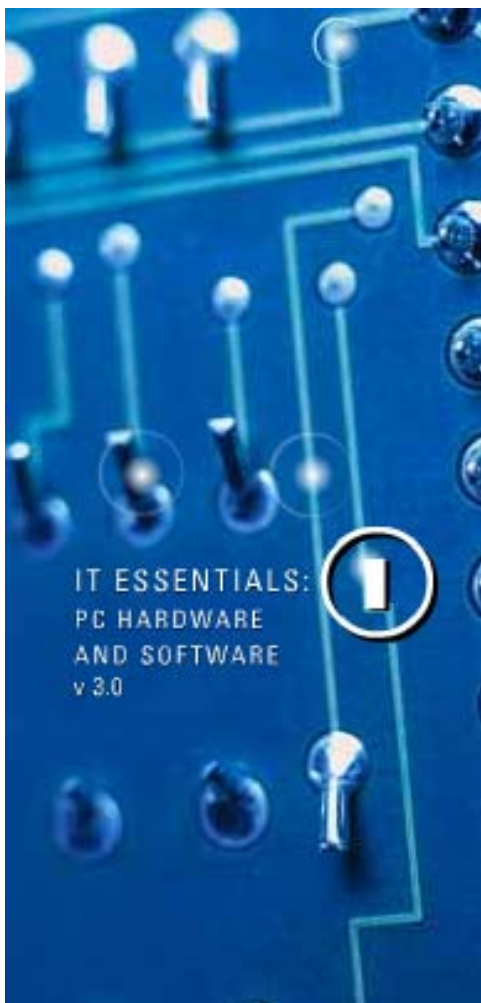


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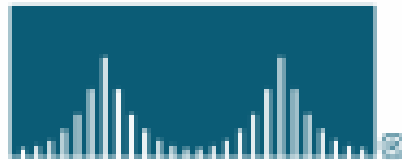
Final Exam

Study Guide

2003-04



CISCO SYSTEMS



EMPOWERING THE
INTERNET GENERATIONSM

CISCO IT Essentials - Final Exam Study Guide

Name: _____

Chapter 1 - Information Technology Basics

The Operating System

The Disk Operating System (DOS), Windows 98, Windows 2000, Windows NT, Linux, Mac OS X, DEC VMS, and IBM OS/400 are all examples of operating systems.

The Windows operating system (3.1, 95, 98, 2000, XP, or NT) is designed for use with an IBM-compatible personal computer often referred to as a PC. The Mac OS, on the other hand, will only work with Macintosh computers. PC and Macintosh are called platforms.

Applications

A database is a collection of data that is organized so that its contents can be easily accessed, managed, and updated. It is an electronic filing system. Microsoft Access, Oracle Database, and FileMaker are all examples of database applications. PC databases fall into two distinct categories, flat-file and relational.

Starting Programs in Windows

The Run feature is another method of starting a program, instead of clicking the program's shortcut icon on the desktop or on the list of programs within the Programs directory. Access the Run feature by clicking on Start and choosing Run.

Switching between programs

When more than one window is open, the user can switch between windows by pressing **Alt +Tab**.

The Application Window

Title Bar – Displays the name of the document and application. Also located in the title bar are the Minimize, Maximize, and Exit buttons.

Moving Icons

To move the created icon or another desktop icon to another position on the desktop, click on it and then drag it to the desired location. If the icon does not move, disable the **Auto Arrange** function on the desktop. To do this, right-click on an empty space of the desktop and uncheck the **Auto Arrange**.

Viewing a computer's basic system information

To view information about the system in Windows 2000, go to the **Start** menu and choose **Programs > Accessories > System Tools > System Information**.

It will also show how to view information such as the type of operating system, the processor type, and the type and amount of Random Access Memory (RAM) that is installed.

Using a Wrist Strap

After putting the wrist strap on, allow 15 seconds to pass before touching any sensitive electronic components with bare hands. This pause allows the wrist strap to neutralize the static electricity that already exists on a person's body.

Electronic Signals

It may be necessary when assembling a computer system to test electrical signals on a motherboard or its components. A Multimeter is used to test high-voltage devices.

Connecting Computer Systems

Computers used by students, teachers, and administrators are all connected (networked). This saves the expense of having to buy peripheral equipment like printers for each computer.

Birth of The Internet

When the Advanced Research Projects Agency Network (**ARPANET**) project began, no one anticipated that the network would grow to the extent that it did. Throughout the 1970s, more nodes or access points were added, both domestically and abroad.

The Domain Name System (DNS) was introduced in 1984, providing a way to map friendly host names to IP addresses. It was much more efficient and convenient than previous methods.

Encryption Algorithm

Another common type of algorithm is an encryption algorithm. These algorithms are used to prevent hackers from viewing data as it passes through the Internet. Encryption standards are used to secure connections between networking devices and hosts.

Workspace cleaning supplies

Although a new system will not need to be cleaned during the assembly process, over time, computer systems can gather dust and other residues. Do not confuse isopropyl alcohol with rubbing alcohol. **Rubbing alcohol** is relatively impure and can actually contaminate electrical connections.

Measurements

A bit is the smallest unit of data in a computer. A bit can take the value of either one or zero, and it is the binary format in which data is processed by computers.

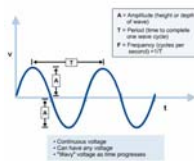
A byte is a unit of measure that is used to describe the size of a data file, the amount of space on a disk or other storage medium, or the amount of data being sent over a network. One byte consists of eight bits of data.

A kilobit (Kb) is 1024 (or approximately 1000) bits.

A kilobyte (KB) is 1024 (or approximately 1000) bytes.

A megabyte (MB) is 1,048,576 bytes (or approximately 1,000,000 bytes).

Hertz is a unit of measurement of frequency. It is the rate of change in the state or cycle in a sound wave, alternating current, or other cyclical waveform. Hertz is synonymous with cycles per second and it is used to describe the speed of a computer microprocessor.

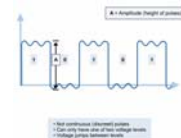


Analogue

The world used to depend entirely on analogue processes, machinery, and communications for its functions. The variables that characterize an analogue system may have an infinite number of values.

Digital

In binary arithmetic, as used on modern computers, only two values are allowed: 0 and 1. Computers and cable modems are examples of digital devices. Digital devices are gradually replacing analogue devices.



Chapter 2 - How Computers Work

SCSI

Most SCSI buses can handle a total of 7 devices and a SCSI controller per channel. Each SCSI device in the chain, including the SCSI controller card, is given a SCSI ID number from 0 to 7; #0 for the primary boot device (hard drive), and #7 for the SCSI controller card.

SCSI-1

originally just known as SCSI. By today's standards it was rather slow. SCSI-1 generally supported a single channel per SCSI controller. The SCSI-1 internal cable was a ribbon cable that was attached to the disk controller by a 50-pin connector.

