

# Using the Windows Control Panel

As with previous versions of Windows, the Windows 2000 Control Panel is the central hub for making any variety of system changes. Control Panel is a collection of programs called *applets* that form the graphical user interface (GUI) through which most changes to the registry are made. As mentioned in Chapter 4, using the Control Panel applets is the preferred method for making Registry changes. This is due to the ease with which a mistake can be made using the Registry Editor.

Collectively, the Control Panel applets are the most powerful function of Windows 2000, next to the Registry Editor. The reason is that whereas Explorer provides the interface for file and folder manipulation, the Control Panel provides the ability to manipulate any of the hardware in your system, as well as to control the administrative functions of the operating system. In this chapter, we will take a look at the following topics:

- Defining the main applets in Control Panel
- Working with hardware settings
- Working with operating system settings
- Installing hardware

## Defining the Main Applets in Control Panel

With Windows 2000, Microsoft has captured the best of both worlds with respect to the Windows NT 4.0 and Windows 9x (95 and 98) Control Panel applets. For example, Windows 9x users have long enjoyed the Device Manager (located under the System applet) for managing hardware, a feature that Win-

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dows NT users did not have. Windows NT users have long been able to configure their environment variables and startup options through Control Panel whereas Windows 9x users had to edit *config.sys*, *autoexec.bat*, and *msdos.sys* files manually to obtain equivalent functionality. In many ways, Windows 2000 tries to converge the user friendliness of Windows 9x with the power and stability of Windows NT.

Many of the applets are similar to what Windows 9x and NT users have seen in the past. The Display applet is practically unchanged from Windows 98 and eliminates the requirement to click Test in NT 4.0 before applying a new display resolution. Other applets such as Printers, Fonts, Keyboard, Mouse, Date/Time, Power, and Accessibility Options are very similar to what they have been in the past, although in many cases are more wizard-driven than in previous versions of Windows. We'll focus on a few of the most highly used applets as well as a couple of new additions.

### ***Add/Remove Hardware***

Add/Remove Hardware is an updated version of the Add New Hardware applet from Windows 9x and NT 4.0. Add New Hardware, as the name implies, gave users the ability to install and configure new hardware devices. The Windows NT version of Add New Hardware did not include any Plug and Play (PnP) functionality, but rather allowed the user to install manually a device driver included with NT or from a user-provided location ("have disk") after selecting the appropriate category of device that was to be installed such as SCSI controllers or network adapters. Windows 9x gave the user the option of letting Windows search for a PnP device in addition to installing a device driver manually.

The Windows 2000 Add/Remove Hardware wizard includes all of the functionality of the Windows 9x Add New Hardware wizard and more. When you first open the Add/Remove Hardware wizard, you are given a choice of hardware tasks, as shown in Figure 5.1.

The Add/Troubleshoot a device task is similar in function to the original Add New Hardware wizard. First, Windows 2000 attempts to detect a device through PnP, and if it doesn't detect a new device, it presents the option to install a driver manually. Additionally, there is the option to troubleshoot a device, which will be discussed later in this chapter, as will uninstalling and unplugging devices.

### ***Add/Remove Programs***

The Add/Remove Programs applet has a fresh new look to it in Windows 2000, as shown in Figure 5.2, but works the same as it did in NT 4.0.

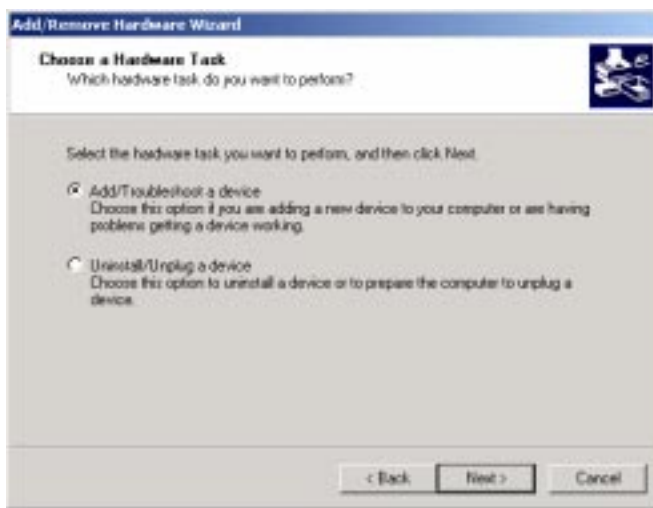


Figure 5-1

*The Add/Remove Hardware Wizard allows the user to perform a variety of hardware-related tasks.*

