. The default settings assume you're making a standard PPP connection, with IP address and Domain Name Server (DNS) settings assigned dynamically. Follow these steps:

1. Start the Internet Connection Wizard and choose the option to set up a connection manually, or I Want to Connect Through a LAN. Click Next to continue. Steps 2 and 3 apply only for configuring a dial-up connection.

Caution

Use the special setup software provided by your ISP instead of this wizard if you are configuring an Internet connection that uses both an analog modem (for uploads) and a broadband connection for downloads, such as DirecPC and one-way cable modems.

2. Choose the option to connect using your phone line and click Next.

3. Enter the dial-in phone number of your Internet service provider. You can adjust advanced settings for the connection by clicking the Advanced button. For standard PPP connections for which you don't need to specify an IP address or DNS servers, select No and click Next. (See the next section, "Adjusting Advanced Settings," for more information on when and how to adjust the advanced settings.) Click Next when you are ready to move on.

4. Enter your username and password and click Next.

5. Give the connection a descriptive name, as in Figure 22.7, and click Next.

6. If you need to set up mail and news accounts or a directory server, the wizard provides separate steps to help with each of these tasks. (See Chapter 26, "Using Outlook Express for Email," and Chapter 27, "Using Outlook Express to Read Newsgroups," for instructions on setting up these accounts.) When you reach the end of the wizard, click Finish to create the Dial-Up Networking connection icon.

ADJUSTING ADVANCED SETTINGS

As you saw in step 3 of the previous procedure, the Internet Connection Wizard includes an option for adjusting advanced connection settings. If your Internet service provider uses a SLIP connection or requires scripting, or if you need to enter a fixed IP address and specify addresses for DNS servers, select the Advanced button and fill in the entries on the Connection and Addresses tabs of the Advanced Connection Properties sheet (see Figure 22.7).

Figure 22.7
When you select the Advanced button, the Internet Connection Wizard enables you to configure the connection type, logon procedure, and IP addresses required to make your connection.
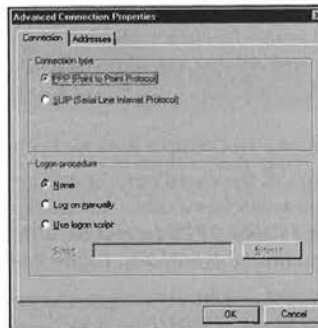
Advanced settings include the following:

On the Connection tab:

- **Connection Type**—Choose PPP or SLIP connection.
- **Logon Procedure**—Either select the manual option to bring up a Terminal window when connecting or specify a logon script.

On the Addresses tab:

- **IP Address**—If your ISP provides a fixed IP address, enter it here.
- **DNS Server Address**—If your ISP requires you to specify primary and backup name servers, enter their IP addresses here.

Tip from

EQ

These Advanced settings are useful if you have multiple dial-up accounts (a corporate dial-up server and a personal account with an ISP, for example). Create a separate Dial-Up Networking icon for each account, and then individually adjust the IP address and other settings for each connection icon.

CREATING AND EDITING LOGON SCRIPTS

Today, most commercial ISPs use logon servers that communicate easily with Windows Dial-Up Networking connections. Some older providers or noncommercial dial-up sites, however, might require additional keyboard input that the Windows connection can't provide. In such cases, you must create a logon script for use with the Dial-Up Networking connection. When you open a connection icon whose configuration details include a script, Windows opens a Terminal window and sends the additional commands. The script might operate unattended in the background, or it might stop and require that you make an entry in the Terminal window.

Script files are simple text files that end in the extension SCP. You'll find these four general-purpose scripts in the Program Files\Accessories folder:

- **CIS.SCP**—Establishes a PPP connection with CompuServe
- **PPPMENU.SCP**— Logs on to a server that uses text menus
- **SLIP.SCP**—Establishes a SLIP connection with a remote host machine
- **SLIPMENU.SCP**—Establishes a SLIP connection on a menu-based host

Tip from

EQ

Some scripts require editing before use. If so, the prudent approach is to back up the script file you plan to modify before you make any changes.

To assign a script to a connection icon, follow these steps:

1. Open the Dial-Up Networking folder, right-click the icon, and choose Properties from the shortcut menu.
2. Click the Scripting tab. The dialog box shown in Figure 22.8 appears.
3. Click the Browse button and navigate to the Accessories folder. Select a script from the list and click Open.

Figure 22.8
Choose a logon script from this dialog box. Then, click the Edit button to open Notepad and edit the script.

4. If you need to modify the script, click the Edit button. The script opens in Notepad. Make any necessary changes and save your changes before closing the Editing window.

5. To avoid being distracted by the script as it runs, check the Start Terminal Screen Minimized box.

6. To tell Windows that you want the script to pause after each step so you can see where modifications are needed, check the Step Through Script box.

7. Click OK to save your changes.

When you open a Dial-Up Networking connection with a script attached, the Terminal window appears. If you selected the Step Through Script option, Windows also displays the Automated Script Test window (see Figure 22.9). Use the step option to walk through a logon script one step at a time for debugging purposes.

Figure 22.9

Normally, the terminal window doesn't accept keyboard input. If you need to respond to a prompt, check the Allow Keyboard Input box in the terminal window. When the script has finished processing, you might need to click Continue to complete the connection.
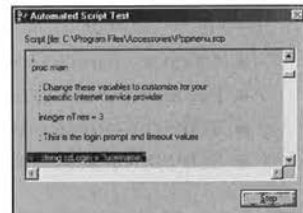
Note

For detailed documentation of the dial-up scripting language, look in the Windows folder for a file named SCRIPT.DOC.

MANAGING MULTIPLE DIAL-UP NETWORKING CONNECTIONS

Windows stores every connection icon you create in the Dial-Up Networking folder. Although you can make copies and shortcuts for use elsewhere, the only way to create or manage these icons is to open the Dial-Up Networking folder (see Figure 22.10). You'll find it inside the Communications folder on the Start menu or in the Control Panel.

Note

Believe it or not, some Microsoft documentation calls these icons *connectoids*.

Figure 22.10
Open the Dial-Up Networking folder to create or manage your connection icons. Note the additional Create and Dial icons in the toolbar just above and slightly to the left of the phone number.
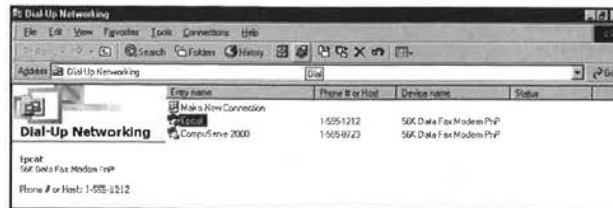
Like the Desktop, Control Panel, and Printers folders, the Dial-Up Networking folder is a special system folder and doesn't have a corresponding MS-DOS–style directory. To make this folder more accessible, either open the My Computer window and drag the Dial-Up Networking icon onto the Quick Launch bar or drag the icon onto the Start button to create a shortcut at the top of the Start menu.

ADDING A NEW DIAL-UP NETWORKING CONNECTION

As you've seen, the Internet Connection Wizard creates connection icons as part of the process of configuring your Internet connection. If you're comfortable working directly with connection icons, you can create them from scratch by using a two-step wizard accessible from the Dial-Up Networking folder. Follow these steps:

1. Open the Dial-Up Networking folder and open the Make New Connection icon.

2. In the Make New Connection Wizard, give the connection a name and select a modem or other communication device. Then, click Next.

3. Enter the area (or city) code, country code, and phone number of the server you want to dial. Click Next.

4. Click Finish to save the connection in the Dial-Up Networking folder, where you can edit it later.

> **Caution**
>
> Although this wizard provides a quick way to create a Dial-Up Networking icon, the default settings almost always require editing.

ADJUSTING THE PROPERTIES OF AN EXISTING CONNECTION ICON

Regardless of how you create a Dial-Up Networking connection icon, you can change its properties at any time. Open the Dial-Up Networking folder, select an icon, right-click the icon, and choose Properties. You'll see a multiple-tab dialog box similar to the one in Figure 22.11.

Figure 22.11
Use this dialog box to change the phone number or modem associated with a connection.

On the General tab, you can adjust the area code, country code, and phone number for any connection. You also can change the modem or other connecting device you use for the connection.

Click the Networking tab to adjust properties specific to the server with which you plan to connect. Figure 22.12 shows the choices available.

⚠ *If you're having trouble connecting to a Remote Access Server (RAS), see "Problems Connecting to the Remote Server" in the "Troubleshooting" section at the end of this chapter.*

The Type of Dial-Up Server drop-down list contains five choices. You'll select PPP in most cases. If you're dialing into a UNIX server with a shell account, however, you might need to choose SLIP or CSLIP.

> **Note**
>
> *PPP* stands for Point-to-Point Protocol. *SLIP* is short for Serial Line Interface Protocol. PPP has largely replaced SLIP as the standard method of remotely accessing Internet service providers, thanks to its better error-checking features and its capability to handle automatic logons.

Figure 22.12
If your ISP uses any nonstandard settings, you need to adjust them here.
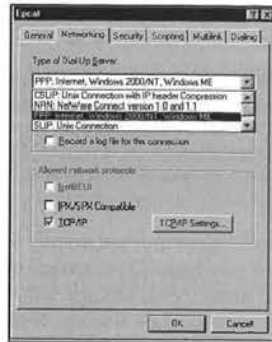
Advanced options you can enable include the following:

- **Enable software compression**—Normally, a modem's hardware compression features are used instead. Do not enable this setting unless the ISP recommends it.

- **Record a log file for this connection**—You can enable this feature to help troubleshoot a connection. The file is saved to a LOG (plain-text) file in the Windows folder.

→

Click the TCP/IP Settings button to check the configuration details of your connection. You'll see a dialog box similar to the one in Figure 22.13.

Figure 22.13
If your ISP has assigned you a static IP address, enter it here, along with the addresses of DNS servers.
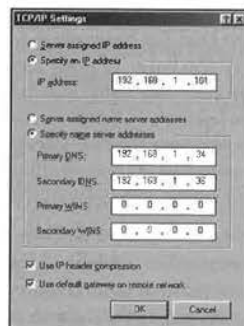
The default settings for a Dial-Up Networking connection assume you're dialing into a network that assigns you an IP address automatically each time you connect, without requiring you to specify DNS servers. On networks that use static IP addresses, you manually fill in your IP address and the addresses of DNS servers. For access to an ISP, leave the

WINS server entries blank and don't change the default gateway or IP header compression unless your ISP specifically recommends it.

Note

Windows Me, unlike earlier versions of Windows, sets the default protocol for all Dial-Up Networking connections to TCP/IP, which makes setting up Internet connections very simple. If you use Dial-Up Networking to connect to other types of networks, you might need to select NetBEUI or IPX/SPX-compatible protocols to make your connection.

Select the Security tab to store your username, password, and domain for this connection, and to adjust Advanced Security options for your login. Don't change the defaults for Advanced Security options unless your ISP needs special settings. For example, most ISPs support Password Authentication Protocol (PAP) or the Challenge Handshake Authentication Protocol (CHAP). If you check the Require Encrypted Password box, you won't be able to log on.

Caution

Storing your username, password, and domain saves you time when connecting, but it also exposes you to the risk of unauthorized personnel using your Internet account and being able to read, send, and abuse your email accounts.

If you decide to store this information, you can also select Connect Automatically. When this option is selected, your connection is dialed as soon as you open the icon for your connection.

In most cases, these are the only changes you need to make to your connection. Select OK to record the changes.

CREATING A SHORTCUT TO A DIAL-UP CONNECTION ICON

Although connection icons can exist only in the Dial-Up Networking folder, you can create shortcuts to those icons and use them anywhere you want. To place a shortcut on the desktop, open the Dial-Up Networking folder, select an icon, right-click it, and choose Create Shortcut. You also can right-drag a connection icon to any folder or onto the Start menu and choose Create Shortcut(s) Here from the menu that appears when you release the icon.

MOVING OR COPYING CONNECTION ICONS

Right-clicking a connection icon does not produce Cut, Copy, or Paste menus. But you can share these icons with other users or copy them to other machines if you know the undocumented technique. When you drag a connection icon out of the Dial-Up Networking folder and drop it in any legal location, including the desktop Quick Launch bar or mail message, Windows creates a special Dial-Up Networking Exported File, which has the DUN extension.