SCSI-2

Uses the same 50-pin connector on the internal SCSI cable that is used by SCSI-1 devices. SCSI-2 also has a variant called Wide SCSI-2, which can transfer 16 bits at a time as opposed to the 8 bits at a time used by normal SCSI-1 and normal SCSI-2. This extra bus width requires the use of a 68-pin connector. Wide SCSI-2 allows for 16 devices on the SCSI-2 channel, whereas normal SCSI-2 (also called narrow SCSI-2) and SCSI-1 only allow 8 devices on the SCSI channel.

Wide SCSI 2 supports a total of 15 devices and a SCSI controller.

IRQ Channels

IRQ (Interrupt Request) 8 is for the Real Time Clock.
IRQ 7 Parallel Port 1 (LPT1), or Sound Card (Shared).

Input Output Addresses - I/O Addresses

I/O Address 3F8-3FF is for COM 1 Serial Port

DMA Channels - Direct Memory Access

Direct Memory Access (DMA) channels allow devices to bypass the processor and directly access the computer memory. DMA Channel 2 is for Floppy Disk Controller

Monitors

Monitor screen sizes are measured in inches, just like televisions. The most common sizes are 14", 15", 17", 19", and 21" screens, measured diagonally.

Pixels are picture elements. The screen image is made of pixels (tiny dots), which are arranged in rows across the screen. Each pixel consists of three colours: red, green, and blue (RGB).

Processors

The CPU speed is not controlled by the microprocessor itself, but by an external clock located on the motherboard. The speed of the processor is determined by the frequency of the clock signal.

Slot 1 type of processor uses: Pentium II, 233—450mhz. Pentium III, 450mhz and up.

Expansion Slots

PCI Slot is a 32-bit local bus slot developed by Intel. Since they talk to the motherboard at 33 MHz, the PCI bus slots offer a significant improvement over ISA expansion slots. PCI expansion slots are the most commonly used type in motherboards today.

Developed by Intel, AGP is a dedicated high-speed bus that is used to support the high demands of graphical software. This slot is reserved for video adapters. This is the standard graphics port in all new systems. This slot is usually coloured brown.

Storage Devices

Storage devices: Hard drive, floppy, CDROM etc.

Restarting the PC

Restarting a PC that has already been powered up is referred to as a **warm boot**. This can be achieved by pressing the reset button on the front panel. Alternatively, press **Ctrl + Alt + Delete**, and click **Restart** from the menu that displays.

Modems

A modem plugged to one of the expansion slots inside a PC is known as an internal modem. Such a modem usually has two types of connectors called registered jack type 11, more commonly called RJ-11 jacks. One is for the phone line while the other is used to attach a traditional telephone handset.

Memory

Random access memory (RAM) is the place in a computer where the OS, application programs, and data in current use are kept so that they can be quickly reached by the processor.

The cache (pronounced CASH) is a place to store something temporarily. The type of RAM that is used for cache memory is called SRAM. SRAM is relatively more expensive, but it is fast and holds data when the power is turned off for a brief period of time. This is useful in such circumstances as an unexpected loss of power. SRAM stands for Static RAM.

Identifying SIMMs and DIMMs

A SIMM plugs into the motherboard with a 72-pin or 30-pin connector.

A DIMM plugs into the system memory bank using a 168-pin connector.

PCMCIA Cards

The Personal Computer Memory Card International Association (PCMCIA) card, introduced in 1989, is a special expansion card type designed primarily to accommodate the needs of the portable computer market. Three types of PCMCIA card, type I, II and III.

Type III cards are 10.5mm thick and designed to be used solely for hard drives.

Interfaces

The Universal Serial Bus (USB) is an external port, that allows the user to connect up to 127 external PC peripherals, including USB keyboards, mice, printers, modems, scanners, and external disk drives. USB is considered hot swappable, this means you can attach and remove devices while the system is running.

Serial ports can be used to connect devices that use a serial interface such as a modem, scanner, mouse, etc. The **DB-9** (9-pin) connector is used on most new computers for the serial ports.

POST Checks

To test the computer hardware, the bootstrap program runs a program called power-on self-test or POST. In this test, the computer central processing unit (CPU) checks itself first and then checks the computer system timer. The POST then checks the RAM.

Chapter 3 - Assembling a Computer

When should a wrist strap not be used for grounding?

A wrist strap is never worn when working on a monitor or when working on a computer power supply.

Attaching Power

An AT motherboard requires two power connection to the power supply. ATX requires one. When connecting an AT power supply to a motherboard Plug the P8 and P9 wire lead connectors in the 12-pin power connector.

Caution: Make sure the black wires are in the middle.

On an ATX system, there is one large 20-pin (P1) connector. It is keyed for easy installation.

Whether buying a tower or desktop (to be discussed in the following sections), it is recommended that it conforms to the ATX standard and has at least a 250-watt power supply (300 watts is ideal).

Yellow wire is +12 V

Form factor

newest form factor, and the one most often encountered, is the ATX. Older less used is AT.

Memory

There are two types of memory modules used on most PCs. These are 168-pin dual inline memory module (DIMM) cards and 72-pin single inline memory module (SIMM) cards.

The slots in which RAM is inserted are called Banks.

It is important to remember to put the **DIMM** with the largest memory size in the first bank.

The SIMM module is inserted at an angle of about 45 degrees.

RIMM modules use only the direct Rambus memory chips (RDRAM)

Attaching the LEDs

Because LEDs involve very small connectors, sometimes one or two connections could be wrong. If the wrong connector is used, the LED will not light up when the computer is powered up.

Floppy Drive Cable

The floppy drive exchanges data with the motherboard devices, including the microprocessor, via a 34-pin flat ribbon (data) cable.

A red stripe on the edge of the cable identifies pin 1.

Incorrectly oriented cable becomes immediately apparent on power up by the fact that the floppy drive LED light comes on immediately and stays on.

The twist consists of 7 data wires. This feature, called cable select, automatically configures the drive on the middle connector as Drive B and the drive on the end connector as Drive A.

Hard Drive/CDROM Drive IDE

An IDE cable typically has 40 pins and can also have two devices attached to it.

One device must be set as the master and the other as a slave using jumpers.

You should never move a computer when the power is turned on as it will damage the hard-drive

The BIOS

The BIOS places a prompt on the display to tell the user that the CMOS Setup utility can be accessed by pressing a special key, or a given key combination. Typical keys and key combinations include the Esc key, the Del key, the, the F2 function key, and the Ctrl+Alt+Esc key combination.

Inside the BIOS it is usually recommended to set the drive type to Auto. This allows the BIOS to auto-detect and configure the hard drives so that this information does not have to be entered manually.

BIOS Password screens

User Password – This option allows the installation of a password that will keep the system from booting unless the proper password is entered. This option also prevents access to the BIOS, eliminating the possibility of other people changing the BIOS setup on the computer.

Supervisor Password – This feature is normally found only in large institutions, BIOS setups are locked with a master password only known to the network administrator or an administrator designee.

If a password has been set, and the user has/supervisor has forgotten the password, the only way to clear this password, is to use the clear CMOS jumper setting on the motherboard

Startup sequence

During the computers POST check error code 3xx means a keyboard problem.