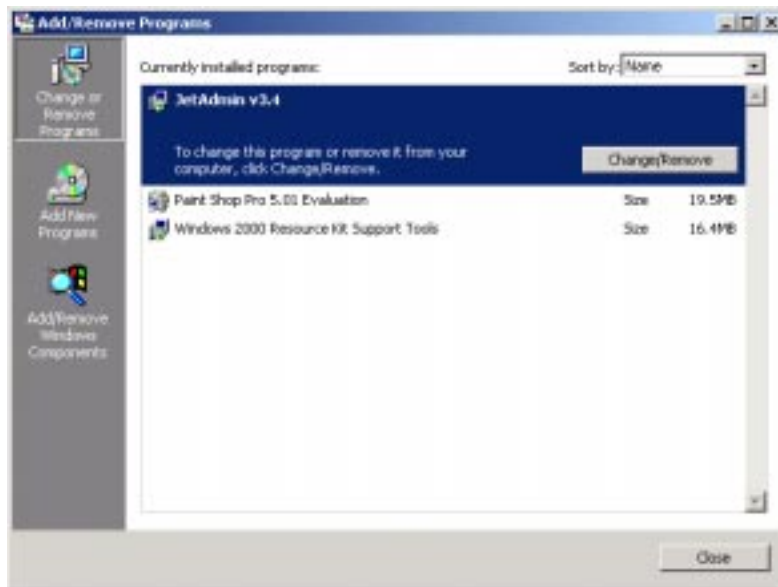


Figure 5-2

*The Add/Remove Programs applet gives a new look to an old standby.*

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### **CHANGE OR REMOVE PROGRAMS**

Change or Remove Programs lets you either uninstall complete applications or add or remove individual components of applications that support that feature. Multifaceted applications, such as office suites, typically allow you to change components of programs without having to remove and reinstall the entire application completely.

### **ADD NEW PROGRAMS**

Add New Programs is another example of an applet that has converged Windows NT and Windows 9x. You can still install new floppy-based or CD-ROM-based applications through this applet, but Windows 2000 has also incorporated the Windows 98 Windows Update utility into Add New Programs. Windows Update is a utility through which you can add new Windows features, device drivers, and system updates over the Internet. This enables you to keep your Windows 2000 operating system up to date as bugs and security holes are found and patched and as Microsoft adds new functionality.

### **ADD/REMOVE WINDOWS COMPONENTS**

Add/Remove Windows Components is where you can customize your installation of Windows 2000. As in NT 4.0, you can add components that were not installed during the initial operating system setup or remove components that you no longer want installed. A difference in Windows 2000 is that Microsoft has moved Networking Services from the Network Control Panel applet in NT 4.0 to the Windows Components wizard of Add/Remove Programs.

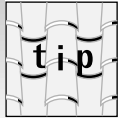


You can still configure additional network services through the Network and Dial-up Connections Control Panel applet by clicking the Advanced menu and selecting Optional Networking Components. This brings up the Windows Components wizard without having to go through Add/Remove Programs first.

### ***Administrative Tools***

An important difference between NT 4.0 and Windows 2000 is that Microsoft has moved the Administrative Tools from the Start menu to the Control Panel. This move is in keeping with the strategy that the Control Panel is the central hub for configuring the operating system. A common complaint with earlier versions of NT was the lack of cohesiveness when it came to administering the system. Tools were scattered here and there and every tool had a different interface. Windows 2000 attempts to address those complaints by providing both a centralized location (Control Panel) and a unified look and feel (Microsoft Management Console [MMC]) to system administration. The Administrative Tools

are implemented as a series of MMC Snap-Ins and will be covered in more detail throughout the book.



For NT 4.0 users who preferred Administrative Tools on the Start menu, it can be added back through Taskbar Properties by checking the Display Administrative Tools check box on the Start Menu Options tab.

### *Users and Passwords*

Users and Passwords replaces the older User Manager (NT Workstation) and User Manager for Domains (NT Server) applets from NT 4.0. In this applet, you can configure user and group settings, and configure whether or not users have to enter a username and password to login or press <CTRL>+<ALT>+<DELETE>. If your network uses a certification authority for authentication, you can manage certificates in this applet, as well.

### *System*

The System applet is host to a wide variety of functions that enables you to configure your computer's settings. System is possibly the most important of the Control Panel applets, so we will look at each of the property sheets that make up the applet. It is divided into five property sheets, as follows:

- General
- Network Identification
- Hardware
- User Profiles
- Advanced

#### **GENERAL**

The General property sheet is the same as in NT 4.0. It provides information such as the version of the operating system, who the operating system is registered to, the license key, and information regarding the processor and amount of RAM installed in the computer.

#### **NETWORK IDENTIFICATION**

The Network Identification property sheet is new to Windows 2000 and is what used to be the General tab of the Network Control Panel applet in NT 4.0.