These exported files resemble shortcuts but behave differently. There's no shortcut arrow, for example. In addition, when you right-click a Dial-Up Networking Exported File icon and choose Properties, you see an abbreviated properties sheet in place of the normal shortcut information. But if you drop one of these files in the Dial-Up Networking folder of another machine running Windows 95 (with Dial-Up Networking version 1.1 or later), Windows 98, or Windows Me, the file works just as though you'd created the connection from scratch. This technique is excellent for quickly giving other users access to Dial-Up Networking without forcing them to go through the process of creating a connection icon from scratch.

RENAMING AND DELETING CONNECTION ICONS

To rename a connection icon, open the Dial-Up Networking folder, select the icon, right-click, and choose Rename. To delete a connection icon, select the icon, right-click, and choose Delete.

CHANGING DIAL-UP OPTIONS

Under normal conditions, you will not need to make frequent configuration changes in a dial-up networking connection after you establish it. However, if you change locations, need to switch ISPs because of connection problems, or want to use multiple modems with a single connection, you might need to make the changes discussed in this section.

CHANGING DIALING LOCATIONS

Each time youuse a Dial-Up Networking connection icon, you have the option of specifying from which *location* you want to dial. Settings for each location include the area (or city) code for that location, calling card information, prefixes required to reach an outside line or to dial long distance, and much more. Locations are especially useful for owners of portable PCs: By simply selecting a location entry from a list, you can tell Windows to dial the access number for your ISP's server when you're at home but to use a dialing prefix, area code, and calling card number when you're on a business trip in another city.

Even if you always dial in from your home or office, you can still take advantage of multiple locations—especially if your Dial-Up Networking calls sometimes incur long-distance or toll charges or if your telephone company requires special dialing procedures for nearby area codes.

To set up dialing locations for the first time, use the Telephony option in Control Panel. To adjust dialing options on-the-fly when you're making a dial-up connection, click the Dial Properties button to the right of the phone number in the Connect To dialog box. And if you've opened the Modems option in Control Panel, you can click the Dialing Properties button on the bottom of the General tab. Regardless of which technique you use, you'll see a dialog box similar to the one in Figure 22.14.

Figure 22.14
You can use dialing locations to define dialing prefixes and area code preferences or to bill your calls to a telephone credit card.
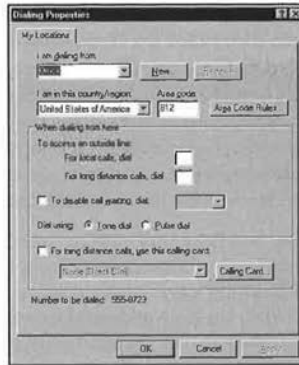
Another good use of dialing options, at least for residents of the United States, is to help cope with the explosion of new area codes over the past few years. At one time, people dialed all local calls direct and dialed 1 plus the area code and number for long distance. No more. Today, most large metropolitan areas have been partitioned into smaller zones, each with its own area code. As a result, some local calls demand an area code, but others don't. No firm set of rules dictates when you dial 1.

Compared to Windows 95, Windows Me vastly improves your ability to deal with nonstandard area codes and dialing configurations. To adjust these options, open the Dialing Properties dialog box and click the Area Code Rules button. Windows displays the Area Code Rules dialog box shown in Figure 22.15.

Figure 22.15
Have local dialing rules changed for you? Use these advanced area code options to tell Windows exactly how to dial.
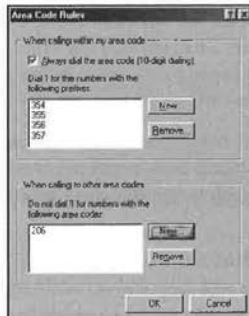
Use the options at the top of the dialog box to specify dialing rules for prefixes within your own area code. The bottom options specify how to handle nearby area codes.

Tip from

EQ

Would you prefer to not use dialing properties at all? When you create a Dial-Up Networking connection icon, clear the check mark from the box labeled Use Area Code and Dialing Properties. Then, enter the phone number exactly as you want Windows to dial it, complete with any prefixes, area codes, city or country codes, and calling card numbers.

To learn how to use dialing properties along with a telephone credit card, see "Secrets of the Windows Masters: Charging Your Internet Connection to a Telephone Calling Card" at the end of this chapter.

USING MULTILINK OPTIONS FOR FASTER CONNECTIONS

Most dial-up Internet connections are simple one-modem, one-line propositions, and transmission speed is limited by the slower of the two modems at the ends of the connection. Under specialized circumstances, though, you can use two or more connecting devices to increase the speed of a dial-up connection. These so-called *multilink connections* require the following conditions:

- You must have multiple devices to bind together into a single virtual connection.
- Each device requires its own driver software.
- Each device needs access to a separate analog phone line or a channel on an ISDN line.
- The dial-up server at the other end of the connection must support multilink PPP connections.

The most common use of multilink connections is to join two 56Kbps or 64Kbps channels on an ISDN line to create a 112Kbps or 128Kbps connection. However, you can also bond an analog modem to an ISDN modem, or two analog modems together.

After you have verified that your ISP supports multilink connections, and you've made arrangements to make the connection, you can enable multilink options on an existing connection by following these steps:

1. Open the Dial-Up Networking folder, right-click the connection icon you want to modify, and choose Properties from the shortcut menu.
2. Click the Multilink tab. The dialog box shown in Figure 22.16 appears.
3. Select the Use Additional Devices option, and the grayed-out buttons at the bottom of the dialog box become available.
4. Click the Add button and choose a modem or ISDN adapter from the drop-down list. If no choices are available, your second modem has not been set up properly; click Cancel and set up your additional hardware.
5. Enter a separate phone number for the additional device if required. The hardware documentation and service provider can supply more details about your specific configuration.
6. Select any entry in the list and use the Remove or Edit button to modify the entry.
7. Click OK to save your changes.

Figure 22.16
If your ISP supports multilink PPP, use these settings to combine two modems to create a faster virtual connection.

Tip from

If you are using ISDN, make sure that the ISDN card is dual channel. If it is not, you cannot use multilink.

CHANGING DIALING OPTIONS

If you normally use one ISP (either dial-up or "always on" DSL or cable modem), but have set up a connection for another ISP to use in emergencies, or you have problems dialing in or keeping your connection going, use the Dialing tab of the properties sheet for your Internet connections in Dial-Up Networking (see Figure 22.18).

To view the properties seen in Figure 22.17, right-click the icon for your connection and select the Dialing tab.

Figure 22.17
Use the Dialing dialog box to change your default Internet connection and adjust other options for a more reliable connection.
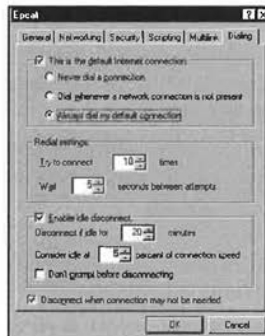
Use the Dialing dialog box to do the following:

- **Select your default Internet connection**—If you change your primary ISP, change this option accordingly in both your former and current primary ISP's connection properties sheets.

- **Adjust redial settings**—If you have problems getting connected to this ISP, adjust the values for redialing and delays between redials.

- **Adjust the settings for disconnecting when idle**—Adjust the values and settings here if your system disconnects when you need the connection to stay active for a longer period of time. These settings take effect only if you are not surfing or downloading.

Click OK to accept the changes you make.

Note

Especially in busy urban areas, it's good computer etiquette to allow your computer to drop an idle Internet connection; this enables other users of the same service to access the Internet. Regardless of your settings here, some ISPs will use their own standards to determine an idle connection and disconnect you to free up a line for another user. If you want "always on" service plus faster speeds than what your analog connection can provide, get a cable modem or DSL line.

CONNECTING TO THE INTERNET

After you've created a Dial-Up Networking icon that contains your connection settings, you can establish a connection by using any of these three methods:

- Open the Dial-Up Networking folder and use that icon to manually connect to the Internet. This option gives you maximum control over when and how you connect to the Internet.

- Set up Internet Explorer to automatically open a Dial-Up Networking connection whenever you attempt to access a Web page. By default, this option requires you to respond to a confirmation dialog box before actually dialing. This option is appropriate if you use a single line for voice and data calls.

- Use advanced settings in the Dial-Up Networking folder to make a hands-free connection that doesn't require confirmation from you whenever you attempt to access any Internet resource. This option is best if you have a dedicated data line and don't want any interruptions from Windows.

⚠ *If you can't get your modem to dial using Internet Explorer, see "Problems with Dial-Up Networking" in the "Troubleshooting" section at the end of this chapter.*

MAKING A MANUAL CONNECTION

To connect to the Internet manually, follow these steps:

1. Select the connection icon and open it. A dialog box similar to the one shown in Figure 22.18 appears.

2. Check your username and enter a password if necessary. To store the password for reuse, check the Save Password box.

3. Check the entry in the Phone Number box. If the format is incorrect, choose a new location or edit the number to include the required prefixes.

Figure 22.18

4. Click the Connect button. Windows opens a modem connection and attempts to dial the number. You'll see a series of status messages as the connection proceeds.

> **Note**
>
> Regardless of the settings you defined for the connection icon, the Connect To dialog box lets you temporarily change the phone number, username, location, and other settings—even the service to which you want to connect. You can also enable the Connect Automatically option if you specify both your username and password.

After you successfully complete the connection, you will see an informational dialog box similar to the one in Figure 22.21. At the same time, a Dial-Up Networking icon appears in the notification area to the right of the taskbar. Some online services, such as the one in Figure 22.19, give you the option of closing the box automatically when the connection is made.

Figure 22.19
Some online services display a box like this one briefly after your connection has been made.

MONITORING CONNECTION STATUS

Whenever you have an open connection to the Internet, you can check its status in a variety of ways. For example, you can double-click the icon in the system tray, or you can right-click that icon and choose Status. Both methods enable you to see the total time this connection has been open and the total number of bytes you've received and sent (see Figure 22.20).

Figure 22.20
To eliminate the display of connection information in the bottom of this status dialog box, click the No Details button.

Tip from

EQ

To see status information at a glance without opening a dialog box, simply point to the icon in the notification area. After a few seconds, a ScreenTip will appear with this information.

CLOSING YOUR INTERNET CONNECTION

When you've finished working with your Internet connection, you have three options for closing it:

- Right-click the icon in the notification area and choose Disconnect.
- Right-click the connection icon in the Dial-Up Networking folder and choose Disconnect. (Note that the same menu is available if you right-click a shortcut to a connection icon.) This technique is useful if the taskbar icon is not available for some reason.
- If the connection status dialog box is open, click the Disconnect button (you can open this box by double-clicking the connection icon in the system tray).

CONNECTING (AND DISCONNECTING) AUTOMATICALLY

Internet Explorer includes a component called Connection Manager, which can automatically establish an Internet connection whenever you attempt to access a Web page. You can configure Connection Manager to pause for confirmation or to dial automatically.

Note

Connection Manager does not work with other Internet programs. If you want Outlook Express to dial automatically each time you check your mail, you'll have to set up separate dialing options from that program.

To set up Connection Manager, open the Internet Options dialog box (right-click your IE icon and choose Properties) and click the Connection tab. Select the Dial-Up Networking Connection you want to use as a default from the Dial-Up Settings list and select Always Dial My Default Connection. If this is not the default setting, use the Set Default button to change the default.

Use the Settings button to go to the dialog box for this connection, shown in Figure 22.21.

Figure 22.21
Provide the missing information (username, password, and so forth) and Internet Explorer will make the connection for you whenever you open it.
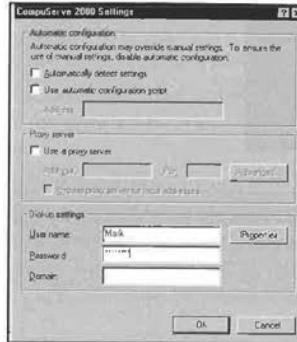
After you configure all Connection Manager options, click OK to close the Settings dialog box and then click OK again to close the Internet Options dialog box. Next, open Internet Explorer and try to access a Web page. If you don't have an open Internet connection, you'll see a Connect To dialog box similar to the one in Figure 22.22.

Figure 22.22
By default, Connection Manager prompts you before trying to make a dial-up connection.

Here are some tips for getting maximum benefit out of Connection Manager:

- Check the Save Password box to store your password in the Windows cache. Remove the check from this box if you don't want other users to be able to access your Internet account.

- If you see the Connection Manager dialog box but you're not ready to connect, click the Work Offline button. This stops Internet Explorer from dialing the modem. Use this option if you are using Internet Explorer to view offline pages, such as those used for software or hardware help files on CD-ROM or disk or pages you saved to disk previously.