Bootup Sequence.

One important setup option on the BIOS Features Setup screen allows the system boot order to be specified. For example, on newer systems it is preferable to boot from the hard drive or CD-ROM rather than from the 3.5" floppy drive as older systems did. If a letter A is first then the computer will boot to the floppy drive first.

Processors

AMD Athlon Processors use the Socket A.

Chapter 4 - Operating System Fundamentals

Operating Systems

Kernel - This is the core of the operating system. the kernel is responsible for loading and running programs or processes and managing input and output.

File Management System - The management system is what the operating system uses to organize and manage files.

Multitasking - Capability of a computer to run multiple applications at the same time.

UNIX - UNIX has been around since the 1960's and is one of the oldest operating systems. UNIX has always been popular with computer professionals.

DOS Commands

Format

format A: /s is responsible for copying system files after formatting the disk.

Format /q - does not clear the FAT, making file recovery possible.

Deltree

This command erases a directory including all files and subdirectories that are in it.

Copy

copy /v verifies a file has been copied correctly.

copy C:\test.txt A: - copies a file from hard drive to floppy drive.

CHKDSK

This command displays the status of a disk.

Type

command only displays the contents of a text file.

MD

Makes a new directory

DOS Files

IO.SYS - required for DOS to boot

MSDOS.SYS - required for DOS to boot

CONFIG.SYS

COMMAND.COM - required for DOS to boot

AUTOEXEC.BAT

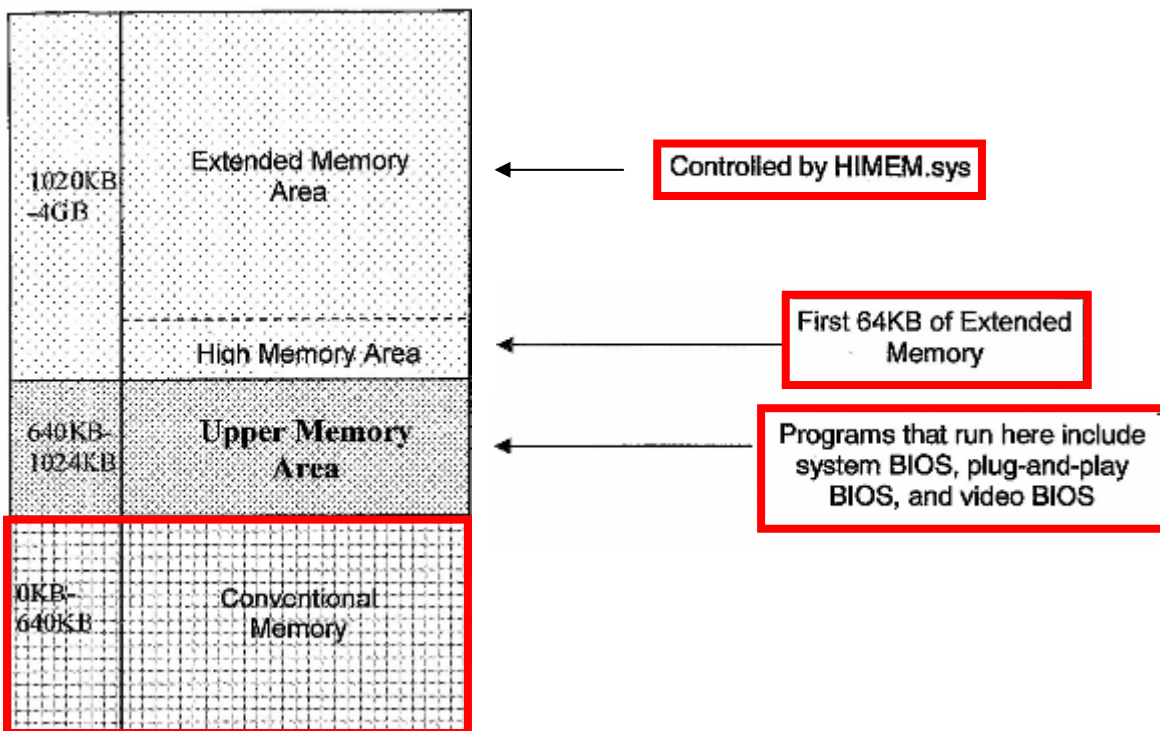
MSDOS.SYS - Loads file management functions

CONFIG.SYS - In Windows 9x, CONFIG.SYS is mostly needed for the installation of real-mode device drivers for those devices that may not be supported by Windows 9x (32-bit) device drivers.

It is also used to run memory managers. DEVICEHIGH=C:\DOS\MOUSE.SYS will load the mouse driver into upper memory blocks.

COMMAND.COM - This file is required for DOS to boot. Command.com is responsible for executing autoexec.bat.

Memory



0 - 1024KB of memory - Real mode can address.

The Windows 2000 swap file (page file) is named **PAGEFILE.SYS**.

General Protection Fault Error

Occurs when one application tries to access the same memory location used by another application.

Chapter 5 - Windows 9x Operating System

The Registry is a hierarchical database used to manage the information needed by the Windows operating system.

The Registry is made up of **SYSTEM.DAT** and **USER.DAT** files.

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

MSCONFIG.EXE

Allows the user to control how the system is started by giving quick access to important Windows configuration/initialization files.

ASD.EXE

is used to skip a driver when the operating system fails during bootup.

Logical Drives

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.

Formatting a hard drive

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 formatting routine marks off the disk into sectors and cylinders, and defines their placement on the disk.

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.

System Properties

General – General information about the system such as version of Windows 98 installed, total RAM, type of CPU.

Device Manager – Displays the hardware that is installed and the status of these

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.

An exclamation Point (!) inside a yellow circle - The device has a resource conflict.

A Red "X" appearing at the device's icon - The device has been disabled, removed, or Windows is unable to locate the device.

"?" appears in place of icon - The drivers are not loaded for this device.

Windows 9x Installation Steps:

Phase1 - Preparing to Run Windows 98 Setup

Creating a **SETUPLOG.TXT** file in the drive root directory.

Phase2 - Collecting Computer Information

Phase3 - Copying Windows 98 Files and Restarting the Computer

Phase4 - Setting Up Hardware and Finalizing Settings

Chapter 6 - Windows 2000

File Systems

FAT16 is only capable of dealing with partitions up to 2 GB.

Both FAT16 and FAT32 file systems maintain two copies of the FAT, which are the default and backup copy.

Cluster Size

Cluster size is the minimum amount of disk space a file must take up on a hard disk. The smallest cluster size using the NTFS file system is 512 bytes.

NTFS5 also includes a feature called **disk quotas**, which provide the system administrator with the ability to assign limits to the amount of hard disk space that users are allowed to occupy on the server

Permissions

File and directory permissions specify which users and groups have access to certain files and folders.

Permissions can be assigned at folder level or at individual file level:

If a folder has **write permissions** for a user then that user can create new files and subfolders within the folder, change folder attributes, and view folder ownership and permissions.