On this property sheet you can change the name of the computer and configure workgroup or domain membership for your workstation or server.

### **HARDWARE**

The Hardware property sheet is the location for configuring your system's hardware. It includes a button that links to the Add/Remove Hardware applet and, like NT 4.0, gives you the ability to setup and configure multiple hardware profiles (discussed in the next section).



Another exciting new feature of Windows 2000 is driver signing, which attempts to maintain the integrity of the operating system files by allowing you to configure whether or not to overwrite digitally signed files when you install applications. By default file signatures are ignored, meaning that all files will be installed, regardless (the same as NT 4.0). There are also options to warn you before installing an unsigned file or to block unsigned files from installing at all.

Device Manager is the applet that Windows 9x users have had available to them while NT 4.0 users had to rely on the archaic Windows NT Diagnostics that provided much less functionality. Using Device Manager, you can view and change device properties, update device drivers, configure device settings, and uninstall devices.

### **USER PROFILES**

The User Profiles property sheet is where you configure local versus roaming profiles. Profiles are discussed in depth in Chapter 13.

### **ADVANCED**

The Advanced property sheet contains options to configure performance options, environment variables, and startup and recovery options. Each of these is discussed later in this chapter.

## **Working with Hardware Profiles**

Hardware profiles are a feature of Windows 2000 that enables the operating system to have multiple hardware configurations. By default, when Windows 2000 boots, every device driver that is currently installed is loaded into memory. A default profile called *Profile 1* is created during the Windows 2000 installation, and every device installed is enabled during the boot process. For desktop computers, that is usually desirable, but where hardware profiles are especially useful is with notebook computers. Many people have docking stations for using their notebook computer in an office but do not take it with them when they take their notebook home or when traveling. You might have a hardware

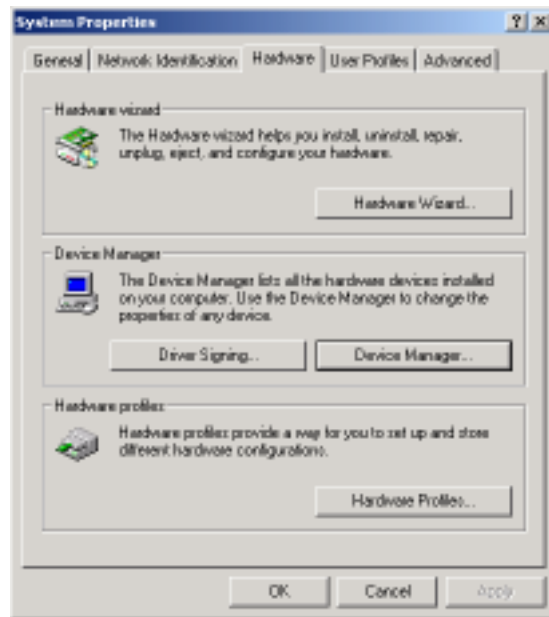


Figure 5-3

*Configuring hardware profiles in Windows 2000 through the Control Panel System applet.*

profile named *Docked* that loads device drivers for a network card and laser printer that are part of your docking station. You could also have a second profile called *Undocked* for use in a hotel room or at home that loads a modem rather than the network card. Although you could just load everything in one profile, regardless of your location, you would end up with error messages logged in the System Log (Event Viewer and logs are discussed in Chapter 26).

### ***Creating and Modifying Hardware Profiles***

As previously mentioned configuring hardware profiles is done through the System applet in Control Panel. After clicking the Hardware tab click the Hardware Profiles button at the bottom. That will bring up the dialog shown in Figure 5.3.

Creating a new profile is accomplished by selecting the generic New Hardware Profile and clicking Copy. Assign a name to your new profile and click OK. The new profile will default to enabling every installed device, so you will likely want to modify the profile to your specific needs. This is done through the Device Manager rather than the Hardware Profiles property sheet. The Device Manager, shown in Figure 5.4, is accessed from the Hardware property sheet of the System applet, just like Hardware Profiles.