- Check the box labeled Connect Automatically if you have a dedicated modem/data line and you won't need to confirm your action each time you dial.

If you're working with a Web page when the idle timer expires, Internet Explorer won't suddenly close the connection. Instead, you'll see an Auto Disconnect warning dialog box similar to the one shown in Figure 22.23. You have 30 seconds to respond before Connection Manager shuts down access to the Internet.

The Auto Disconnect dialog box gives you these options:

■ Click the Disconnect Now button to close the connection immediately.

■ Click the Stay Connected button to reset the timer and continue working with Internet Explorer.

■ Check the Don't Use Auto Disconnect box to disable this feature until you reset it. (This step has the same effect as clearing the checkbox in the Dial-Up Settings dialog box.)
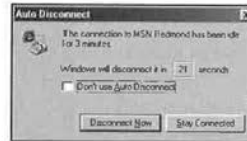
Figure 22.23

Caution

Some sites can keep an Internet connection open indefinitely. For example, stock tickers that automatically refresh every few minutes keep your connection from hanging up, as do sites that deliver streaming data, such as RealAudio. Don't expect Internet Explorer to disconnect automatically if you leave one of these pages open and then walk away from your computer.

MAKING A HANDS-FREE MANUAL CONNECTION

If you prefer not to use the Connection Manager, open the Internet Options dialog box and configure Internet Explorer to connect via a local area network. With this setting, you must connect manually by using a Dial-Up Networking connection icon before attempting to access a Web page. To turn this procedure into a single-click process, follow these steps:

1. Open the Dial-Up Networking folder.

2. Open the connection icon you want to automate, and then enter your username and password. Check the Save Password box.

3. Click Connect. When the status dialog box appears, click Cancel to abort the connection and return to the Dial-Up Networking folder.

4. Choose Connections, Settings.

5. Clear the checkmark in front of the box labeled Show a Confirmation Dialog After Connected (see Figure 22.24).

6. Click OK to save your changes.

Figure 22.24
Use these settings to bypass all dialog boxes when you click a connection icon.
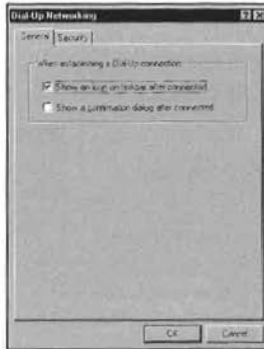
TROUBLESHOOTING

PROBLEMS WITH DIAL-UP NETWORKING

I can't get Internet Explorer to dial my modem!

If you have configured Internet Explorer to dial your modem, but your modem isn't dialing when you open your browser, make sure your modem is working correctly. To check modem operation, follow this procedure:

1. Open the Control Panel.
2. Select the Modems icon.
3. Select the Diagnostics tab.
4. Select the COM port to which your modem is connected.
5. Select More Information to query your modem.

A properly working modem displays information in the status window. If you get a Can't Open Port error instead, you might have the modem connected to the wrong COM port, it might be turned off (if external), or it might need to be reset (internal or external).

If you get a correct status report, but you still can't dial with Internet Explorer, make sure that IE is in fact set to dial the correct modem. If you change modems, be sure you set Internet Explorer to dial the correct online service, and ensure that service is using the correct modem.

PROBLEMS CONNECTING TO THE REMOTE SERVER

I am unable to establish a connection to the RAS.

If you are having problems connecting to a remote server, ensure that your system and the remote system are using the same protocol, such as TCP/IP. If both systems are using TCP/IP, make sure the TCP/IP configuration on both systems is configured properly. That

means the IP address, subnet mask, and default gateway on both the client and the server are correct. On the client side, you might also have to edit the routing table to indicate a specific network or host to receive packets.

To make the changes necessary to your TCP/IP configuration, it helps to understand DNS (the Domain Name Server).

The Internet uses DNS to resolve (or translate) computer and fully qualified domain names (FQDNs), such as www.mcp.com, into IP addresses. A DNS server maintains a database, which is really a flat-text file maintained by a DNS administrator, that maps domain names to IP addresses. As with most types of file systems, DNS organizes the FQDNs in a hierarchical fashion with a corresponding IP address mapping.

Most ISPs dynamically assign IP addresses for DNS servers to their clients on demand. If yours does not or if you have a direct connection to the Internet, you must configure your system to point to a DNS server. In this case, and assuming you have Microsoft TCP/IP installed on your system, these settings are configured in the TCP/IP Settings dialog box in Dial-Up Networking. You need to know the IP address of your local DNS server for this method to work.

Follow these steps to configure your system to point to a DNS server:

1. In Dial-Up Networking, right-click the connection you have defined for the Internet, and then click Properties.

2. In the connection's properties sheet, click Server Types, and then click TCP/IP Settings.

3. In the TCP/IP Settings dialog box, select the Specify an IP Address option and type your IP address.

4. Select the Specify Name Server Addresses option, and then type the IP address of the DNS server in the Primary DNS dialog box.

Your ISP will inform you if you need to use DNS or other means of making your connection. You should record the proper TCP/IP configuration in case it is altered.

SECRETS OF THE WINDOWS MASTERS: CHARGING YOUR INTERNET CONNECTION TO A TELEPHONE CALLING CARD

If your ISP has multiple access numbers and you sometimes get a busy signal on your local number, you might want to call a number outside your area code. To that end, you can set up a location that lets you charge the daytime calls to a less expensive long-distance provider with a telephone credit card.

Follow these steps to set up a new location called Credit Card Call from Home:

1. Use the Telephony option in Control Panel to open the Dialing Properties dialog box.

2. Click the New button, and then click OK in the message box that confirms you've created a new location.

3. Note that the text in the box labeled I Am Dialing From is selected. Start typing to replace the default location name with a descriptive entry, such as Credit Card from Home.

4. Check the box labeled For Long Distance Calls, Use This Calling Card.

5. Select your calling card number from the drop-down list. If you're using a prepaid card or if your telephone card isn't in the list, select None (Direct Dial).

6. Click the Calling Card button, and the dialog box shown in Figure 22.25 appears.

Figure 22.25
Use the Calling Card dialog box to set up access options for a telephone calling card.
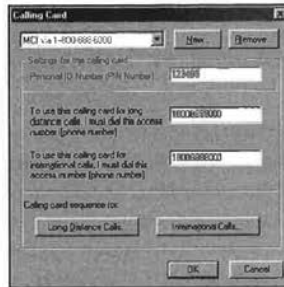
7. If you're creating a new card type, click the New button and give the entry a name. Enter your PIN (if required) and enter or verify access numbers for long-distance and international calls.

8. Click the Long Distance Calls button. The dialog box shown in Figure 22.26 appears, with suggested default settings for your call. Make a note of the sequence of steps your long-distance company requires for you to make a call with your calling card and then use the drop-down lists to add or edit those steps here.

9. Click OK to save this sequence and repeat the process for international calls if necessary.

10. Click OK to save your dialing settings.

Now, whenever you want to use a telephone calling card to call a Dial-Up Networking connection, just select the appropriate location in the Connect To box. Windows automatically punches in the correct sequence of tones.

Figure 22.26
Although this dialog box looks daunting, it's remarkably effective for scripting calls you make with a calling card.
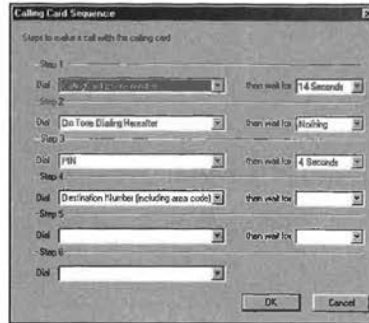
Tip from

Because Telephony locations work with all TAPI applications, you can use these same calling card settings with the Windows Me Phone Dialer (found in the Accessories group) and other communication programs as well.

CHAPTER **26**

USING OUTLOOK EXPRESS FOR EMAIL

In this chapter

IS OUTLOOK EXPRESS THE RIGHT MAIL PROGRAM FOR YOU?

Outlook Express, the default email client software in Windows Me, includes the basic tools you need to compose, send, and receive mail over the Internet. It uses this basic email interface for a second purpose as well: to let you read and participate in threaded discussions on Internet newsgroups. See Chapter 27, "Using Outlook Express to Read Newsgroups," for details.

If you originally set up an email account using other email clients, such as the email software included with Windows 95, you have an important decision to make when you upgrade: Should you stick with your old mail software, or should you switch to Outlook Express?

Starting with the first release of Windows 95, every version of Windows has included a desktop icon labeled Inbox. In the original version of Windows 95, this icon launched a program called the Exchange Inbox. Microsoft promised that this "universal inbox" would be capable of storing email from just about anywhere, as well as faxes, voice mail, and other types of data. If you've used Exchange Inbox, though, you know it's hard to configure, slow, and notoriously buggy; the fax components in particular are a usability nightmare.

In the years since the original release of Windows 95, Microsoft has updated the Exchange Inbox program slightly. The new version was renamed Windows Messaging. The update fixed several bugs (and added a few new glitches), and the new name was supposed to help dispel confusion with Microsoft Exchange Server, Microsoft's mail server package for businesses.

In Windows Me, Windows Messaging is no longer present; it has been completely replaced by Outlook Express. Microsoft also sells a full-featured mail package called Outlook 2000 (usually purchased with the Office 2000 suite).

If you currently use Exchange Inbox or Windows Messaging, should you switch to Outlook Express? The answer depends on how the rest of your mail system works:

- If you have been using Exchange Inbox or Windows Messaging to gather email exclusively through industry-standard Internet mail servers, you should switch to Outlook Express. It's simple to set up, much easier to use, and does a superb job of handling Internet mail.

- If you send and receive email using a Microsoft Exchange server on a corporate network, you must use an Exchange-compatible client program. Acceptable options include the Exchange Inbox, Windows Messaging, or Outlook 2000 (included with Microsoft Office 2000), Outlook Express 5 is an option if your Exchange Server uses the *Internet Message Access Protocol (IMAP)* format or *Post Office Protocol (POP3)*.

- Microsoft Fax and other MAPI-compatible applications do not work with Outlook Express. (*MAPI* stands for *Messaging Application Program Interface*, a Microsoft standard for communication between email applications. Outlook Express supports only Simple

MAPI, which enables programs such as Word and Excel to use Outlook Express for sending messages.) For full MAPI compatibility, you must use an Exchange-compatible mail client.

STARTING OUTLOOK EXPRESS

When you install Windows Me, you also install Outlook Express; you cannot avoid adding Outlook Express on initial setup. You can, however, uninstall the program if you decide you prefer other mail and news clients. (To uninstall Outlook Express, open the Add/Remove Programs option in the Control Panel, click the Install/Uninstall tab, choose Outlook Express, and click the Add/Remove button.)

A shortcut to Outlook Express 5 resides on the Quick Launch portion of the taskbar. Also, you can find Outlook Express 5 by clicking the Start button and choosing Programs. It is in the main list of folders and programs.

Outlook Express 5 imports preferences already configured by past Microsoft Mail clients and has eliminated the need to prompt you to select a location for storing data files.

If you have an existing Outlook Express 4.x account, Outlook Express 5 automatically stores your files under the Program Files\Outlook Express directory. Outlook Express 5 also creates a folder in the root directory (that is, Windows) under Application Data\Identities\<*a custom unique identifier is the label of your folder*>. This folder stores your mail and news data and manages multiple mail account files if you choose to create multiple Identities in Outlook Express (so that multiple users can access their mail through the same application without having to shut down the computer or lose an Internet connection).

If you want to move these data files after setting up Outlook Express for the first time, follow these steps:

1. Use Windows Explorer to move all data folders to their new locations.
2. Open the Registry Editor and find HKEY_CURRENT_USER\Software\Microsoft\Outlook Express.
3. Double-click the Store Root value, and change that value to reflect the new location.

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Caution

Think twice before using the Registry Editor and always make a backup. Incorrectly editing the Windows Registry can result in data loss and can cause programs not to start or not to run properly.

However, storing your Outlook Express data files on a drive devoted to data (such as D: or E:) makes a great deal of sense. Backups are easier, and if a virus or other problem forces you to reformat C: drive and reinstall everything, you will still have your messages.

→ To learn about backing up and recovering the Registry, **see** "Backing Up and Restoring the Windows Registry," **p. 136**

After you configure Outlook Express, running the program takes you to the start page, which lets you move quickly between your email, newsgroups, and contacts (see Figure 26.1).