If a file has **full control permissions** then a user can change permissions and take ownership, plus perform the actions permitted by all other NTFS file permissions.

Encryption

administrators to encrypt a file or folder so that only the person who encrypted the file can view it. Other users can be granted access if they are assigned a public key. This allows a user to work with the file. Anyone without the public key cannot access the file.

Preboot sequence

Power on Self test POST. loads and initializes the NTLDR file, which is the operating system loader, and begins to load the operating system.

The Boot sequence

NTLDR
BOOT.INI
NTDETECT.COM
NTOSKRNL.EXE
HAL.DLL

NTLDR reads the BOOT.INI file to enable the on-screen display of the boot menu. The user can select which operating system to load if the computer is set to dual boot.

NTLDR runs NTDETECT.COM, which gathers information about the computer hardware.

Disk Management

You use the '**Disk Management Tool**' to control and manipulate the computers hard drives.

The main difference between basic and dynamic disks is that dynamic disk volumes can be worked on while an operating system is running. This makes dynamic disk management easier than creating partitions.

Simple Volume – This volume acts as a basic disk that contains disk space from a complete single disk. It is not fault-tolerant.

Spanned Volume – This volume includes disk space from multiple disks. There can be up to 32 disks in a spanned volume. In a spanned volume the operating systems write data to the first disk until it runs out of space. Then it continues to write data to the proceeding disks for as many disks as are included in the volume. If one disk in a spanned volume fails, the data in the entire volume is lost — Not fault tolerant.

Mirrored Volume – This volume contains two identical copies of a simple volume that stores the same data on two separate hard drives. Mirrored volumes provide fault tolerance in the event of **hard disk failure. If one disk fails, a new one can replace it. All of the data is backed up on the other disk.**

Registry

HKEY_USERS – This subtree contains the system default settings used to control individual user profiles and environments, such as the desktop settings, the windows environment, and the custom software settings.

HKEY_CLASSES_ROOT – This subtree contains the configuration data of all the software that is installed on the computer.

Emergency Repair Disk

To make an ERD Go to **Start > Programs > Accessories > System Tools > Backup** to run the Backup program and click the Emergency Repair Disk button on the Welcome tab.

Hardware Abstraction Layer - HAL

The main advantage that Windows 2000 has, when compared with Windows 9x, is the Hardware Abstraction Layer (HAL). The HAL is a library of hardware drivers that function between the operating system and system. The HAL enables Windows 2000 to work with different types of processors from different manufacturers. This feature prevents Windows 2000 from interacting with the hardware as it does in Windows 9x. The HAL controls all direct access for hardware operations, thereby expanding the hardware compatibility of the system.

Hardware Compatibility List - HCL

Hardware Compatibility List (HCL) is a tool that can be used before installation to verify that hardware will actually work with Windows 2000. Microsoft provides drivers for only those devices that are included on this list. The use of hardware that is not listed on the HCL might cause problems during and after installation.

Completing the Setup program

This step of the installation removes temporary files.

To upgrade from Windows 9x

Run the WINNT32.EXE command on Windows 2000 CDROM.

Chapter 7 - Windows XP

Windows XP Home Edition

XP Home Edition is intended for inexperienced users who do not need to connect to corporate networks. Anyone who logs on to a Home Edition machine will have full control of the operating system.

The XP Professional Features:

Remote Desktop feature
Internet Information Services (IIS) Web server software
Roaming profiles
supports dual processors

Windows XP 64 bit Edition

This operating system is designed to accommodate specialized, technical applications. For example, digital content creators including digital artists, 3D animators, gaming developers, and engineers can view more complex models and simulations to improve their product.

64 bit edition requires 1 GB of Memory.

Windows XP Media Center Edition

The media center provides users with the ability to watch live television, record TV programs.

User State Migration Tool - USMT

The USMT is used by IT administrators who are performing large deployments of Windows XP Professional in a corporate environment.

XP Professional Requirements

At least 64 MB of RAM, with 128 MB recommended.

VGA resolution of 800 x 600 or higher.

make sure the version of Windows is eligible for an upgrade.

Use the Compatibility tool or download the Upgrade Advisor to ensure that the system, devices, and software will work with XP.

Review the documentation before starting any new installation.

Dual boot installation

Can be used when the user desires to preserve the currently installed version of Windows. The new version of Windows needs to be installed on a new partition separate from the current version.

XP Installation 1st step - File Copy

This step copies the Windows Setup files to a folder on the partition where they can run when the system is re-started. If the system is booted from a CD, the Setup skips this step and copies files directly from the CD.

Partitioning

Partitioning is not always necessary if a suitable partition already exists, but if a partition needs to be created then it is done during the install. The recommended file system for Windows XP Professional is NTFS (NT File System). Remember FAT32 may also be used.

Upgrading to XP

Windows 3.1 and Windows 95 cannot upgrade.

Insert the Windows XP CD-ROM in the CD-ROM drive to start the upgrade procedure:

- Go to Start > Run.
- In the Run box, type **D:\i386\winnt32**, where D is the drive letter for the CD-ROM

Dual Boot Systems

if the hard drive is formatted with NTFS, the Windows 98 operating system will not be able to read files in the Windows 2000 NTFS partition. Microsoft recommends that both partitions be formatted with the FAT file system if the computer is set up to dual boot with Windows 98 and 2000. Windows 2000 can operate with the FAT file system, and files in the other partition can be read.

Activation

Once installed Windows XP must be activated within 30 days of installation. Either over the internet or using the automated telephone service.

File Sharing and Permissions

In Windows XP, permissions are set for local users and network users at the folder level only.

XP Internet Cookies

Windows XP can block or allow cookies from each website on the Internet.

Remote Desktop

Remote Desktop uses a Terminal Services technology that allows the user to work on a Windows XP Professional computer from any other computer.

Remote Assistant

To enable Remote Assistant, two parties must establish a session. These parties are known as the novice and the expert. Both parties must be using Windows XP for this connection to work.

Automatic Update Tab

Automatic Update allows the user to configure when and how Windows Update checks for critical updates.

System Restore

System Restore is a Windows XP service that runs in the background. This service allows the user to restore the OS to a predefined point in time. Windows XP creates an initial restore point whenever an install or upgrade takes place.

XP GUI

XP removes the clutter from the taskbar by grouping like applications together. For example, multiple copies of Internet Explorer are grouped and accessed by clicking on the drop-down box.

Fast User Switching

If the user joins a domain with a computer that uses Windows XP Professional, the user will not be able to use Fast User Switching.

Chapter 8 - Multimedia

Multimedia is a combination of: Text, Sound, Graphics and Video.

CD Re-writable

CD-RW drives are rated by the speed at which they write, rewrite, and read information. A CD-RW drive listed as 24x/12x/40x has a write speed of 24x, a rewrite speed of 12x, and a read speed of 40x.

A CDRW can be written to many times.