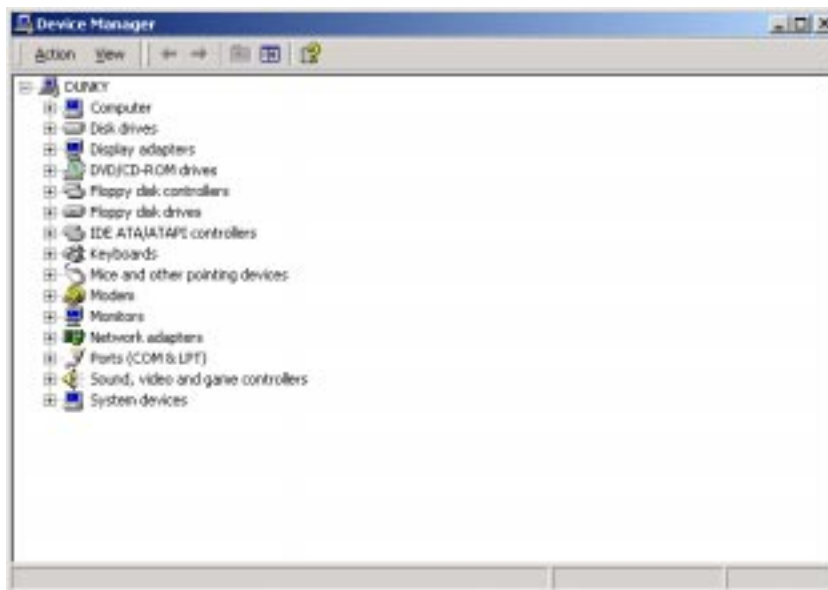


Figure 5-4

*The Windows 2000 Device Manager console enables you to configure settings for hardware devices, including in what hardware profiles the devices should be enabled.*

In Device Manager, a device can be enabled or disabled in a particular profile through the General properties of an individual device. For example, double-clicking on an installed modem will bring up the properties. At the bottom of the General property sheet is the Device Usage option. You can select your desired options from the dropdown list.

### ***Using a Hardware Profile***

If you have only one hardware profile Windows 2000 will, of course, use it every time you boot the computer. However, if you have more than one profile, you have a couple of options as to how Windows behaves during the boot process. As shown at the bottom of Figure 5.3, there are choices for hardware profile selection when Windows starts. By default, Windows will count down from 30 seconds before loading the first profile listed if you do not intervene. You can also have Windows wait indefinitely for you to make a profile selection.

### **VIEWING THE PROPERTIES OF A HARDWARE PROFILE**

However, for this to work, first you have to make the profile available as an option when Windows starts. This is done by highlighting the profile and clicking Properties, which brings up the window shown in Figure 5.5.



Figure 5-5

*Properties of a hardware profile.*

By clicking the Include this profile as an option when Windows starts check box, you can control whether a profile is available for use. This is handy if you no longer need a particular profile but you do not want to delete it right away or if you will be using one particular configuration for an extended period of time and do not wish to have other profiles available during that time. That scenario might take place if you went on an extended business trip where you were not going to be using the docking station back in your office any time soon.

## Working with Operating System Settings

Windows 2000, like NT 4.0, gives you the option to configure settings that affect the behavior of the operating system through the System applet in Control Panel. After opening System Properties, click the Advanced tab to find the operating system settings. Configurable options include:

- Performance Options
- Environment Variables
- Startup and Recovery

### *Performance Options*

Performance options give you the ability to control how applications use memory. When you click on the Performance Options button, you are presented with the window shown in Figure 5.6.

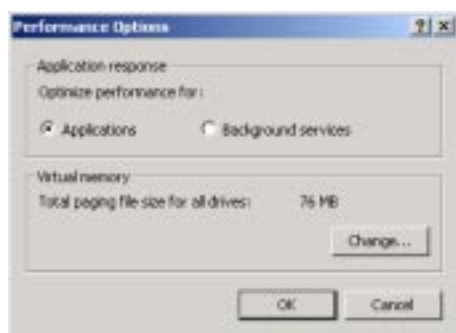


Figure 5-6

*Configuring Windows 2000 Performance Options.*

The first option on this property sheet is for application response. By default, Windows 2000 will optimize performance for applications, rather than background services. Windows 2000 manages system processing, which includes allocating processor time to processes that are running. The operating system can allocate tasks between multiple processors or multiple processes on a single processor. Choosing the Application Response preference, however, allows you to decide whether Windows should give more processor time to the programs you are working in or to background tasks, such as printing. Setting the response to favor applications will result in a faster response time from the application you are actively working in, which is generally the desired option. A print server, though, would be set up to favor background tasks, rather than active applications because the majority of the server's work would be processing background tasks. Windows 2000, like Windows NT, uses a thread priority process to determine which application to give CPU time and in which order to do it. Windows 2000 does this on a scale of 1–31, with 31 being the highest priority and 1 being the lowest. Table 5.1 shows a list of the thread priorities.