Figure 26.1
From this start page, you can jump to your email inbox, follow threaded discussions on an Internet news-group, or search for address information in your list of con-tacts.
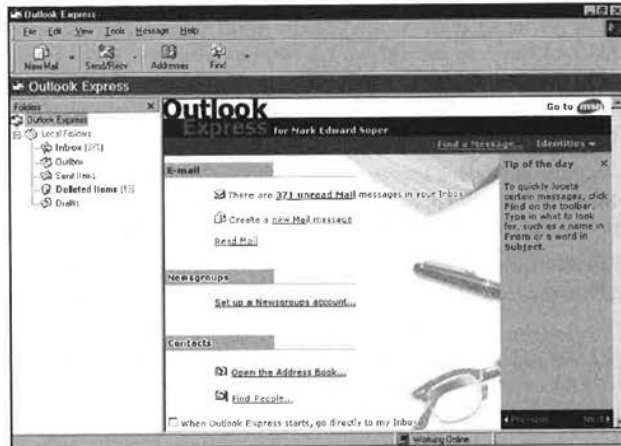
Tip from

EQ

If you are comfortable with the choices available in Outlook Express, you can bypass the start page and enter directly into your inbox. This option is listed at the bottom of the Outlook Express 5 start page. Or, you can choose Tools, Options; click the General tab; and check the box labeled When Starting, Go Directly to My Inbox Folder. Regardless of the method you choose, when Outlook Express opens, it automatically opens into your inbox.

CONFIGURING INTERNET EMAIL ACCOUNTS

Before you can use Outlook Express to send and receive email, you must supply some basic configuration information. At a minimum, you have to enter the name and type of the mail server that stores and forwards your messages, along with the username and email address associated with your mail account. The Internet Connection Wizard handles all Outlook Express setup details, although you can also configure accounts manually. If you did not use the wizard when you first set up Internet Explorer 5.5 (IE5.5) or if you skipped the mail and news steps, Outlook Express 5 enables you to add new accounts by choosing Tools, Accounts and then selecting the Add button. The Add button gives you a choice between adding a new Mail, News, or Directory Services Account through an Internet Connection Wizard specific to each function.

⚠ *If you are having problems receiving or sending email with Outlook Express, see the "Troubleshooting" section at the end of this chapter.*

If you receive Internet mail from multiple sources—from a corporate server and a personal account with an Internet service provider (ISP), for example—you must establish separate Outlook Express mail accounts for each one. No limit exists to the number of mail accounts you can set up in Outlook Express.

SETTING UP A DEFAULT EMAIL ACCOUNT

When you start Outlook Express for the first time, the program prompts you to set up a default mail account. (If you need to add an account at a later time, use Tools, Accounts and select the Add button.)

Follow the wizard's prompts to enter the following information:

- **Your name**—This entry is the display name that appears in the From field when you send a message. Most people enter their real name; you might want to add a company affiliation or other information to help mail recipients identify you more readily.

- **Your email address**—This is the address that will be used for all email you send and receive unless you specify a separate Reply address.

- **Your reply address**—This address is used whenever a reply to: address is needed, as with outgoing mail. If it is left blank, your normal email address is used for both sent and received email.

- **Mail server information**—As Figure 26.2 shows, you must fill in addresses for incoming and outgoing mail servers even if a single server performs both jobs. Be sure to specify the mail protocol your incoming server uses: POP3 (the default setting), IMAP, or Hypertext Transfer Protocol (HTTP).

Figure 26.2
You must enter names for the servers that handle incoming and outgoing mail. In most cases, the same server handles both chores.
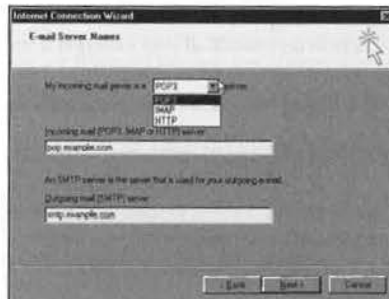
Note

Although Outlook Express supports three widely used mail standards, most Internet service providers transfer email using servers that run *Simple Mail Transfer Protocol (SMTP)*. To download messages from an SMTP server, most mailclients use version 3 of POP3. A newer standard, IMAP, isn't as widely used. Hotmail uses the HTTP standard.

■ **Logon information**—Enter the account name you use to log on to the mail server. If you enter a password in this dialog box, Outlook Express stores the password and uses it each time you check mail. For extra security, leave the Password box (shown in Figure 26.3) blank, and you are asked to enter it each time you check for mail. The Secure Password Authentication (SPA) option is rarely used by Internet service providers; if you receive mail over the Microsoft Network, however, you should check this box.

Note

Secure Password Authentication protects your password against interception, but many email services don't support it. *Don't* select SPA unless your email server requires it. If you use SPA on a service that doesn't support SPA, you'll get an error message indicating that you could not log in. Most email services inform you at setup or with online help whether or not you need to enable this option.

Figure 26.3
Leave this Password box blank if you want to keep other users from accessing your mail. Outlook Express asks for your password each time you connect to the server.
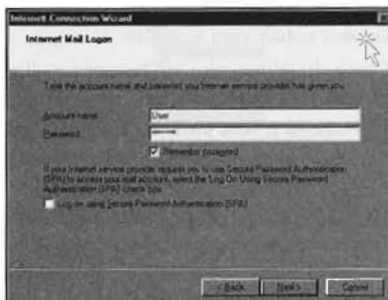
Note that as soon as you complete configuration of an email account and connect to the Internet, Outlook Express by default downloads all your messages from your email server and deletes them from the server.

→ To learn how to keep your messages on your email server, **see** "Checking the Mail from Another Computer," **p. 679**

Tip from

If you prefer to keep your email on your server, disconnect your computer from the network (or don't dial up the Internet) while you configure your email account. Follow the procedure listed in the section "Checking the Mail from Another Computer" to set your email defaults; then, you can connect to your email server with Outlook Express.

MANAGING MULTIPLE EMAIL ACCOUNTS

To configure additional mail accounts, choose Tools, Accounts. Click the Add button, choose Mail, and the relevant portions of the Internet Connection Wizard run again.

SETTING UP A HOTMAIL ACCOUNT

Although Web-based email lacks many of the powerful sorting and configuration options available with an email client such as Outlook Express, the fact that you can retrieve it from anywhere with just a Web browser has made this form of email incredibly popular.

Free email services such as Microsoft's own Hotmail are providing people who don't even have a computer the opportunity to send and receive messages online from libraries and offices.

Outlook Express features built-in configuration for Hotmail accounts, making it easy to manage your Hotmail email with this powerful client.

To add a Hotmail address to Outlook Express, follow these steps:

1. Start the process of adding an email account as outlined earlier.

2. When prompted for an Internet email address, enter your existing Hotmail address if you have one; skip to step 4.

3. If you don't have a Hotmail address, select I'd Like to Sign Up for a New Account from Hotmail and follow the prompts.

4. On the E-Mail Server Names screen, the proper Hotmail configuration (HTTP mail server, service provider, and incoming server) have already been supplied by Outlook Express.

5. Verify your account name and enter your password; click Finish on the final screen to set up Hotmail support.

MANAGING MAIL FOR MORE THAN ONE USER

On many Windows Me computers, one user gathers mail from one or two Internet mail accounts. But Outlook Express lets you manage mail in more complex environments, with multiple users of the same computer accessing separate mail accounts through the Identity feature. Identities are managed through the Manage Identities dialog box (see Figure 26.4).

To add a new identity to your installation of Outlook Express, do the following:

1. Select Identities from the File menu. Choose Manage Identities.

2. Click the New button to add a new identity.

3. When Outlook Express prompts you to add the new account name, enter your new account name and then click the OK button.

4. You are asked whether you want to switch to the new identity. Choose Yes to immediately set up the new account connection information. If you choose No, you can choose File, Switch Identities when you are ready to set up the new account.

5. When you select the new identity for the first time, the Internet Connection Wizard sets up your new account information to get connected to your new mail and news accounts.

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Figure 26.4
The Manage Identities dialog box enables you to add or change user information for multiple users to access the same Outlook Express 5 application without having to disconnect from the Internet. You can also choose File, Switch Identities to change accounts.

You also can choose File, Identities, Add New Identity and then follow the preceding steps to add the new name and set up the new connection.

To remove an identity, select the identity in the Manage Identities dialog box list and click Remove. You must have at least one identity.

You can also change the identity that is default at startup, or let Outlook Express 5 prompt you for the user identity at each startup.

To have Outlook Express prompt you at the application's start, in the Manage Identities dialog box, clear the checkbox next to Use This Identity When Starting a Program. And, when you exit Outlook Express, make sure you choose Exit and Log Off Identity. If you choose Exit, the current identity will continue to be used.

When you restart Outlook Express, it asks you to choose an identity (see Figure 26.5).

Figure 26.5
When you establish multiple identities and don't have a default identity selected, Outlook Express prompts you to choose the identity to use when you start the program.

If you choose to switch identities and to log off of your current identity, Outlook Express exits and remains closed. If you choose to switch identities and choose the new identity, without logging off of your current identity, Outlook Express automatically closes the current identity and then opens the new one.

You can add a password to an identity to provide a minimal level of security, but each identity's message folder stored locally will still be visible from Windows Explorer. Use User

Profiles at Windows Me startup to provide a greater level of security. If you enable User Profiles, each user's email is stored in a separate folder that is not visible to other users during normal operation.

ADJUSTING PROPERTIES FOR AN EXISTING MAIL ACCOUNT

To change the settings for a mail or news account after you set up Outlook Express, click Tools, Accounts; select the entry you want to change; and click the Properties button. The first account you create in the mail and newsgroup becomes the default account for that category. That's an important distinction because it determines which information appears onscreen when you click the Read Mail or Read News icon on the start page, and it defines which SMTP server Outlook Express uses when sending messages. To change default mail or news accounts, select the account and click the Set as Default button.

For both types of accounts, use the General tab to change the friendly name for the account or to edit personal information (see Figure 26.6). This dialog box lets you add the name of your organization and specify a different reply-to address. For example, if you send a message using your corporate mail account but prefer to receive replies via your personal Internet mail account, enter the personal address in the Reply Address box. When recipients reply to your message, their mail software should automatically insert the preferred reply-to address.

Figure 26.6
Edit the Reply Address for a mail or news account if you want to receive replies at an address other than the one from which you send messages.

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The Servers tab enables you to change the name or logon settings for mail and news servers. The Advanced tab, on the other hand, enables you to adjust timeout settings (sometimes necessary over very slow connections) and break apart lengthy messages (required by some mail servers running older software). Do not adjust these settings unless specifically instructed to do so by the server's administrator.

SELECTING CONNECTION OPTIONS

For each Outlook Express mail and news account, you can specify how you prefer to connect to the Internet: over a LAN or by using a modem. If your computer is permanently

connected to a network with Internet access, you can set all your accounts for LAN access and be done with it. But on machines with dial-up Internet access, particularly Notebook computers, you should pay close attention to these settings.

Each time you create a new account, you have a chance to specify Connection properties. To adjust these settings after you create an account, choose Tools, Accounts; select the account name; click Properties; and click the Connection tab. You see a dialog box similar to the one in Figure 26.7.

Figure 26.7
This dialog box enables Outlook Express to override the default connection settings in IE5.5. You can choose to add a different dial-up connection to access this particular mail server.
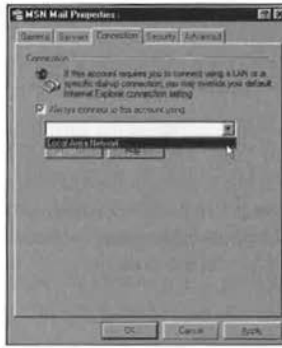
What's the difference between the two connection options?

■ **Connect using a local area network (LAN)**—The LAN option assumes you have a full-time connection to the Internet through a local area network. Unless you choose to work offline, Outlook Express checks for mail every 30 minutes. To change the interval for checking mail, choose Tools, Options; click the General tab; and change the value in the Check for New Messages Every *x* Minutes setting located in the Send/Receive Messages section.

Tip from

EQ

If 30 minutes is way too long to wait for incoming messages from your Hotmail mailbox, enable MSN Instant Messenger, included with Windows Me, to receive immediate notification of Hotmail messages. See Chapter 29, "Using MSN Messenger and NetMeeting," for details.