DVD+RW

DVD+RW is the latest DVD recording technology and many major corporations including Hewlett-Packard back it. As with DVD-RW, the technology is both compatible with existing hardware and is easily written to multiple times. The major advantage of DVD+RW is the ability to use a variable bit-rate when encoding certain types of media, such as streaming video.

Displays

Dots, or basic elements of a video image, comprise what is displayed on a monitor. These dots are also known as **pixels**. The three primary colours that are used for a c computer display are **red, green and blue**.

The size of the screen

On desktop computers, the display screen width relative to height, known as the aspect ratio, is generally standardized at 4 to 3 (4:3). Screen sizes are measured diagonally from one corner to the opposite corner.

Colour capability

Bit-Depth	Number of Colours
1	2 (monochrome)
8	256 (VGA)
24	16,777,216

Sharpness and viewability

The absolute physical limitation on the potential image sharpness of a screen image is the dot pitch. The shape of this beam can be round or a vertical, slot-shaped rectangle depending on the display technology. Displays typically come with a dot pitch of .28 millimetres (mm) or smaller.

The actual sharpness of any particular display image is measured in dots-per-inch (dpi). The dpi is determined by a combination of the screen resolution, which is how many pixels are projected on the screen horizontally and vertically, and the physical screen size.

Video Cards

Newer Pentium systems include an advanced Accelerated Graphics Port (AGP) interface specifically designed for video cards.

When upgrading a video card in a PC system replace the drivers with basic windows drivers before removing the old card and adding the new video card.

Device manager can be used to remove or disable an old video adapter driver.

The video BIOS is responsible for determining how an image is to be displayed. The video BIOS provides the set of video functions that can be used by the software programs to access the video hardware.

Sound Cards

Most sound cards use IRQ 5.

MIDI—Musical Instrument Digital Interface - common audio file type.

MPEG Video

MPEG 1 video specification supports CD-quality sound.

MPEG 2 video specification supports CD-quality surround sound (DVD).

Video Capture

A Video Capture Card is used to convert a TV output into a digital format.

SVideo is the type of output signal that is generated from a VCR or camcorder when connecting to a video capture card.

USB

USB allows for the hot swappable connection of many external peripherals.

Digital Cameras

Light is recorded electronically by a semiconductor device. Some very high resolution digital cameras can provide as good if not better results than film cameras.

The most common file formats are TIFF and JPEG.

CCD is image sensor technology which is used by most high-end digital cameras.

Types of removable media used with digital cameras:

Memory Stick
PCMCIA hard disk cards
writeable CD

Digital video camera formats

MiniDV
Digital8
DVD

Digital video cameras have a higher resolution than analogue video cameras.

CCD Technology

Most High end digital cameras use CCD technology.

Chapter 9 - Server and Hardware Fundamentals

KVM Switch

A network server is a computer system in a network that is shared by multiple users. Also, one keyboard, monitor, and mouse may connect to any number of servers through a keyboard video mouse (KVM) switch. KVM switch is a device used to connect one keyboard, one mouse, and one monitor to two or more computers.

RAID 0

RAID 1

RAID 5

RAID 0/1

Raid 0

RAID 0 is known as disk striping. Specifically, it is a stripe set without parity. RAID 0 is not fault tolerant. RAID 0 should not be used in a production-server environment. However, RAID 0 is often used in a high-powered workstation to improve disk input/output performance.

RAID1

Mirroring - In disk mirroring, everything written to one disk is also written to a second disk. Reading can be performed from either disk. Since data is duplicated on two different disk

Duplexing - Disk duplexing eliminates the single point of failure that exists in disk mirroring. This is done by adding another disk controller and configuring the RAID system to duplicate data on disk drives that are attached to two different disk controllers. The user is just adding further redundancy in the form of a second controller.

RAID5

RAID 5 uses a much more complicated scheme to provide fault tolerance in the case of a single disk failure. The failure of a single disk drive does not cause the network server to fail. The missing information that was on the failed disk can be recreated quickly using the parity information on the remaining disks. RAID 5 cannot survive the failure of a second disk drive after one disk drive has failed.

RAID0/1

This yields the fault tolerance of RAID 1 and the input/output speed of RAID 0. RAID 0/1 requires a minimum of four disk drives to implement.

RAID Controllers

RAID controllers are specialized disk controllers that use either advanced technology attachment (ATA) or small computer system interface (SCSI) technologies. SCSI RAID controllers have multiple channels. Two channels are common. RAID controllers with three, four, and five channels are available. RAID controllers often have an on-board memory cache ranging in size from 4 MB to 256 MB. This onboard memory cache often has a battery backup system to prevent data loss in the event of sudden power loss to the network server.

The write cache will allow the processor to continue with other tasks instead of waiting for the data to be written to the disk.

Hardware Versus Software RAID

When using the Windows 2000 version of RAID, the hard drive must be converted to a dynamic disk before the RAID options are available to implement.

Software RAID is usually implemented at the disk partition level rather than the physical disk as in hardware RAID.

Hardware RAID

Network servers that contain a RAID controller must have the RAID system configured before the network operating system can be installed.

The formula to work out the amount of storage on a RAID 5 array is $(n - 1) * c$, where n is the number of disk drives and c is the capacity of each of the disk drives.

External Peripherals

External disk subsystems are necessary when the amount of disk storage cannot be accommodated by the disk drive bays internal to the network server chassis. These external disk subsystems can be either SCSI or Fibre Channel.

CDROM Servers

A LUN enables a user to assign sub-SCSI IDs to a single SCSI ID. This means that the user could have 7 CD-ROM drives all with the SCSI ID of 5.

Upgrading Network Servers With Additional Processors

Windows NT Server 4.0 - If the original installation of Microsoft Windows NT Server 4 was on a network server with a single processor, the hardware abstraction layer (HAL) on the network server must be updated for the network server to recognize and use multiple processors. To upgrade Windows NT 4 to a multiprocessor HAL, use the UPTOMP.EXE utility available on the Microsoft Windows NT 4 Server Resource Kit.

Novell NetWare 5 - To upgrade Novell NetWare 5 so that it will recognize the additional processor, follow these steps:

Step 1 Load NWCONFIG

Adding Hard Drives

ATA Drives

The ATA channels are usually labelled primary and secondary so that the system can distinguish between them. Putting the second ATA disk drive onto the secondary channel results in having one ATA disk drive on each ATA channel. Then performance of the disk subsystem can be enhanced.

SCSI Drives

Remember that the SCSI bus must be terminated at both ends.

Remember to be able to boot an operating system from a SCSI drive, the SCSI drive must have a SCSI ID of 0.

A SCSI system has a memory buffer which takes care of all the read write operations. This means the computers processor is free to perform other tasks.

Installing Additional Memory—RIMM's

If an actual RIMM memory module is not installed in a slot, a continuity module must be installed. Adding a RIMM memory module involves removing a continuity module and replacing it with a RIMM memory module. Failure to have continuity modules in the memory slots not occupied by RIMMs may result in a network server that does not power up.