Table 5.1

Thread Priorities in Windows 2000

Base	Priority Class	Thread Priority
31	Real-time	Time critical
26	Real-time	Highest
25	Real-time	Above normal

Table 5.1

Thread Priorities in Windows 2000 (Continued)

24	Real-time	Normal
23	Real-time	Below normal
22	Real-time	Lowest
16	Real-time	Idle
15	Idle, Normal, or High	Time critical
15	High	Highest
14	High	Above normal
13	High	Normal
12	High	Below normal
11	High	Normal
10	Normal	Highest
9	Normal	Above normal
8	Normal	Normal
7	Normal	Below normal
6	Normal	Lowest
6	Idle	Highest
5	Idle	Above normal
4	Idle	Normal
3	Idle	Below normal
2	Idle	Lowest
1	Idle, Normal, or High	Idle

An obvious question would be, If Windows 2000 gives CPU time to the highest priority app, how are lower-priority apps ever executed? Good question! Windows 2000 dynamically adjusts the priorities, boosting lower priority applications so that, eventually, as the CPU continues to multitask, the application gets to use some CPU time. This process works very quickly, so even lower-priority apps will respond within a reasonable amount of time.

### **VIRTUAL MEMORY**

The second configurable performance option is virtual memory, shown in Figure 5.7.

When Windows runs low on available RAM and needs more memory to complete a task, it uses the hard drive to simulate system RAM. This is called *virtual memory* and is much slower than system RAM because hard drive

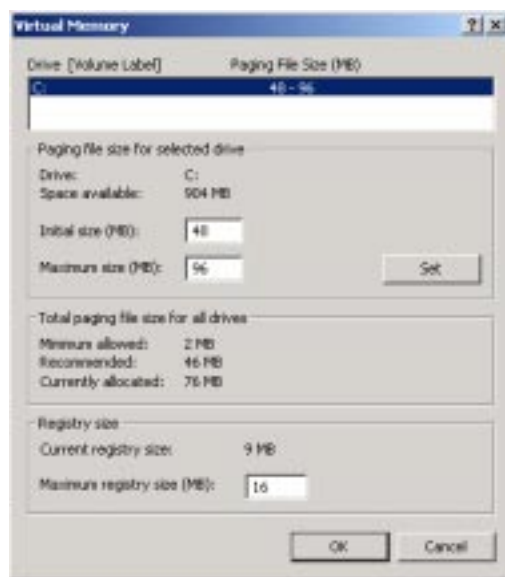


Figure 5-7 The Virtual Memory property sheet.

speeds are measured in milliseconds, whereas RAM is measured in nanoseconds. Another name for virtual memory in Windows 2000 is the *pagefile* and, in fact, Windows creates and uses a special file called *pagefile.sys* for virtual memory.

The default size for the pagefile in Windows 2000 is the amount of system RAM plus 12 MB. So a system with 128 MB of RAM would initially have a *pagefile* of 140 MB. For a basic workstation or server, this number might be appropriate, but servers running other Microsoft BackOffice applications, such as Exchange Server or SQL Server, usually need to increase the default virtual memory size. Refer to the product-specific documentation for recommended virtual memory settings. You set the size of the pagefile by selecting the drive you want the file to be located on, typing a number into the Initial Size box (shown in Figure 5.7) and the Maximum Size box and clicking Set. You will be prompted to reboot after clicking OK. The initial size is just that, the size of *pagefile.sys* when Windows 2000 starts up. The maximum size is how large *pagefile.sys* is allowed to grow during the processing of tasks as the system works.



It might seem advantageous at this point simply to set a pagefile much higher than you need so you will not have to worry about running out of memory. However, Windows 2000 will not efficiently use a pagefile that is too large, resulting in potentially worse system performance than if the virtual memory size had been left at the default settings.

The default virtual memory settings are often not the most efficient, but there are some guidelines that you can use when configuring virtual memory settings.

Windows 2000 sets up the pagefile to be on the boot partition where the operating system was installed. This is inefficient because Windows will, by nature, perform a lot of disk I/O on the system files. Having to read and write to the pagefile simultaneously while doing the same with system files slows Windows down. Therefore, it is recommended that the pagefile be moved to a different physical disk, preferably onto a partition that has no other data or programs that will be frequently accessed. Windows 2000, like Windows NT before it, supports advanced disk configuration options on NTFS partitions, such as disk mirroring and disk striping. These features provide fault tolerance and performance benefits, and are discussed later in this book in a chapter on managing disks.

The downside to moving the entire pagefile, though, is that if Windows crashes, it will be unable to write debugging information to a dump file (discussed later in this chapter). To address that, a pagefile using the default settings should be left on the system partition, and another pagefile should be created on a different physical disk, as outlined above. The Windows 2000 operating system has algorithms that allow it to use multiple pagefiles in the most efficient manner, and, in this case, it will opt to use the pagefile on the less frequently used drive, rather than the one on the system partition. Should Windows crash, though, it would be able to create a dump file for troubleshooting purposes.

In addition to configuring the size of the pagefile you can also configure the maximum size of the registry from the Virtual Memory property sheet. As with the pagefile, you can specify the largest size to which the registry is allowed to grow, and nothing is gained by setting the maximum size artificially high.