Note

The LAN connection is also the correct setting for "always on" connections, such as DSL line or cable modem connections to the Internet.

■ **Connect using a specific dial-up connection**—Choose a Dial-Up Networking connection from the list in the Connections dialog box or click the Add button to create a new connection. Outlook Express dials this connection whenever you attempt to access this particular mail or news server. Use this option if you do not use the IE5.5 dialer (for example, if you access the Web through a proxy server) but must use a dial-up connection for email.

Notebook users might want to create multiple copies of mail and news accounts, each with a different connection type, to handle various working environments. For example, you can specify a LAN connection when you're connected to the office network but use a dial-up connection to make a manual connection when you're working in a hotel room.

SETTING UP A DIRECTORY SERVICES ACCOUNT

You can also use Outlook Express 5 as a client for the Lightweight Directory Access Protocol (LDAP). Several major directory service accounts (Bigfoot, InfoSpace, VeriSign, and WhoWhere) are preconfigured in Outlook Express 5, and you can add more accounts.

To configure a directory services account, follow this procedure:

1. Open the Tools menu.

2. Select Accounts.

3. Select the Directory Services tab.

4. Select the Directory Service you want to configure.

5. Select Properties (see Figure 26.8).

Figure 26.8
The properties sheet for a directory services account in Outlook Express 5.

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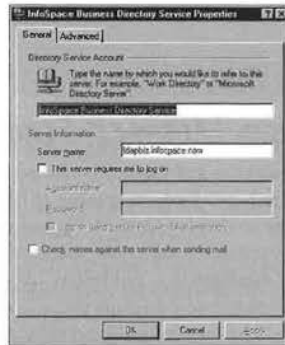
6. On the properties sheet, verify or change the account name and server name, and then add logon information as needed.

7. If you need to adjust settings such as the port number or adjust the use of Secure Socket Layers (SSL) or search options, click Advanced to make your changes (see Figure 26.9).

Figure 26.9
The Advanced tab of
the Properties sheet
for a directory services
account in Outlook
Express 5.

8. Click OK when done.

To create a new directory services account, follow these steps:

1. Open the Tools menu.

2. Select Accounts.

3. Select the Directory Services tab.

4. Click Add and select Directory Services.

5. Enter the LDAP server name and specify whether you need to log on.

6. Provide your username and password if required; specify SPA if necessary.

7. Specify whether to check email addresses with this directory service.

8. Click Finish.

CHOOSING YOUR PREFERRED MESSAGE FORMAT

Each time you use Outlook Express to compose a message, you choose whether to use plain text only or to add graphics, colors, and rich-text formatting using HTML (also referred to as Rich Text). If most of your messages go to users of Outlook Express or other HTML-compatible mail programs, rich-text formatting can make your messages livelier and more readable. With HTML formatting, your messages look and behave like Web pages; you can specify fonts and their sizes, change text colors, use paragraph styles, and control text alignment. You can add background colors and graphics, bulleted and numbered lists, and hypertext links to other Web pages.

All that fancy formatting is lost, though, if your correspondents use email software that can't interpret HTML. They'll see a plain-text version of your message along with a file attachment that they can open in a Web browser. In fact, there's a good chance they'll be annoyed when they receive your HTML messages because even a simple one-sentence message typically occupies 1K or more of disk space when translated into HTML.

Note

Users of Netscape mail products can send and receive HTML-formatted mail as well, although you might notice minor differences in the look of messages sent between Netscape and Microsoft clients.

Outlook Express lets you set separate default formats for mail and news messages, and it enables you to override those settings on individual messages. Unless you're certain that nearly all your email recipients can handle HTML attachments, your best bet is to choose plain text for mail messages. Likewise, on newsgroups where people use a variety of news reader clients, it's good manners to specify plain text as your default format.

To adjust the default settings, follow this procedure:

1. Choose Tools, Options and click the Send tab. You see the dialog box shown in Figure 26.10.

Figure 26.10
These default settings send all your mail messages in HTML format, with plain text the preferred format for news messages.

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2. In the Mail Sending Format box, select HTML or Plain Text as the default format for mail messages.

3. In the News Sending Format box, select HTML or Plain Text as the default format for messages you post to newsgroups.

4. After you specify a format, the Settings button lets you specify additional formatting options. These choices are shown in Figure 26.11.

Figure 26.11
If recipients complain about stray characters (especially equal signs) in text messages, try changing HTML text encoding from Quoted Printable to None.
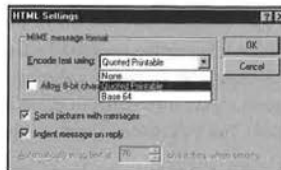
⚠ *For more details about the problem mentioned in Figure 26.9, see "Text Encoding" in the "Troubleshooting" section at the end of this chapter.*

EXCHANGING DATA WITH OTHER MAIL PROGRAMS

If you currently use another email package and plan to switch to Outlook Express, the process is simple and straightforward. Outlook Express can import address books and archived messages from the following popular mail clients:

- Eudora Pro or Eudora Light (version 3.0 or earlier)
- Netscape Mail (versions 2 or 3)
- Netscape Communicator
- Microsoft Internet Mail
- Microsoft Exchange Inbox
- Windows Messaging

In addition, you can import messages from Microsoft Outlook 2000 and also Outlook Express 4 or 5. (See the following section for detailed instructions on how to transfer address information from Outlook 2000 to Outlook Express.)

IMPORTING DATA INTO OUTLOOK EXPRESS

You can import the following types of data into Outlook Express:

- Address Book (WAB) from another copy of Outlook Express or other programs using WAB files
- Another Address Book (files from the email programs listed earlier, plus Comma Selected Values data files)
- Messages
- Mail account settings
- News account settings

When importing messages or addresses, Outlook Express first asks you to specify the mail program and then checks data file locations specified for that program in the Registry. If Outlook Express can't find the program on your system, a dialog box lets you specify the location.

Each import option goes through a series of dialog boxes, with slightly different choices that depend on the mail program or data type you start with.

If you choose to import data from a text file with comma-separated values, for example, you must specify which Outlook Express fields should receive each column of data in your text file. As Figure 26.12 shows, Outlook Express makes a reasonable guess at mapping fields in your text file to those in your Address Book. You can manually adjust the relationship

between fields; check the box to the left of each field to include or remove it from the import operation. Click the Change Mapping button, and you see a drop-down list of available Outlook Express fields.

Figure 26.12
Outlook Express won't recognize the Organization label in this text file; click the Change Mapping button to tell Outlook Express that the data belongs in the Company field.

You can use the import choices to bring in messages or addresses even if your Address Book or message store already contains data. When the program detects that a record you're trying to import already exists in your Address Book, you see a dialog box similar to the one in Figure 26.13, at which point you can choose whether to keep the existing entry or replace it with the new data.

Figure 26.13
Click Yes to All to completely replace matching records in your Address Book with new data from an import file.
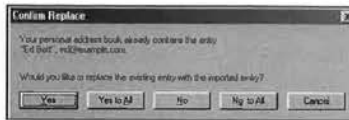
EXPORTING DATA TO ANOTHER PROGRAM

Unfortunately, Outlook Express isn't nearly as cooperative when it comes to moving messages and address information back to competing mail programs. When you choose File, Export from the Outlook Express menu, you can easily move information into Outlook 2000 or Microsoft Exchange.

To transfer addresses into other programs, follow this procedure:

1. Open the File menu and click Export.
2. Select Address Book.
3. Select either of the following:
   - Microsoft Exchange Personal Address Book
   - Text File (Comma Separated Values)

4. Click Export.
5. Enter a name for the exported file. Click Browse to choose a location for the file. If you select Text File as the export type, the file is stored as a CSV file.

6. If you select text file, however, the following dialog box appears. Choose the fields you want to export (see Figure 26.14). Some fields are selected by default; change the defaults as necessary. If you don't use some fields, deselect them.

Figure 26.14
Selecting fields to export with the Address Book Export feature.
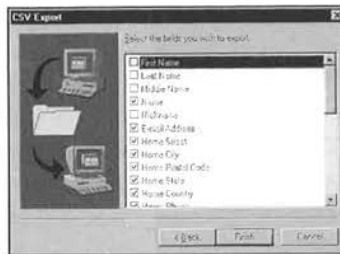
7. After you select the fields to export, click Finish to complete the process. Click OK when prompted. Then, click Close to return to Outlook Express.

8. The resulting file is a text file whose first line contains the fields you selected, separated by commas. Each record in your address book is a separate line, with the contents of each field separated by commas. The file can be opened by Microsoft Excel and most other spreadsheet and database programs.

9. To use the file in your destination program, follow its instructions for importing a CSV (Comma-Selected Values) file.

USING OUTLOOK AND OUTLOOK EXPRESS TOGETHER

While Outlook Express can export data directly to the Microsoft Exchange or Outlook 2000, getting data to flow from Outlook 2000 to Outlook Express is difficult.

Why? Despite the similarity in names, which might lead you to believe that Outlook Express is a simplified version of Outlook, the products really have very little in common other than being Microsoft products that can handle email. Outlook 2000, similar to earlier versions, handles email plus contacts and calendars. Ironically, although Outlook 2000 requires Outlook Express to be present, the two products do *not* use common file formats.

If you use the Exchange Inbox from early versions of Windows 95, Windows Messaging (Windows 95 OSR 2.x), or Outlook 2000, Outlook Express offers to convert your messages and addresses from their common message and Personal Address Books format the first time you run the program, as shown in Figure 26.15. If you upgraded to Windows Me from Windows 98, you have no import/export worries because Outlook Express 5 was also used in Windows 98.

Figure 26.15
Switching from the older Exchange Inbox to Outlook Express can be as easy as clicking Next in this dialog box.
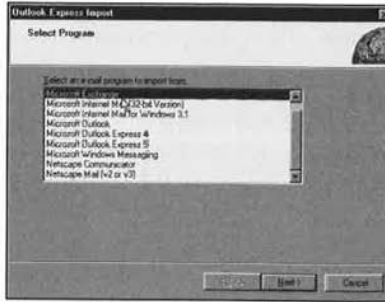
But, transferring your Contacts folder from Outlook 2000 to the Windows Address Book in Outlook Express requires you to go through a cumbersome conversion process that starts by exporting the Contacts information into an Exchange-compatible Personal Address Book (PAB). Then, you can import the PAB into Outlook Express. Follow these steps:

1. Open Outlook 2000; choose File, Import and Export; and select Export to a File. Click the Next button.

2. Following the wizard's prompts, choose Comma Separated Values (Windows) from the list of export formats and then click Next. Select the Contacts folder and click Next. Name the export file and click Next again. Outlook gives you the option to map any custom fields; if you have none, choose Next again and then click Finish.

3. When you click Finish, Outlook 2000 copies the information to the Comma Delimited File in the location you specified.

4. Open Outlook Express; choose File, Import, Other Address Book; and select Text File (Comma Separated Values) from the list of available formats.

5. Click the Import button to finish the process. Your email addresses and other contact information now appear in the Outlook Express Address Book.

Tip from

EQ

Although this process is complex, the fact that Outlook Express can accept Comma Separated Values (CSV) data enables you to import data from any source that can export a CSV file (such as word processor, database, spreadsheet, and report writing programs) and create an address book from it.

If you have data suitable for use as an Outlook Express address book in another program, consult the program's documentation for the process of creating a CSV file.

If you have an earlier version of Outlook, its export feature works in a similar fashion to Outlook 2000's.

Microsoft flatly states on its Web site that this clumsy, scarcely automatic procedure is the only way to share information between Outlook and Outlook Express, but Pumatech, developer of Intellisync email synchronization software, is developing a "universal" Web-based

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email synchronization that will support all types of email on both desktop and handheld devices. To be informed of progress on this project, sign up at http://www.intellisync.com.

RESTORING OUTLOOK EXPRESS AS THE DEFAULT MAIL CLIENT

Note that you can set up more than one mail program on a system running Windows Me. When you install another mail program, however, it might take over as the default email program that starts when you click the Mail icon on IE5.5's Standard toolbar or click a Mail To: hyperlink on a Web page. To restore Outlook Express as the default mail client, follow this procedure:

1. Start Outlook Express; choose Tools, Options; and click the General tab.

2. Choose the button labeled This Application Is the Default Mail Handler. For news, click This Application Is the Default News Handler. Both of these items also can be set up in Internet Explorer properties, on the Programs tab. Choose Outlook Express as the default email and newsgroup program.