Upgrading SCSI Adapter

- Step 1. Locate the latest BIOS or firmware on the adapter vendor's website.
- Step 2. Download the BIOS or firmware upgrade and follow the vendor's instructions to install the upgrade.

Replacing a PCI Adapter

a recent technology known as peripheral component interconnect (PCI) hot plug or PCI hot swap enables the user to replace, upgrade, or add an adapter without powering down the network server.

Peripheral Devices

A peripheral device is any device that is not part of the core computer system, which includes the processor, memory, and the data bus. Peripheral devices can be either internal to the server chassis or external to the network server chassis.

External peripherals are devices external to the network server chassis, such as printers, modems, monitors, keyboards, and mice.

Chapter 10 - Networking Fundamentals

The need or desire to share information was an important part of the desire to develop and use computer networks.

Ethernet

Standard transfer rates are 10 Mbps or 100 Mbps, but new standards provide for Gigabit Ethernet, which is capable of attaining speeds up to 1 Gbps over fiber-optic cable or other high-speed media. Most common type of network.

Token Ring

IBM originally developed Token Ring as reliable network architecture based on the token-passing access control method.

Fibre Distributed Data Interface (FDDI)

FDDI is a type of Token Ring network. Its implementation and topology differ from the IBM Token Ring LAN architecture

FDDI combines high-speed performance with the advantages of the token-passing ring topology.

Network Software

Software licensing agreements may require the purchase of additional licenses for each workstation that uses a network application. This is necessary even though only one copy is actually installed and all users are accessing that same copy.

Transmission

Simplex Transmission — is a single one-way base band transmission. Simplex transmission, as the name implies, is simple.

Half-duplex transmission — is an improvement over simplex because the traffic can travel in both directions. Unfortunately, the road is not wide enough to accommodate bidirectional signals simultaneously. This means that only one side can transmit at a time.

Full-duplex transmission — operates like a two-way, two-lane street. Traffic can travel in both directions at the same time.

Client/server networks

In a client/server network arrangement, network services are located in a dedicated computer whose only function is to respond to the requests of clients.

Servers are designed to handle requests from many clients simultaneously.

Network topologies

The network topology defines the way in which computers, printers, and other devices are connected. A network topology describes the layout of the wire and devices as well as the paths used by data transmissions.

Circuit-Switched versus Packet-Switched Networks

The public telephone system, sometimes referred to as plain old telephone service (POTS), is a circuit-switched communications network.

Modems that are part of a WAN connection would use circuit switching.

Setting the IP Address

An IP address is a 32-bit binary number.

Subnet Mask

A secondary dotted decimal number, known as the subnet mask, always accompanies an IP address. The dotted decimal number 255.255.0.0 is a subnet mask.

DHCP Servers

The most common and efficient way for computers on a large network to obtain an IP address is through a Dynamic Host Configuration Protocol (DHCP) server.

An operating system feature called Automatic Private IP Addressing (APIPA) enables a computer to assign itself an address if it is unable to contact a DHCP server.

DNS (Domain Name System)

Most hosts are identified on the Internet by friendly computer names known as domain names. The DNS is used to translate computer names such as cisco.com to their corresponding unique IP address.

Networking Media

Twisted-pair is a type of cabling that is used for telephone communications and most modern Ethernet networks. UTP - Unshielded twisted pair.

Network Segments

Bridges connect network segments.

What is a protocol?

A protocol is a controlled sequence of messages that are exchanged between two or more systems to accomplish a given task.

Transmission Control Protocol/Internet Protocol - The TCP/IP suite of protocols has become the dominant standard for internetworking. TCP/IP represents a set of public standards that specify how packets of information are exchanged between computers over one or more networks.

Internet Protocol (IP) – IP provides source and destination addressing. In conjunction with routing protocols, IP provides packet forwarding from one network to another toward a destination.

Address Resolution Protocol (ARP) – ARP is used to discover the local address, the MAC address, of a station on the network when its IP address is known. End stations as well as routers use ARP to discover local addresses.

TCP/IP Utilities

tracert - Tracing the route a packet takes on its journey from source computer to destination host is often useful. TCP/IP stacks include a route tracing utility that enables users to identify the routers through which the message passes.

Telnet - Telnet is used to access remote devices for configuration, control, and troubleshooting.

Connecting to the Internet.

Modems - The modem is an electronic device that is used for computer communications through telephone lines. It allows data transfer between one computer and another.

Digital subscriber line (DSL) - An external cable modem is a small box with a coaxial CATV cable connection. Usually, a splitter is used to divide the signal between the TV and the cable modem. The box is connected to an Ethernet card in the computer through UTP Ethernet. External USB devices may also be available to connect the modem to the computer USB port without requiring an Ethernet card.

Satellite Internet

Two modems for uplink and downlink .

Satellites require a clear view to the south since orbiting satellites are over the equator. Just like satellite TV, heavy rains and high winds affect the Internet signals.

Chapter 11 - Printers and Printing

Dot Matrix Printers

The dot matrix printer belongs to a printer class called impact printers. In this type, the printhead actually impacts a printer tape or inked ribbon to cause characters to be formed on paper.

Inkjet Printers

Colour inkjet printers are the most common type of printer in home use today. This is because of their low cost and moderate quality of print.

When the inkjet print operation is complete and the paper leaves the printer, the ink is often still wet. Touching it immediately can smear the ink and smudge the printout. Most inks dry in 10 to 15 seconds.

Laser Printers

Today, the laser printer is the printer most commonly used because of its high resolution, superior operation, and speed.

The photosensitive drum should never be exposed to light for long periods of time.

Cleaning – When an image has been deposited on the paper and the drum has separated from the paper, any remaining toner must be removed from the drum.

Transferring – In this step, the toner attached to the latent image is transferred to the paper.

Fusing - As the paper rolls, the top fuser roller is heated to about 350 degrees, which melts the loose toner powder fusing with the fibres in the paper.

When working around the fuser, remember, that it is hot enough to burn the skin. Always allow it to cool before removing it or servicing it.

Connecting a Printer

Serial - The maximum length of serial cable is 50 feet (18 meters).

Parallel - IEEE 1284 is the current standard for parallel printer cables. Parallel printer cables have two unique ends. The Type-A connector connects to the PC or daisy-chained peripheral and has two screws that should be hand-tightened. The Centronics connector connects to the printer and should be secured in place with the port clips.

USB - Universal Serial Bus (USB) is a very common communication type for not only printers but also other devices due to its speed and ease of setup.

Network - Network printers are commonly used in the workplace because they act as shared resources for all users on the network. The maximum length of a Category 5 cable to connect a printer to the network is 328 feet (100 meters).

Installing a Printer

Adding a local printer is a relatively easy process. In Windows 2000, go to the Start > Settings > Printers. Figure shows the Printer window. Double-click on the Add Printer button. The Add Printer Wizard will launch.

Sharing a Locally Installed Printer

For print sharing to work, special software must be installed and configured on the print server. In Windows, this option is called File and Print Sharing.