### ***Using Environment Variables***

Most current systems administrators can remember the dark days of DOS, where manually editing system files such as *config.sys* and *autoexec.bat* was a way of life. Windows 2000, though, like NT 4.0 before it, provides a convenient GUI for configuring the environment variables that is shown in Figure 5.8.

Environment variables are divided into User variables and System variables. As the name suggests, User variables are specific to the user and, other than TEMP settings, are usually required only for specific applications. System variables are common to the operating system no matter who is logged in. Typically, the settings an administrator might edit under System variables would be the TEMP files folder and the PATH statement. In DOS and Windows 9x, these particular settings were located in the *autoexec.bat* file.

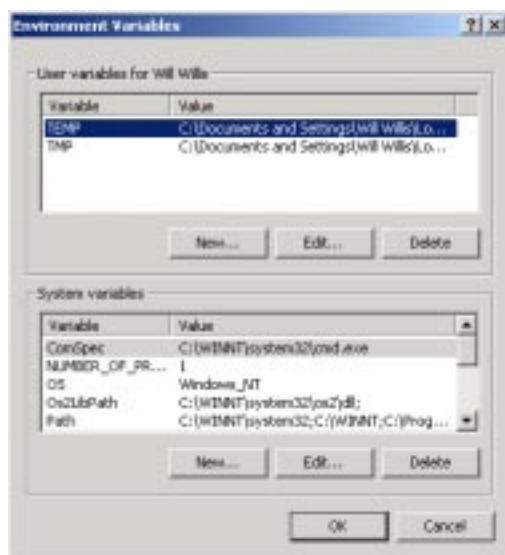


Figure 5-8

*Configuring environment variables in Windows 2000.*

By clicking New, you can create a new User or System variable, and Edit allows you to modify an existing variable, such as to add an additional folder to the PATH statement. Deleting a System variable should be done with great care and only if you are sure of the potential consequences of that setting being removed.

### ***Understanding Startup and Recovery Options***

The Startup and Recovery Options allow you to control the behavior of the system during startup and during a crash. If you have only Windows 2000 installed on your system, it will be the default operating system. It will be the default operating system as well in a dual-boot scenario if it was the last operating system installed. If, for example, you had a Windows 98 system and you installed Windows 2000 as a new installation, you would have the option when the Boot Menu appeared of choosing either OS. The menu by default counts down from 30 seconds before loading the default operating system if there is no intervention. On the Startup and Recovery property sheet, you can tell Windows which operating system should be the default and for how long the menu should be displayed before loading the default.

Although Windows 2000 is generally a stable operating system, there will be times when you experience the infamous “Blue Screen of Death” fatal error. The Recovery options let you determine what actions Windows takes when a fatal error occurs. By default, it will write an event to the system log, but you

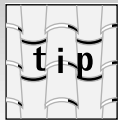
can also have Windows send an administrative alert to a remote user or computer if the alerter service is configured. This is especially helpful to notify system administrators immediately when a server goes down to ensure the quickest response time possible.

Windows can also write debugging information to a dump file, *memory.dmp*. This is enabled by default on Windows 2000 Server but must be manually enabled on Windows 2000 Professional. The contents of the dump file means nothing to most administrators but can be used by Microsoft to help troubleshoot the cause of the crash.

If debugging information is written to a dump file, it is beneficial also to check the box to automatically reboot. If an application caused the fatal error, typically, Windows will start back up without problem. This will enable users to get back to work while you work to determine the specific cause of the crash through the dump file. If the server does not automatically reboot, it will stay at the fatal error screen until someone manually resets the system.

## Installing Hardware

Windows 2000 has made great strides over NT 4.0 in the process of installing hardware, mainly due to the more robust PnP support. NT 4.0 had very limited PnP capabilities through the pnpisa service, but pnpisa supported only a small variety of hardware. Windows 2000 has full-blown PnP support, similar to Windows 98, and supports a much larger variety of hardware than does NT 4.0.



You must be logged into the computer using an account that is a member of the administrators' group to install hardware.

### *Plug and Play Hardware*

A PnP system is one that has a PnP-compatible BIOS, operating system, PnP devices, and PnP-aware applications. If you have a PnP-compatible system, installing PnP hardware is generally pretty simple. Follow the manufacturer's instructions to install the device physically and power up the computer. Windows 2000 should detect your new hardware and start the Found New Hardware wizard. Follow the on-screen prompts to install the appropriate device driver if Windows does not automatically install a driver for you. Windows 2000 comes with a substantial library of device drivers, so in many cases, it will already have a driver that will work with the device you are installing. If Windows does not have a driver, you will be prompted for the location of the driver.