CUSTOMIZING THE OUTLOOK EXPRESS INTERFACE

To alter the basic look of Outlook Express, choose View, Layout. You see a dialog box similar to the one in Figure 26.16.

Figure 26.16
These options produce a layout that closely resembles the Outlook 2000 interface.
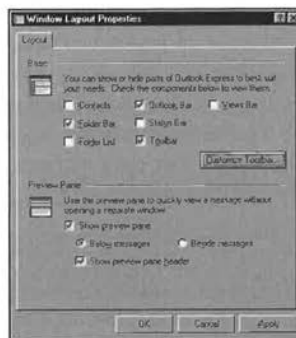
These settings rearrange the Outlook Express interface so that it closely resembles the Outlook 2000 interface, as shown in Figure 26.17. The Outlook bar at left shows all the default folders plus any top-level folders you create; it doesn't include icons for subfolders you create. The Outlook bar also includes icons for news servers and subscribed newsgroups. Just above the message list is the drop-down Folder bar, which shows all folders in an Explorer-style hierarchy.

Figure 26.17
The Outlook bar at left resembles the one in Outlook 2000 with one difference: You can't change the order of icons.
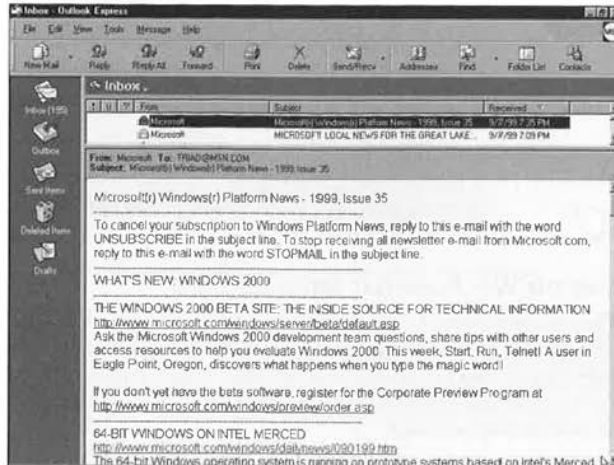
USING THE PREVIEW PANE

As you move between messages in the message list, the contents of the currently selected message appear in the preview pane. Use the layout options to change the appearance and behavior of this pane:

- To toggle the preview pane on and off, choose View, Layout and click the Use Preview Pane checkbox.

- To move the preview pane, choose the Below Messages or Beside Messages option in the Layout properties.

- To show or hide the address and subject line in the preview pane, check the box labeled Show Preview Pane Header in the Layout properties.

- To change the size of the preview pane, point to the bar between the message list and the preview pane until the mouse pointer becomes a double-headed arrow, and then click and drag.

Tip from

EQ

When a message enters a folder in Outlook Express, such as the Inbox, each new entry in the message list appears in bold to indicate you haven't yet read it. The unread status changes when you open the message or, by default Read settings, when it has appeared in the preview pane for more than five seconds. To filter the message list so it shows only unread messages, choose View, Current View, Unread Messages. To change the setting that controls a message's read status, choose Tools, Options and then click the Read tab. Enter a different number in the Message Is Read After Being Previewed for *(number)* Seconds; alternatively, uncheck the box, and the message remains as new until it has been fully opened.

Note

If the settings for the Preview Pane can't be selected, open your Inbox. Preview Pane settings can be changed only when the Inbox is open, enabling messages to be seen and previewed.

Tip from

EQ

To quickly navigate to support on the Web, open the Help menu and select Microsoft on the Web to choose from support, feedback, update, and other options.

CHANGING THE WAY PLAIN-TEXT MESSAGES LOOK

When you receive an HTML-formatted message, the formatting codes in the message itself control how it looks in the preview pane and in individual Message windows. If the message doesn't specify font information, Outlook Express uses default fonts and sizes to control the display of proportional fonts (used for general text) and fixed fonts (used for tabular material that must line up precisely).

When you receive a plain-text message, Outlook Express displays it using the default proportional font and the default font size. On most systems, that means plain-text messages appear in Arial, using the Medium size setting (12 point). Follow these steps to change the font and font size to improve readability or to see more text in a Message window:

1. Open any plain-text message and choose View, Text Size. Select the size you prefer from the five available choices. Note the size and close the Message window.

2. From the main Outlook Express window, choose Tools, Options.

3. Click the Read tab and then click the Fonts button in the Font Settings box.

4. To change fonts, use the Proportional Font drop-down list. (Adjusting the Fixed-Width font setting affects only HTML-formatted messages.)

5. To change to the default font size you noted earlier, use the Font Size drop-down list.

6. Click OK to save your changes. You might need to close and restart Outlook Express to see the font changes in both the preview pane and individual Message windows.

CUSTOMIZING THE OUTLOOK EXPRESS TOOLBAR

To change the look of the Outlook Express toolbar, choose View, Layout. To add, remove, and rearrange buttons, click the Customize Toolbar button; you can also open the Customize Toolbar dialog box, shown in Figure 26.18, by right-clicking the toolbar and choosing Customize from the shortcut menu. Here you can use the drop-down list to hide the text labels and choose small icons to dramatically reduce the amount of space the toolbar takes up.

Figure 26.18
Use the Add and Remove buttons to rearrange the toolbars for Mail and News windows.
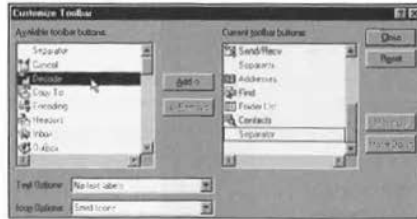
Mail and newsgroups use the same toolbar, as well as the same font settings.

Tip from

EQ

If you use the Folders list regularly but don't want to sacrifice the screen real estate it demands, add the Folder List button to your toolbar. It acts as a toggle, revealing or hiding the Folders list so you can have more room for the message list and preview pane and still navigate between folders without having to wade through pull-down menus.

USING SIGNATURES

For daily use, especially in a business setting, you can create a standard signature to ensure important information goes out with every message you send. A signature might include your name, return email address, company affiliation, and telephone number, for example. At some companies, employees routinely add a disclaimer stating that the views expressed in email messages are personal opinions and do not represent the company.

To set up a personal signature, choose Tools, Options and click the Signatures tab. You can compose a simple text signature, similar to the one in Figure 26.19. You can store your signature in a text file if you prefer, or use an HTML editor to add graphics and formatting codes, and then store the result in an HTML file. To use a file as your signature, choose the File option and specify its location.

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Note

If you normally or always send mail in plain text, don't bother with creating an HTML version of your signature; plain text will work with either a plain-text or HTML-format message.

Checkboxes on the Signature tab enable you to specify whether you want Outlook Express to automatically add the signature to every message you create. An option to skip signatures on replies and forwarded messages is also available. Leave both checkboxes blank if you prefer to add a signature to selected messages only. The Advanced button brings up the advanced signature options, where you can set options that signatures will be added only to messages sent from certain accounts (that is, mail, news, or both).

To add a signature to a message while composing it, choose Insert, Signature on the file bar menu.

Figure 26.19
Netiquette dictates
that signatures should
be short and to the
point. At four lines,
this signature is long
enough.
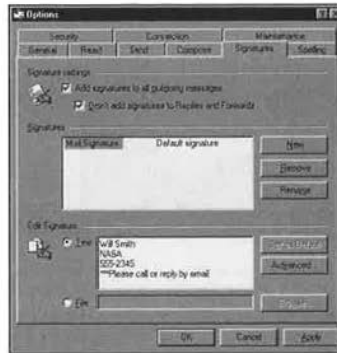
EXPERT EMAIL MANAGEMENT TIPS

This section shows you how to make Outlook Express "smarter" by showing you Outlook Express features that streamline and automate the process of handling your daily flood of email.

COLLECTING MAIL AUTOMATICALLY

If you have a LAN connection, Outlook Express automatically checks for new messages and sends outgoing mail every 30 minutes. To check for mail more or less frequently, follow these steps:

1. Choose Tools, Options and click the General tab. You see the dialog box shown in Figure 26.20.

Figure 26.20
On a LAN connection,
Outlook Express
checks for new mail
every 30 minutes. To
pick up messages
more frequently,
adjust this setting to 5
or 10 minutes instead.
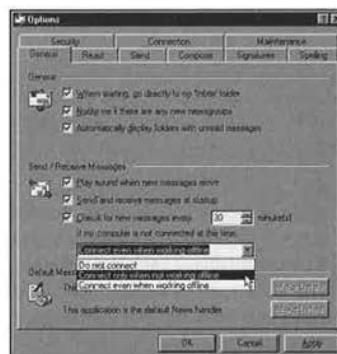
2. Make sure there's a checkmark in the box labeled Check for New Messages Every x Minute(s).

3. Use the spinner control to adjust how often Outlook Express sends and receives mail. This number must be in the range of 1 (every minute) to 480 (every 8 hours).

4. Click OK to make the change effective.

How do you know when new mail has arrived? Outlook Express gives you two cues when you receive mail. A letter icon appears in the System Tray at the right of the taskbar, and the program also plays a sound. If you find the sound distracting, it's easy to kill the noise. Choose Tools, Options; click the General tab; and remove the checkmark for the Play Sound When News Messages Arrive option.

You also can choose a different sound file to play when new mail arrives. Open the Control Panel and use the Sounds applet to assign a different WAV file to the New Mail Notification event. Don't like any of your choices? Create a new sound with the Sound Recorder applet.

→ If you like to "hear" your mail arrive, **see** "Changing System Sounds," **p. 203**

Tip from

EQ

As Outlook Express checks for mail, look in the status bar for messages that display the results of the connection and mail send/retrieve attempt. If you need more information, double-click the icon at the far right to display a dialog box with more details, including any error messages you might have received. Don't ask for too much, though; most errors merely reflect the inability to log on or connect to the POP3 server.

CHECKING THE MAIL FROM ANOTHER COMPUTER

Outlook Express lets you file and save all the messages you send and receive. But what happens when you need to read your email from a machine other than the one you normally use? This might be the case if you normally use an office PC but occasionally check your email from home or the road. If you use the default settings, you end up with a collection of messages scattered across multiple PCs.

The cure is to adjust the account settings on your "away" PC so that it downloads messages but does not delete them from the mail server. Later, when you return to the office, you can connect to the server and download all the messages, saving and filing the important ones.

You must specifically set this option for each account you intend to check. Choose Tools, Accounts; select the account; and click the Properties button. Click the Advanced tab and then check the Delivery options shown in Figure 26.21.

Figure 26.21
If you check your mail when you're away from the office, tell Outlook Express to leave messages on the server so you can retrieve them when you return to work.
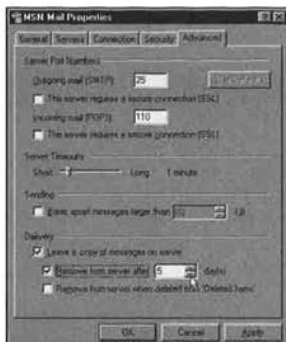
The other two Delivery options help you avoid cluttering up the mail server by automatically deleting messages after a set number of days or when you delete them from your "away" machine.

Tip from

EQ

If you want to keep some of your email messages on a service such as Hotmail or other Web-based email for immediate access, make sure you're not connected to the Internet when you configure Outlook Express to work with your email account. If you have an "always on" connection or if your dial-up connection is running, Outlook Express will pull all your email off your email server as soon as you complete configuring the new account.

To enable the Keep messages on server option for an "always on" DSL or cable modem connection *before* all your messages can be removed from your mail server, follow these steps:

1. Turn off your computer.

2. Disconnect your network cable.

3. Turn on your computer and create your email account; set the delivery options to Leave mail on server.

4. Shut down your computer.

5. Reattach the cable.

6. Restart your computer and open Outlook Express.

7. Your new email account will display your email messages and keep them on the server.

DEFINING RULES TO PROCESS MAIL AUTOMATICALLY

In some busy organizations that live and die by email, workers can receive dozens or even hundreds of messages per day. Managing that torrent of messages can be a full-time job, but Outlook Express can do at least part of the work. The secret is a tool called Message Rules, which lets you define rules for Outlook Express to follow when you receive new mail.

To define mail rules that automate mail processing, choose Tools, Message Rules and then choose Mail from the list of options. The New Mail Rule dialog box appears, as shown in Figure 26.22.

