

Chapter 5

Overview

Windows 9x refers to Windows 95, Windows 95 OEM Service Release 2 (OSR2), Windows 98, and Windows Millennium collectively. In this module the student will learn about the Windows file structure and file management system. This module provides information on the registry and the system tools used to manage the information contained in the operating system. Also covered in detail are preparing a hard drive, installing an operating system, and troubleshooting the system.

System Tools

The Registry is a hierarchical database used to manage the information needed by the Windows operating system. Older versions of Windows stored system and user data in INI files, which were usually scattered across multiple directories and could easily be edited by programs or the end user. The Registry takes all of those files and stores them in a considerably more secure location.

The Registry is made up of **SYSTEM.DAT** and **USER.DAT** files. The SYSTEM.DAT file contains information about the hardware in the system. The USER.DAT file contains user specific information. Windows 98 can still use the SYSTEM.INI and WIN.INI files in order to run applications designed for Windows 3.x.

Since the Registry is a hierarchical database, it can be viewed by using the **REGEDIT.EXE** utility. The Registry Editor displays the Registry in a format that is similar to Windows Explorer.

SCANREG.EXE can be used with any Windows 9x operating system to backup or repair the system registry.

MSCONFIG.EXE is an excellent tool for users of Windows 98 and ME. It is not included in Windows 95. MSCONFIG.EXE, as shown in Figure , allows the user to control how the system is started by giving quick access to important Windows configuration/initialization files, including CONFIG.SYS, AUTOEXEC.BAT, SYSTEM.INI, and WIN.INI files. It also allows the user to select what programs are loaded automatically when the computer is booted.

ASD.EXE is used to skip a driver when the operating system fails during bootup. This troubleshooting utility should be used when there is a problem with a driver that cannot be solved by booting into safe mode.

Preparing a Hard Drive for Operating System Installation

Partitioning a hard drive.

When a new hard drive is installed it is completely blank. There are no spaces where files and folders can be stored. To create those spaces, a hard drive must first be divided into logical sections. These sections are called partitions. The partitioning process creates spaces of contiguous sectors on the hard drive. Each partition can receive a file system for an operating system. Without a file system, the partition is useless.

Primary and Extended Partitions

Typically with DOS, when the hard drive is divided into more than one partition, the first partition is referred to as the primary partition, while the second is called the extended partition. DOS and Windows refer to these drives with letters, such as C or D. The primary partition is usually the active partition, that is, the partition DOS refers to during the bootup process.

DOS can have up to four separate primary partitions, or three primary and one extended, two primary and one extended, or just one primary and one extended partition on one hard drive, depending on the user's needs. DOS can have up to four separate partitions on any one hard disk. The extended partition uses the free hard disk space, and is normally assigned all the available space outside the primary partition(s).

Logical Drives

When a hard drive is partitioned, including an extended partition, the extended partition uses up all free hard disk space not included in the primary partition(s). There can be only one extended partition per disk, but unlike the primary, it can be subdivided into multiple (up to 23) sections called logical drives. Having multiple logical drives inside the extended partition provides some advantages:

- Rapid retrieval of information
- Multiple operating systems, such as MS-DOS and Windows 98 can be installed on the same computer provided both drives have the same file system or File Allocation Table (FAT). FAT is detailed in a later in this chapter.
- Logical drives physically separate information for organizational and security reasons.

Formatting a hard drive.

After partitioning the drive, it must be prepared to store data. This process is called formatting. Formatting a hard drive creates magnetic tracks in concentric circles on the disk surface. These tracks are then broken up into chunks of 512 bytes called sectors

Low-level and High-level Formatting

There are two important concepts about formatting a hard drive that need to be understood. These include low-level formatting and high-level formatting.

Low-level formatting routine marks off the disk into sectors and cylinders, and defines their placement on the disk. IDE and SCSI, which are system-level drive types, normally come with the low-level format already performed at the factory. Some SCSI devices may still require a low-level format, but never do a low-level format on an IDE hard drive unless the drive has failed miserably.

High-level format routine is performed by the format command in MS-DOS. This procedure creates logical structures on the disk that tells the system what files are on the disk and where they can be found. When using MS-DOS or a Windows 9x boot system (containing format command) to format the hard drive, the process creates a blank FAT and root directory structure on the disk. Perform a high-level format when preparing the hard drive for the operating system installation

File Allocation Table (FAT)

During formatting, a special file, called the File Allocation Table (FAT) is created and located in the disk sector 0. FAT is a reference table that the operating system uses to locate files on the disk.

A built-in program such as CVT1.EXE, or other third party utilities such as Partition Magic can be used to convert FAT16 to FAT32, without destroying the data in the disk partition. However it is not possible to convert a FAT32 partition back to a FAT16 partition.

Installing Windows 98

To install Windows 98, the following minimum hardware platform is required:

- An 80486DX/66 MHz or faster processor, operating with at least 16 MB of RAM. A recommended minimum of 32 MB of RAM, or ideally, 64 MB of RAM if the system can support it.
- The system must possess a keyboard, a mouse, and a 16-color VGA monitor or better (SVGA recommended).
- The system hard drive needs to have between 255 and 355 MB of free space available to successfully install Windows 98 full version on a FAT16 drive or 175 and 255 MB drive space on a FAT32 drive.
- To upgrade from Windows 95 requires about 195 MB of free hard disk space, but may range from between 120 MB and 255 MB, depending on the options that are installed.
- Sometimes a modem is required to download device driver upgrades from various sources on the Internet. The minimum required is a 14.4 kbps (28.8 kbps or faster is recommended).
- 3.5-inch high-density floppy disk drive and CD-ROM drive (32 speed is recommended).

Installing Windows 9x

The steps of the installation procedure are divided into four phases.

Phase 1	
Phase 2	
Phase 3	
Phase 4	

System Properties

has four categories of information that can be accessed by clicking on the tabs:

General – General information about the system such as version of Windows 98 installed, total RAM, type of CPU, percentage of used system resources (useful but not very accurate), and so on. The type of information may vary, depending on computer manufacturer. Figure shows general information for a system running Windows 98.

Device Manager – Displays the hardware that is installed and the status of these devices as shown in Figure . Devices can be viewed by type or their connection. Device Manager provides the options to view the properties of the devices listed, refresh the list to ensure any changes that have been made can be viewed, remove a device, and to print.

Hardware Profiles – Most PCs have no need for different hardware profiles. However, a laptop used at different locations, such as at home and at work, may need different profiles. The Hardware Profiles option allows various hardware configuration profiles to be created and then selected when the system boots up as shown in Figure .

Performance – Shows the detailed performance status that indicates if the system is configured for optimal performance as shown in Figure . Advanced settings can be edited for the file system, graphics, and virtual memory.

Device Manager

The Device Manager is included with Windows 98, and allows the user to manage, view, and change computer resources. The Device Manager in Windows provides a graphical interface representation of the devices configured in the system. This utility is used to identify installed ports, update device drivers, and change I/O settings on the computer. It can also be used to manually isolate hardware and configuration conflicts. The Device Manager allows examination of any problem device to see where the conflict is occurring. To view the icons in the Device Manager, right-click on My Computer and select Properties.

From the Device Manager menu, it can be determined whether there are any problems with installed devices on the system. Within the device, three types of problems can be located, an exclamation mark, a red X, or an Other Device:

An exclamation Point (!) inside a yellow circle.	
A Red "X" appearing at the device's icon.	
"Other device" appears in place of icon.	