### *Non-Plug and Play Hardware*

If the hardware you are installing is not PnP compatible, also known as a *legacy* device, Windows will not detect it automatically and launch the Found New Hardware wizard. In most cases, legacy devices have physical jumpers on the device or proprietary software utilities that come with the device and are used to configure the hardware settings. Jumpers must be set at the time that the device is physically installed in order for the device to work properly. Installing a device driver for non-PnP hardware is done through the Add/Remove Hardware wizard.

### *Using the Add/Remove Hardware Applet*

As previously mentioned, the Add/Remove Hardware applet builds on the functionality of Add New Hardware in NT 4.0. When you launch the Add/Remove Hardware wizard, it will first attempt to detect PnP devices that might not have been configured. If it does not detect a device, you will be presented with the window shown in Figure 5.9 and given the opportunity to “Add a new device” or troubleshoot a device that already has a driver loaded for it.



Figure 5-9

*Installing a non-Plug and Play device or troubleshooting an existing device is done through the Add/Remove Hardware wizard.*

In a bit of redundancy due to reusing existing NT 4.0 code from its Add New Hardware wizard, Windows 2000 will give you the default choice of searching for PnP devices again when you select Add a new device. Alternatively, you can choose to select your hardware from a list. First, you select the

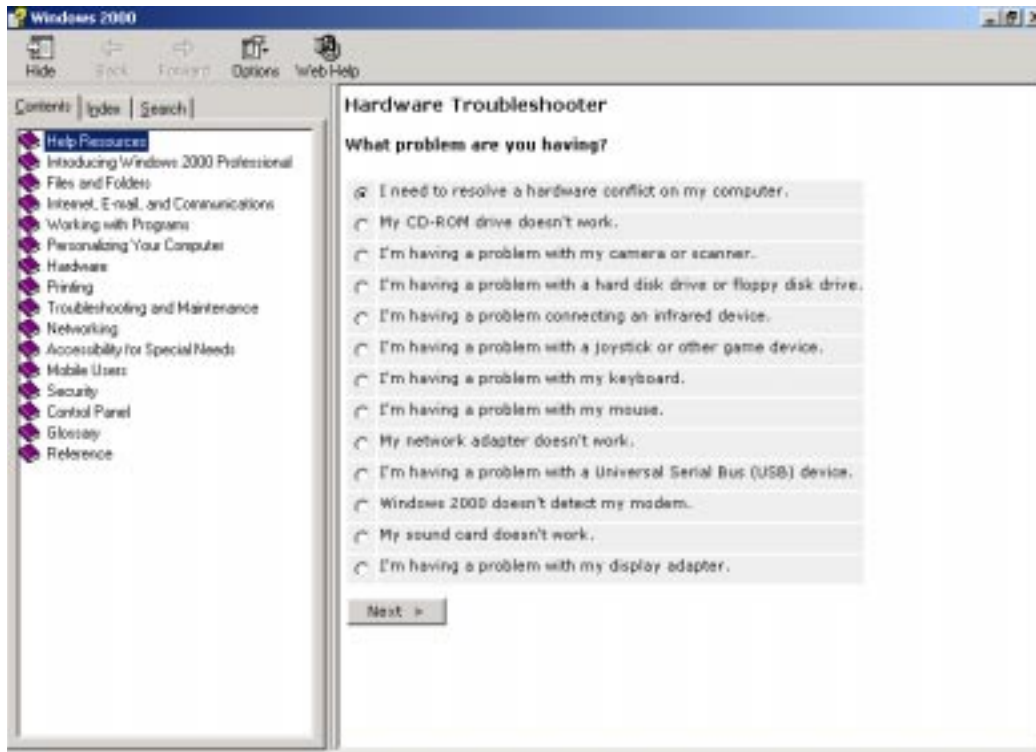


Figure 5-10

*The Hardware Troubleshooter helps you resolve problems with installed hardware.*

category of the device you wish to install, such as Display Adapters, then the specific make and model of the device you are installing. If Windows 2000 does not have a driver for your device you can select Have Disk to point the operating system to updated driver files. Follow the prompts and reboot if necessary to enable your hardware.

### DEVICE TROUBLESHOOTING

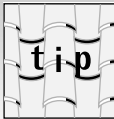
If you are having trouble getting an installed device to work you can use the Add/Remove Hardware applet to launch the Hardware Troubleshooter, shown in Figure 5.10.

Using the Hardware Troubleshooter is a matter of selecting the general type of problem you are having and stepping through a series of questions and suggestions to get your device working. These are the basic troubleshooting steps that a repair tech would take in troubleshooting the problem and, in most cases, will enable you to get your hardware working without having to call the manufacturer's tech support.