Figure 26.22
To create a mail-processing rule, define one or more criteria in the top of this dialog box and then select an action to be performed when a message meets that condition.
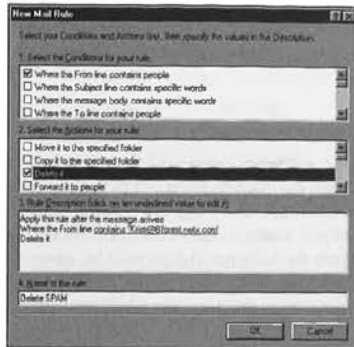
Each rule consists of two parts: a set of criteria and a matching action. Each time a message arrives in your Inbox, Outlook Express compares the message with the conditions defined in your Message Rules; when it finds a match, Outlook Express performs the action defined for that rule.

You can define a variety of conditions to trigger mail actions:

- Search for text in the address box, subject line, or message body
- Look for messages that come from a specific mail account or for a message that is From, To, or CC'd to specific people
- Look for priority or secure messages
- Look for messages that have attachments
- Check the size of each incoming message
- Apply the rule to all messages

When a message meets the conditions you define, you can order Outlook Express to move or copy it to a folder, forward it to another recipient, reply automatically with a saved message, leave the message on the server, or delete the message from the inbox or server. Other options in Outlook Express 5 include highlighting a message in a specific color; flagging it; and marking the message as read, watched, or ignored. Another option tells Outlook Express to stop processing other rules when a specific condition is met.

Note that rules are applied in the order in which they appear in your list. If two or more conditions apply to the same message, only the first rule may be applied in some cases. This could result in the incorrect handling of an important message. This type of conflict between rules can produce effects you didn't anticipate:

- To adjust the order in which the Message Rules are applied, select a rule from the list and use the Move Up and Move Down buttons.

- To completely eliminate a rule, select it and click the Remove button.

- To temporarily disable a rule without eliminating it, clear the checkbox to the left of its entry in the list.

- To change the conditions or actions associated with a rule, select it and click the Modify button.

Tip from

EQ

To clean up a cluttered mail folder, create a rule for specific email addresses to be moved to special folders (for example, by project or personal versus work) or for certain messages to be deleted. When the rule appears in the Message Rules list, highlight the rule you want to apply to your existing messages and then click the Apply To button. Pick the appropriate folder from the dialog box that pops up. For example, if you want to apply the rule to messages in your inbox, choose Inbox. The Message Rules processes all the messages in the folder that you select and any subfolders it contains.

→ To learn how to make folders in Outlook Express, see "Creating a New Folder," p. 683

Figure 26.23 shows some rules you might find useful for weeding out junk mail and for helping to identify important messages.

Figure 26.23
Use Message Rules to help identify important messages and eliminate junk mail.
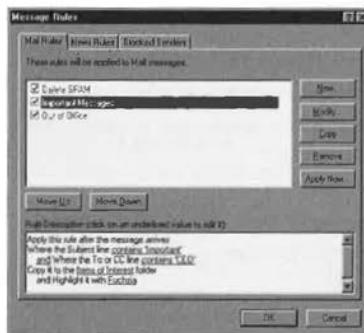
Here are examples of some rules you can create to help you organize your email:

- Automatically move mail sent by a VIP or from your company's domain (mcp.com, for example) to a special Read Me Now folder.

- Look for messages where your name is in the CC field and move them to a Read Me Later folder.

- When you're out of the office on business or on vacation, use a Message Rule to forward all your mail to an assistant and send an advisory message to the sender.

- If space on your notebook computer is tight or you have a slow Internet connection, tell Outlook Express not to download messages that are larger than a specified size—for example, 100KB. You would still see the message header, but not the entire message until you overrode the rule for that message.

FINDING, SORTING, AND GROUPING MESSAGES

Using rules to help you sort your incoming email is part of what you must do to manage your electronic correspondence. You also need to know how to find, sort, and group messages manually by using folders. Creating custom folders should also be performed before you create rules that will use such folders.

ORGANIZING MESSAGES WITH FOLDERS

By default, Outlook Express includes five top-level mail folders. You cannot delete these basic mail folders, which perform the following crucial functions:

- All incoming messages hit the Inbox first; use the Message Rules (see previous section) to file or process messages automatically as they arrive.

- Mail that you've sent goes to the Outbox until the next time you exchange messages with your mail server.

- By default, a copy of every message you send goes to the Sent Items folder. To change this setting, choose Tools, Options; click the Send tab; and uncheck this option.

- When you delete a message, Outlook Express moves it to the Deleted Items folder. An option on the General tab enables you to empty this folder each time you exit Outlook Express. By default, though, this folder keeps deleted messages until you right-click its icon and choose Empty Folder.

- The Drafts folder stores messages you've composed and saved but haven't yet sent.

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CREATING A NEW FOLDER

You can add an unlimited number of top-level mail folders and subfolders to Outlook Express. The easiest way to create a new folder is to follow these steps:

1. If the Folders list is not visible, choose View, Layout; check the box labeled Folder List and click OK.

2. Select the folder in which you want to create the new subfolder. To create a new top-level folder, choose the Outlook Express icon at the top of the Folders list.

3. Right-click the icon you selected and choose New Folder from the shortcut menu.

4. Enter a name for the new folder. (This dialog box also lets you use the tree at the bottom to change the location in which the new folder is created.)

5. Click OK to create the new folder.

MOVING OR COPYING MESSAGES BETWEEN FOLDERS

To move messages, drag them from the message list and drop them on the Folder icon in your Folders list. To copy messages to a folder while leaving the original file intact, hold down the Ctrl key as you drag the messages.

If you use folders extensively, use right-click shortcut menus in the Folders list to move and copy messages. As Figure 26.24 shows, these commands let you create a new folder on-the-fly. Better yet, add the Move To button to the toolbar for instant access to this dialog box.

Figure 26.24
Use the Move to
Folder menu option
to move messages.
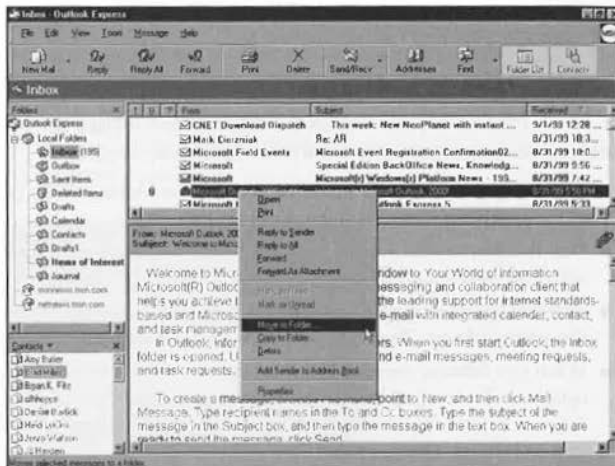
→ To create your own work environment while using Outlook Express, see "Customizing the Outlook Express Toolbar," p. 676

Tip from

EQ

Adding a new top-level folder creates a matching shortcut on the Outlook bar. If you create a folder within an existing folder—under the Inbox, for example—it appears in the Folders list but not on the Outlook bar.

MOVING, RENAMING, AND DELETING FOLDERS

Open the Folders list and simply drag Folder icons to move them from one location to another. Right-click and use the shortcut menus to delete or rename a folder. You can freely move, delete, or rename any folders you create, but you can't change any of the five default mail folders.

Facebook's Exhibit No. 1007 - Page 146

SORTING THE MESSAGE LIST

To sort the contents of the message list, click any column heading. Choose View, Columns to add or remove columns and change the order of those that are displayed. (Note that different types of objects provide different choices of columns.) Click the border between two column headings and drag to adjust column widths.

To group mail or newsgroup messages using threads, choose View, Sort By and toggle the Group Messages by Thread setting.

Icons on the Message window toolbar enable you to save, print, or delete the current message.

To navigate through your entire message list without switching back and forth between the message list and the Message window, follow these steps:

1. Open any message in its own window. Maximize the window if you want to see as much of the message as possible without having to use the scrollbars.

2. To move to the next message in the list, click the up arrow on the toolbar. Click the down arrow to move back to the previous message.

3. To move to the next unread message in the list, press Ctrl+U.

4. In threaded message lists, such as those found in newsgroups, press Ctrl+Shift+U to move to the next unread thread.

5. To move or copy a message to a folder, choose File, Move to Folder or File, Copy to Folder. To delete a message, click the Delete button on the toolbar.

To sort a column such as From or Subject, right-click the column's header and select Sort Ascending or Sort Descending. To group messages from the same person together, sort on From.

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KEEPING SPAM OUT OF YOUR INBOX

Outlook Express gives you two powerful weapons to fight unwanted email, or *spam*:

■ You can create a rule that will move messages to the Deleted Items folder if the subject contains key junk-mail phrases ("make money fast," for example) or if the message was sent by someone from whom you do not want to receive mail (this feature is often called a "bozo filter").

For details on creating this type of rule, see "Defining Rules to Process Mail Automatically," (page 680), earlier in this chapter.

■ You also can block a specific sender's messages with the Blocked Sender's List and the Block Sender, Message menu option.

When unwanted email reaches your inbox, select the message and choose Block Sender from the Message menu list. All existing and any future mail from that sender will be deleted from your mail server automatically; it will never reach your Outlook Express inbox.

You can also add people manually to your Blocked Sender's list by choosing the Block Sender tab from the Tools, Message Rules dialog box and clicking Add.

BACKING UP YOUR MESSAGES AND ADDRESS BOOK

Backing up message folders in Outlook Express isn't like backing up ordinary folders on a hard disk or network drive. Each message "folder" is really an individual file with an extension of DBX.

These folders might be in various locations on your system, depending on such variables as

- Whether or not you have enabled user profiles on your system
- Whether or not you use different identities with Outlook Express

Figure 26.25 shows the results of searching for DBX files (mail folders) on a system. Some folder names are repeated because this installation of Outlook Express has two identities. Each set of "folders" for an identity is stored in a regular drive folder called Outlook Express.

Figure 26.25
Each "folder" in Outlook Express is really a DBX file. Each file should be backed up to a removable-media drive. Note the size of the first Inbox.dbx file.
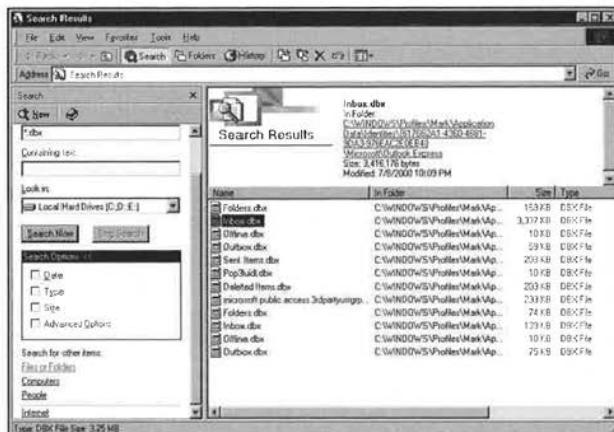
To back up these files, you must locate them, and then transfer them to a disk, removable-media drive, or other type of storage.

Earlier in this chapter, you learned how to create folders and about the rules and techniques for automatically or manually sorting email into various folders. In Figure 26.25, you can see the benefit of such rules and methods. The 3,337MB Inbox.dbx file contains more than 360 messages. If the original Inbox contents were distributed to folders, it would be easy to back it up with ordinary 1.44MB floppy disks, but in its current form, it's far too large to fit on a single disk.

COMPACTING FOLDERS TO REDUCE THE SIZE OF YOUR MAIL FILE

As you receive new messages and organize them into folders, the size of your mail file grows. When you move and delete messages, Outlook Express removes the messages but leaves the empty space in the mail file. Over time, this practice can cause your mail folders to waste a significant amount of space. To eliminate wasted space in a single folder, select its icon and choose File, Folder, Compact. To remove slack space from every mail folder, choose File, Folder, Compact All Folders.

Outlook Express will compact folders and messages only on your command, so you should periodically take time to perform this maintenance task.

Tip from

Before you compact your mail folders, you should back up all your mail files. You also might want to export your messages and address book to another location using the File, Export menu choice. To locate the mail files, click the Start menu; choose Search, Files or Folders; and search for the data files for each folder as seen in Figure 26.22.

After compacting the email folders, back them up again to different media.

WORKING WITH FILE ATTACHMENTS

In addition to formatted text and graphics, you can attach a file to any message you compose using Outlook Express. Binary files, such as images and programs, can safely travel across the Internet, but only if you encode them into ASCII text before sending. When an incoming message includes an attachment, Outlook Express and other multipurpose Internet mail extensions–compatible (MIME) mail clients are capable of converting the encoded text back into binary files.