The following conditions are best to store paper in:
Dry and Cool

Chapter 12 - Preventative Maintenance and Upgrading

Preventive Maintenance and the Technician

The main goal of any preventive maintenance program is to protect a system from future problems. It is to pre-empt a problem before it happens.

Canned of compressed air is one of the most useful tools for cleaning computer components. A can of air will remove dust from the inside of a computer without creating static.

Loop-back plugs provide important diagnostic information for troubleshooting serial and parallel ports. Loop-back testing works by sending out signals and verifying that the correct input is received.

Environmental Guidelines

Computer printed circuit boards consist of plastics, precious metals, fiberglass, arsenic, silicon, gallium, and lead.

Cathode Ray Tube (CRT) monitors contain glass, metal, plastics, lead, barium, and rare earth metals. **Batteries** from portable systems can contain lead, cadmium, lithium, alkaline manganese, and mercury. **Batteries, CRTs or monitors**, chemical solvents or cans, and **toner kits or printer cartridges** all have special disposal procedures that comply with environmental guidelines.

To determine if a material is hazardous the technician should consult the Material Safety Data Sheet(MSDS).

Temperature - The server room should not exceed 35 degrees C (95 degrees F). If it does, there will probably be a serious problem

Humidity - Moisture resulting from too much humidity in the air can damage the server electronic components. If the environment is too dry, electrostatic discharge (ESD) may occur.

Preventive Maintenance and Electrostatic Discharge (ESD)

At least 3000 volts must be built up before a person can feel an ESD. If the discharge causes pain or makes a noise, then the charge was probably above 10,000 volts.

Antistatic bags - Do not remove any component from special packaging until it is ready to be installed.

Typical examples of components that come in antistatic bags are:

- Motherboard
- Processor
- RAM
- Sound Card
- Video Card

Grounding wrist straps

A grounding wrist strap provides a place for the static to go before it attacks a sensitive computer component. A wrist strap should not be worn when working with high-voltage equipment, such as a power supply or a CRT monitor. These components should only be serviced by a certified professional.

Cleaning and maintaining other computer components and peripherals

Monitor - Use a damp cloth with a mild detergent to wipe down the entire display unit and remove any dust build up. If liquid drips inside a CRT display while it is being cleaned, it is best to let it evaporate. Never open a CRT display.

Printers - Printers have many moving parts within them. Therefore, they require a higher level of maintenance. Printers produce impurities that collect on the components within the device. Over time, these impurities need to be cleaned out. Otherwise, they may cause the printer to malfunction.

Software Utilities

Defrag – When a program is installed on a computer, it may be stored in more than one place on the hard drive. This is known as fragmentation. Fragmentation lowers the performance of a drive. This utility optimizes space on the hard drive to allow programs to execute faster.

User Responsibilities

Managing Applications - When installing applications, use the Add/Remove Programs utility. Certain applications may not use an install shield, and if the setup program crashes in the middle of the install, it could cause the system to fail. The Add/Remove Programs utility can also be used to completely remove an application from the system.

Firewall

A firewall is a hardware or software system that is used to prevent unauthorized people from accessing sensitive data.

Closes the broadband connection after detecting any attempts to hack into a digital appliance
After installing a firewall, certain ports will need to be opened to use e-mail and the Internet. SMTP uses port **25** and POP3 uses port **110** to transmit and receive e-mail. Port **80** will also need to be opened for HTTP, the standard protocol that supports the exchange of information on the World Wide Web.

Windows XP has a built in firewall called Internet Connection Firewall (ICF),

The firewall (ICF) monitors all the outbound and inbound communications of a computer.

Power Issues

Blackouts – Complete loss of power for any amount of time, as shown in Figure . They are usually caused by weather-related events such as high winds, lightning, or earthquakes.

Spikes – Sudden increases in voltage that are much higher than normal levels. For example, if the event lasts one or two seconds, it is called a spike. These are usually caused by lightning strikes but can also occur when the utility system comes back online after a blackout.

Power Surge – A dramatic increase in voltage above the normal flow of electrical current. Power surges are also referred to as transient voltage. Surge suppressors can help protect delicate computer components from power surges.

Surge suppressors

Surge suppressors, which are also called protectors, can help guard against electrical surges and spikes by diverting extra voltage to the ground.

Standby Power Supplies (SPSs)

A standby power supply (SPS) has a backup battery to supply power when the incoming voltage drops below the normal level. The battery is on standby during the normal operation of the unit.

Uninterruptible Power Supplies (UPSs)

An uninterruptible power supply (UPS) is comparable to SPS. However, a UPS requires battery power to operate.

Chapter 13 - Troubleshooting PC Hardware

Identify the Problem

This includes defining the general symptoms so the possible causes can be determined.

Gathering Information

Fast and efficient troubleshooting involves gathering the correct information to develop an accurate solution.

Developing a solution

Creating a solution is the third step in the troubleshooting process.

Implementing the solution

Always backup critical data before making any changes that have the potential to corrupt data stored on the computer.

Always start with the simple things first.

Is the problem solved?

After the solution has been implemented, the technician can run diagnostic tests, visually inspect, and listen to the system to verify that the problem is solved.

If the system is not operating correctly, the technician will be required to undo any changes made to the system and return to the beginning of the troubleshooting cycle.

Documenting the solution

It is important to document all the changes that were introduced to the system as a result of solving the problem. This record can be the starting point for troubleshooting future problems. The documentation can also eliminate an entire set of suspect problems.

Troubleshooting the Hardware Box

Devices that can be replaced or added in the field are called field replacement units (FRU).

- * Monitors
- * Keyboard/mouse
- * Modular expansion cards
- * Power supply
- * RAM such as DIMMs, SIMMs, and RIMMs
- * Floppy and fixed disk drives
- * Motherboard

POST Errors

Every time the computer is turned on, it runs through a power-on self test (POST).

As the computer is turned on, the POST function is passed to the first bank of RAM. During the POST, the computer checks for a properly functioning system timer, CPU, video card, memory, and keyboard.

If a keyboard is not properly connected, the user might get a beep code or a 301 error message.

BIOS/CMOS

Common errors associated with the BIOS include Complementary Metal Oxide Semiconductor (CMOS) checksum error (a compatibility problem between the ROM chip and the motherboard),

Identifying the Faulty or Incorrect CMOS Setting

One way to help resolve CMOS related errors is to reset the CMOS settings to default. Resetting the CMOS clears the memory and all potentially corrupted data. The easiest way is to remove the CMOS battery.

Upgrading the BIOS

A BIOS upgrade can include patches, fixes, additional features and support for the latest devices to resolve any problems.

Voltage Supply Issues

CPUs must be set to receive the correct voltages to run properly. They must be set at the proper voltage, or the CPU can be damaged.

RAM

(DDR SDRAM) – DDR SDRAM is a newer form of SDRAM that can theoretically improve memory clock speed to 200 megahertz (MHz) or more.

Cabling Issues

Placing cable near an electrical source can cause signalling problems. Electromagnetic energy can pass through the cable and interfere with the data being transmitted by that cable.