### UNINSTALL/UNPLUG A DEVICE

If you want to uninstall a hardware device from your system or unplug a device (most typically associated with notebook computers), you would also use the Add/Remove Hardware wizard. When you select this option, you are given two choices, one to remove a device and the other to unplug/eject a device. When you choose to uninstall a device, you are shown a list of installed devices that can be removed. By default, hidden devices, which are system level drivers usually essential to the operation of Windows 2000, are not shown. Checking the box to Show Hidden Devices makes them appear in the list, but great care should be taken before removing one of these devices. Remove only one if you are sure that the result will be desirable.

Unplugging or ejecting a device is usually related to notebooks and PCMCIA (also known as PC card) devices. Windows 2000 does not directly support *hot swappable* devices, that is, devices that can be added or removed on the fly, where Windows will automatically detect their presence or lack thereof. Going through the unplug/eject option lets you tell Windows that you are about to unplug a device such as a PCMCIA modem from your system. The operating system will then tell you it is safe to eject the device.



If you frequently unplug/eject devices while Windows 2000 is running, you can select the check box to Show Unplug/Eject icon on the taskbar on the Completing the Add/Remove Hardware Wizard page. This will keep you from having to run the Add/Remove Hardware wizard every time.

### Viewing Available Hardware Resources

Figure 5.4 previously showed the Device Manager console, which is the primary interface for viewing and modifying hardware resources. The Device Manager is organized in a tree format, with the top branches representing device categories. Expanding a branch shows devices of that type that are installed on the system. This view is called *Devices by type*. To view available hardware resources in Device Manager, click the View menu and select, Resources by connection. This will divide the console into groups for DMA, I/O, IRQ, and Memory. Expanding the IRQ branch, for example will show you a list of IRQs in use and what devices are using them. This information is also available through the Computer Management administrative tool (Device Manager can also be accessed through Computer Management), but you need Device Manager if you want to do more than just view the resources in use.

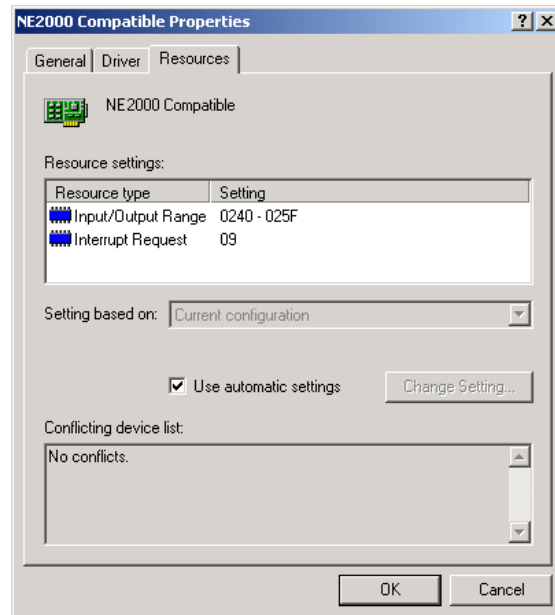


Figure 5-11

*Windows 2000 allows you to configure resource settings for individual devices, useful for setting up non-Plug and Play hardware.*

### ***Altering Hardware Resource Assignments***

The default view in Device Manager is Devices by type, which is the easiest view for modifying hardware resources. To change a resource setting for a device, first expand the branch for the device category, such as network adapters. Then double-click the device you want to modify to bring up the properties. Click the Resources tab to view the current resources for the device. If the Use automatic settings check box is checked, Windows has assigned resources to this device and is managing those resources. This is the preferred method because it allows Windows to juggle any PnP devices to accommodate special resource requirements. If it is a legacy device that requires manually setting the resources, though, you can uncheck the box and adjust the settings to match the hardware. Windows will dynamically update the conflicting device list at the bottom of the window to show you whether a resource you have selected is already in use by another device. Resource configuration is shown in Figure 5.11.

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## Chapter Summary

The Control Panel is the central location for managing operating system settings, hardware, and software. It is organized into a collection of programs called *applets* that contain the options for configuring your system. Microsoft has moved the Administrative Tools from their old location in NT 4.0 to the Control Panel in Windows 2000, further centralizing system management. Whereas many of the applets have similar functionality as in previous versions of Windows, many are updated to reflect the Windows 2000 interface look and feel, and many have added more features. Examples of an applet with new features include Add/Remove Hardware, which now, in addition to the basic add hardware functionality of NT 4.0, also lets you remove hardware easily (a feature borrowed from Windows 9x) as well as unplug or eject devices.

With Windows 2000, Microsoft has married some of the best features of Windows 9x, while building on the foundation of NT 4.0. Functionality such as true Plug and Play and the Device Manager for managing hardware goes a long way toward making Windows 2000 more user-friendly than previous versions of NT.