To add a file attachment to a message you're composing, click the Paper Clip icon on the toolbar. You also can attach one or more files by dragging them from an Explorer or Folder window into the Message window. Or, you can click Insert and select File Attachment from the menu.

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Caution

Not all mail client software is capable of decoding all attachment formats. If you're certain the recipient uses Outlook Express or another modern, MIME-compatible program, you should have no problem exchanging attachments. If you're not certain which mail software the recipient uses, try sending a small test attachment to verify that the process works before you send important files via email.

To view or save a file attachment in a message you've received, look for its icon:

- In the preview pane, click the Paper Clip icon at the right of the preview header to see a list of attached files. Choose an item from the list to open it; you can't save an attachment from the preview pane.

- In a Message window, look for file icons in the header, under the Subject line, as shown in Figure 26.26. Double-click to open the file or use right-click shortcut menus to save the file to your local hard disk or a network location.

Figure 26.26
Right-click a file attachment's icon to open, save, or print it. When composing a message, you can also right-click to add or remove files.
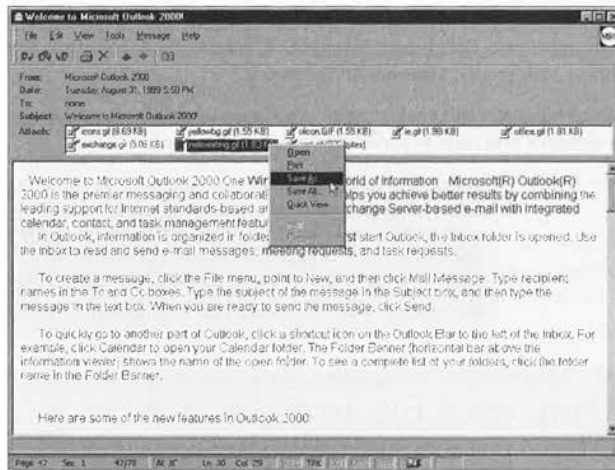
⚠ *If your attachments are not being received properly, see "Text Encoding" in the "Troubleshooting" section at the end of this chapter.*

Caution

Backing up your email messages does not back up any file attachments sent with them. These attachments should be saved to disk and backed up separately.

ENHANCING EMAIL SECURITY

By its very nature, an ordinary email message is as insecure as a postcard. It takes only the most rudimentary technical knowledge to "spoof" a message so that it appears to be coming from someone other than the actual sender. In fact, a favorite hacker trick is to send bogus mail messages that appear to have come from famous individuals such as Bill Gates. And because email travels in packets across the Internet, it's theoretically possible for anyone to intercept a transmission, read a message sent to someone else, and possibly change the contents of that message.

Outlook Express includes two features that enhance email security, although neither offers foolproof protection from a skilled and determined data thief. *Encryption* lets you encode the contents of a message so that only a recipient with a matching code key can decipher the text. A *digital signature* tacked onto the end of a message guarantees that the message originated from the sender and has not been tampered with in transit.

Before you can use either security feature, you must acquire a digital certificate from a certifying authority and add it to Outlook Express. You also must enable that certificate for every mail account with which you plan to use it, as shown in Figure 26.27.

Figure 26.27
Before you can encrypt or digitally sign an email message, you must enable a certificate like this one. Note that "weak" encryption (less than the bit level you specify) will trigger a warning.

To install your digital ID, follow the instructions provided by the certificate provider. The certificate includes two parts: a *public key*, which you distribute freely to others, and a *private key* that only you have access to. Anyone can encrypt a message using your public key, and after they've done so, only you can unscramble it using the private key.

SENDING A DIGITALLY SIGNED MESSAGE

To add a digital signature to a message, click the Digitally Sign Message button on the toolbar in the New Message window. A red and yellow wax-seal–shaped icon next to the From: address line lets you know you are sending a digitally signed message.

> **Caution**
>
> Outlook Express includes the option to digitally sign and encrypt all your messages. Don't activate this feature unless you're certain most of your correspondents use mail software that can accept digital certificates. For the overwhelming majority of email users, it's best to choose secure email options one message at a time.

If you do not have a digital signature yet and you attempt to send a digitally signed message, Outlook Express automatically opens Internet Explorer 5.5 and connects you with Microsoft's "Where to Get a Digital ID" Web site.

While not free, Digital IDs are inexpensive, and with the new Federal law that permits electronic contracts to be legally binding without signatures on paper, it's a good time for everyone to get theirs now.

ENCRYPTING A MESSAGE

To scramble a message so that only a trusted recipient can read it, click the Encrypt Message button in the New Message window. A blue padlock icon next to the To: address box lets you know the message is encrypted. You must have a copy of the recipient's public key before you can encrypt a message to that person. (You can ask a correspondent to send

you his or her public key; you also can find public keys on some directory servers and trusted Internet sites.) See Figure 26.28.

Figure 26.28
A digitally signed and encrypted message— just look for the wax-seal and padlock icons to the right of the address lines.

Pretty Good Privacy, Inc., has one of the best online sources of information about encryption and secure email. You can find it at

http://www.NAI.com

READING A SIGNED OR ENCRYPTED MESSAGE

Anyone can encrypt a message and send it to you, as long as the sender has a copy of your public key. When you receive the encrypted message, Outlook Express uses your private key to unscramble the text so you can read it. When you receive a digitally signed message, you see an introductory message similar to the one in Figure 26.29.

Figure 26.29
Outlook Express offers this help screen when you receive a digitally signed message. Note the additional information in the address header, too.

TROUBLESHOOTING

RECEIVING EMAIL

I can't receive messages from (or send messages through) my email server, even though my Web connection is working correctly.

Correct email account configuration is essential to the operation of Outlook Express 5. Some of the most common errors to look for include

- **Incorrect names for the incoming and outgoing email servers**—Normally, the names of the servers are different; contact your ISP or network administrator for the correct names to use.

- **Incorrect email server type**—Most ISP email accounts use a POP3 server; corporate email uses either POP3 or IMAP; and Web-based services such as Hotmail use either HTTP or POP3. Contact your email provider for the correct server type to specify.

- **Incorrect username or password**—With ISP email, this is usually the same username and password you use to log on to the Web; others vary.

- **Incorrect selection of SPA**—Use Secure Password Authentication (SPA) only when your email provider requires it.

TEXT ENCODING

Some recipients complain that all my paragraphs appear as a single long line or that my messages are filled with equal signs.

Mail format options control how Outlook Express encodes your messages using *Multipurpose Internet Mail Extensions (MIME)*. Quoted-printable MIME replaces line endings and special characters (such as accented vowels) with an equal sign and an optional numeric code. This technique enables you to send some formatting information using ASCII characters. Your recipients are seeing this encoding through a mail reader that isn't fully compliant with the MIME standard. If they're unable or unwilling to switch to another mail client, choose Tools, Options; click the Send tab; and click the Settings button to the right of the mail format you've chosen. Change the Text Encoding option to None, and the problem should disappear; unfortunately, you also lose the ability to use extended ASCII characters.

EMAIL GIBBERISH

My recipients report that file attachments appear as gibberish in messages they receive from me.

Your recipients are probably using a mail client that is not fully MIME compatible, or their ISP's mail server can't process the attachments correctly. If you can't convince your recipients to change mail clients, try resending the attachment using the uuencode format instead of MIME encoding. You must send the message as plain text; choose Tools, Options; click the Send tab; and click the Settings button opposite the Plain Text option to adjust the format for outgoing attachments. Many older mail clients that don't handle MIME formatting

can process uuencoded attachments just fine. If that still doesn't work, your recipients need to find a third-party program that can decode attachments: Some free and shareware programs can help convert MIME-formatted and uuencoded text to its original binary format.

→ For information on third-party free and shareware programs to unencode MIME files, **see** "Secrets of the Windows Masters: Using WinZip Shareware to Decode MIME Files" as follows.

SECRETS OF THE WINDOWS MASTERS: USING WINZIP SHAREWARE TO DECODE MIME FILES

From time to time, you might receive an email message with a MIME-converted attachment. This can happen when the sender's ISP uses MIME conversion to encode and compress multiple attachments sent across the Internet from its email server.

A MIME file is structured much like a Zip file. You cannot "read" it because it is actually a wrapper around a collection of files. For example, if a sender attaches two JPEGs and a letter in a *.doc format to an email message and the sender's ISP uses MIME encoding for multiple attachments, the attachment you receive will actually be a single *.mim file in which the three original files are wrapped. Before you can open either JPEG or the document, you must unwrap the MIME file with a MIME decoder.

A popular shareware application that fulfills this need is WinZip 8.0. You can download a free evaluation copy from the WinZip Internet site at http://www.winzip.com. After your evaluation period is over, you can pay $29 to register your copy.

WinZip includes long-filename support and integration with the Windows Me environment, making the program part of the right-click menu for any file in Windows. One of many new features added to version 8.0 is Zip and Email, which can automatically email a Zip compressed file as soon as you create it. As a writer who sends plenty of Zip-compressed files, this feature alone makes trying the new WinZip a must.

I believe that WinZip is the best product on the market for the money. Unlike other decoders, such as Wincode, which deal exclusively with encoded/decoded files, this application not only decodes MIME files but also compresses, or zips, files for you to send from your computer. In fact, it has built-in support for almost all popular Internet file formats as well as the CAB files used to store most of Windows Me's program and driver files. If you have a format you are not sure of, visit the WinZip Web site and search for it. Chances are, WinZip can handle it. Other attractive WinZip features include

- A freely downloadable WinZip Internet Browser Support Add-On that enables you to download and open archives with one click using Microsoft Internet Explorer or Netscape Navigator.
- An automatic installation of most software distributed in Zip files. For example, if a Zip file contains a setup or install program, WinZip's Install feature unzips the files, runs the installation program, and cleans up temporary files.

- The WinZip Wizard, an optional feature that uses the standard and familiar wizard interface to simplify the process of unzipping and installing software distributed in Zip files. The WinZip Wizard is ideal for the rapidly growing number of PC users just learning to use Zip files.

- The Favorite Zip Folders, a feature that enables you to organize Zip files into one convenient list, sorted by date. This practice makes locating all your Zip files, regardless of where they came from or where they are stored, much easier. Also, a Search facility finds any Zip files lost on your hard disk.

- The WinZip Self-Extractor Personal Edition that enables you to create files that unzip themselves. Self-extracting files are ideal for sending compressed files to others who might not own or know how to use file-compression software.

- Virus-scanner support that can be configured to work with most virus scanners.

Special Edition

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- Hands-on networking coverage that walks you through every aspect of setting up a home or small-business peer-to-peer network—including installation of network interface cards, hubs, and cabling. I provide a total solution for setting up and maintaining a simple file- and print-sharing network.

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- Learn how to reliably record your own CDs using CD-R or CD-RW drives. Configure finicky Windows and hardware settings to record your own music and data CDs.

- Master MP3 technology to record, store, and take your MP3 audio files on the road. This hot technology enables readers to record their favorite audio tracks to their hard drive and use their computer as a jukebox.

- Track down and resolve IRQ and DMA conflicts that prevent your new scanner, digital camera, or Zip drive from working. I show you how to fine-tune your system resources so that all your hardware devices are recognized, and I show you how to deal with plug-and-play devices that can be anything but playful.

- Tired of reclaiming stolen file associations from unruly Windows applications? I show you things about Microsoft's confusing file association scheme that you've never seen before, and I show you how to regain control.

s an award-winning computer nd one of the widely voices in the computing nearly two decades of as a writer and editor at gazines such as *PC World* *omputing*. Currently, he is contributing Editor for *Smart Business* (formerly *PC Computing*), a 1999 National Magazine Award winner with a monthly circulation of more than 1 million. On the Web, Ed authors the Guide to Windows for About—The Human Internet (http://windows.about.com), one of the Internet's leading resources for news, information, and entertainment; he also writes a weekly column for TechRepublic.com. He is the author of a long list of Que books covering Microsoft Windows and Office, including *Special Edition Using Microsoft Office 2000*, *Practical Windows 2000*, *Special Edition Using Windows 98*, *Platinum Edition Using Windows 98*, and two editions of *Using Windows 95*. In all, Ed has reached more than 650,000 Windows and Office users through his unique combination of expert knowledge and friendly, down-to-earth style.

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ISBN 0-7897-2446-4

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