Ports

Common port/connection problems are usually found on the following ports:

- Parallel (IEEE 1284)
 - Serial
 - USB
 - FireWire (IEEE1394)
 - AGP Video (AGP x1-x4 Vis AGP Pro)
- Video (female DB-15)

Video Monitor

High performing video cards can overload a lower performing monitor. Overloading the monitor can cause damage to the circuitry. If the monitor is being overloaded by the output of the video card, set the monitor to standard VGA settings of 640 by 480 pixels. Troubleshoot the monitor settings if the problem still occurs.

Soundcards

Intermittent problems or a sound card that will not function usually indicate symptoms of resource conflicts. If the sound card is in conflict with another device, it might operate sporadically.

Power Supply Issues

The power supply converts the current coming from the wall outlet from alternating current (AC) into direct current (DC)

Acts as a Cooling Mechanism

Computer systems perform better if they are properly ventilated and cooled. An onboard fan attached to most power supplies cools the power supply and internal components.

Scanners

A vertical streak or lines on a scanned image will usually be because scanners can pick up dust or smudges can appear on the glass. Use a damp cloth to clean glass. Make sure it is free of dust, dirt and other particles.

SCSI ID Issues

Attach the SCSI controller set to the last SCSI ID, which is SCSI ID 7.

Ultra SCSI 2 cable can be a maximum of 12 metres.

Chapter 14 - Troubleshooting Software

Role of the end user

The troubleshooting process usually begins with the end users because they have the most valuable information.

System Boot Problems

DOS hides some files such as MSDOS.SYS and IO.SYS so that users will not accidentally corrupt them. These two files are the special files in the operating system boot record. Without them, the system cannot boot successfully.

Windows 9x Startup Disk

The Windows 9x Startup disk provides many diagnostic programs and CD-ROM drivers. EXTRACT.EXE command that can be used to copy CAB files from the Windows 98 CD.

.DLL or .VxD files

Two important types of files associated with the Windows operating system are .VxD and .DLL files. A .VxD file is a Virtual Device Driver and is only found in the Windows 9x operating systems. These .VxD files take the place of the device= and loadhigh= commands for devices that are in versions of DOS.

SFC Utility

The Windows operating system includes many tools to make it more stable and dependable such as the System File Checker (SFC). The SFC is a command-line utility that scans the operating system files to ensure that they are the correct Microsoft versions.

DLL files can cause an application to either lock up or not load if it becomes corrupted or is missing.

Upgrade issues

Windows 98 requires a 486DX 66 megahertz (MHz) or faster processor.

No Operating System Found

The "Missing operating system" error message is shown in Figure . If this message appears during startup, it probably indicates a failed hard drive or a damaged or corrupted MBR.

Safe Mode

Safe mode is a troubleshooting tool for Windows. It is similar to the command-line switches for Windows 3.x. Safe mode allows access to Windows using only the most basic drivers.

Virtual Memory Settings

The default paging file size is 2 MB. The recommended paging file size for Windows 2000 is equal to 1.5 times the total amount of RAM. Windows will set a default paging file size during installation.

Dr. Watson Utility

The utility monitors application operations and logs important events in the DRWATSON.LOG file.

DEFRAG.EXE

System performance can be degraded when files are fragmented on the hard drive. As files are added and erased, pieces of files are scattered through the hard drive. This degrades performance and can also cause the system or applications to lockup. Use the DEFRAG.EXE file to start the defrag utility.

SYSEDIT.EXE

Typing sysedit in the Run dialog box of the Start menu will open the **system configuration Editor** tool. The sysedit utility is used to modify text files such as .INI files and the CONFIG.SYS and AUTOEXEC.BAT files.

Windows Policy Editor

The Windows System Policy Editor is a powerful tool that is used to create and edit local registry values to standardize desktop settings, prevent users from modifying hardware and environment settings, and control or restrict user actions.

Registry

USER.DAT – The USER.DAT file contains all of the information that is specific to the user. This file is used to maintain user profiles, such as mouse speed, wallpaper, and colour scheme.

Registry Keys

HKEY_CURRENT_CONFIG

HKEY_CURRENT_USER

HKEY_LOCAL_MACHINE

Enable Boot Logging

If the enable boot logging startup mode is chosen, a NTBTLOG.TXT file will be created. This is similar to the BOOT-LOG.TXT file and contains a listing of all the drivers and services that the system attempts to load during the bootup process. Use this startup mode to determine what device or service is causing the system to fail.

Windows 2000 Recovery Console

The Windows 2000 Recovery Console is a command-line interface that is used to perform a variety of troubleshooting and recovery tasks. These include starting and stopping services, reading and writing data on local drives such as drives that are formatted with the NTFS file system, and formatting hard disks.

Go to the run command window on the start menu and type cmd. This will display the command prompt window. Change to the drive letter of the CD-ROM, then to the I386 folder, and run the winnt32 command with the /cmdcons switch.

Incremental Backup

An incremental backup procedure backs up all the files that have been created or modified since the last full backup. There are two important characteristics of incremental backups. First, they must be used in conjunction with a full backup. Second, any file that is created or modified has its archive bit turned back on so that it will be saved during the next incremental backup.

If a full backup were performed on a Monday, this would reset all the archive bits on the files. On Tuesday, an incremental backup would be performed to a separate tape. This would store all the files modified on Tuesday and reset their archive bits. This process is repeated for every business day of the week, each with a separate tape. This provides a complete backup of all files modified during the week. On the following Monday, the entire process would begin again.

Differential Backup

A differential backup procedure backs up all the files that have been created or modified since the last full backup. The difference between a differential backup and an incremental backup is that after a file is saved in a differential backup, the archive bit is not reset. Each time a differential backup is performed, all the files modified or created since the last full backup will be saved again.

If a full backup were performed on a Monday, it would reset all the archive bits on the files. On Tuesday, a differential backup would be performed on a different tape. This would store all the files modified on Tuesday, but it would not reset their archive bits. This process is repeated for every business day of the week, using the same tape. A differential backup will also provide a complete backup of network data in a networked environment.

Print spoolers

The word spooling represents Simultaneous Peripheral Operations On-Line. It refers to the process of loading documents into a buffer, which is usually an area on a hard drive, until the printer is ready. This allows users to place multiple print jobs into a queue and print them in the background instead of waiting for each print job to be completed.

Error messages

Cannot Log Onto Network – NIC Not Functioning

Check the NIC on the back of the system and verify if the NIC LED light is on. A green light usually means that the card is good and does not need to be replaced. PING the card with its local loopback address, which is 127.0.0.1. This sends a packet out and back to the NIC to see if it is functioning properly.

Services

File and Print Sharing is a popular service on nearly every network. If this is not installed, files or printers cannot be shared over the network.

Third Party Driver Installation

During a Windows XP install, a technician needs to install a third party driver for the disk subsystem. When the text mode setup starts, press the F6 key to begin the driver installation.

Task Manager

Task Manager can be accessed by pressing ctrl+alt+del.