

Chapter 14

Overview

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Role of the end user

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Before troubleshooting a computer, talk to end users to gather information regarding their problems. Sometimes end users can explain what they might have done to cause the problem. Determine what they were doing when they began to experience issues. For example, find out what applications they were using or if they were attempting to install or uninstall hardware or software. This information will provide a good starting point for troubleshooting the computer.

Eliciting information from end users can be a tricky process. Some end users will be easy to deal with and they will answer all questions honestly. However, others will not. In a working environment, many end users are limited in what they can do with their computers. The administrator determines the level of access for each user. Unfortunately, many computer problems result from end users that are trying to do something they are not supposed to be doing, such as installing software or downloading files from the Internet. If their systems are not working because of these actions they are less likely to say what is wrong.

Administrators or service technicians usually know more about computers than end users. Be patient with end users and do not get frustrated or say something that makes them feel stupid. A trivial problem that is obvious to the administrator may be something that the end user does not understand. It is important to be polite when eliciting information from end users.

System Boot Problems

The bootup procedure reveals a great deal of information about the status of a system. Some errors can be identified and eliminated during the bootup process. A problem related to the bootup process will prevent the operating system from loading.

The Bootable Disk

Every system administrator should have a bootable disk. Many systems will have issues that cannot be resolved or a corrupt operating system that will prevent the system from booting up. A bootable disk allows administrators to boot from a disk instead of the hard drive. Simply insert the disk into the floppy drive and restart the computer. Make sure that the BIOS is set to boot from the floppy drive.

Hidden Files

A hidden file has a special attribute turned on and is not normally visible to users. For example, hidden files are not listed when the DOS dir command is executed.

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.

Q1. Which two files are hidden to protect them from being accidentally deleted by the user?

Q2. Name the primary source of information when troubleshooting problems with a computer

Troubleshooting startup (booting) problems

Startup issues typically involve problems with hardware, configuration, and boot or operating systems. Some of these problems will simply prevent system activities from occurring, while others will produce error messages that make it easy to find the cause.

Windows 9x Startup Disk

A startup or boot disk allows diagnostic programs to be used to identify the cause of computer problems. The Windows 9x startup disk allows technicians access to the system when the OS becomes corrupted. To use the disk, insert it into the floppy drive and restart the system.

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

Common Windows Operating System Problems

Windows memory usage problems

General Protection Faults (GPFs)

A General Protection Fault (GPF) occurs when an application attempts to access an unallocated memory location.

Windows Resources Low Issues

When the Windows resource level gets too low it can cause applications or the operating system to lock up. This type of error indicates that the operating system is running out of real and virtual memory.

Windows OS missing/corrupt .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. Although it is no longer a widespread problem, some applications may replace system files such as .VxD or .DLL files with different files of the same name. This will eventually prevent a computer system from working. DLL files can cause an application to either lock up or not load if it becomes corrupted or is missing.

System lockup errors

The majority of the system lockup errors occur when a memory allocation error exists or when system resources are too low. Use only one or two applications at a time to help prevent system lockup problems. Pressing Ctrl+Alt+Del will open up the Task Manager.

Upgrade issues

Problems encountered during upgrades to Windows 9x will be related to hardware, software, or both. Before starting an upgrade, consult the Microsoft website to see if the hardware is compatible. Make sure that the hardware meets the minimum system recommendations. The minimum system requirements for Windows 98 are as follows:

- * 486DX 66 megahertz (MHz) or faster processor
- * 16 megabytes (MB) of memory
- * 225 MB of free hard disk space for a full install of Windows 98 on a FAT 16 drive
- * 175 MB of free hard disk space for a full install of Windows 98 on a FAT 32 drive
- * VGA or higher resolution monitor
- * Keyboard
- * CD-ROM drive is optional but recommended
- * High-density 3.5 inch disk drive if no bootable CD-ROM drive is available

Q3. What is the minimum processor speed for Windows 98?

Q4. Which file type is used by Windows 9x to replace the device= and loadhigh=?

Q5. What happens if a DLL file is missing or corrupt?

Q6. What program is used to extract files from the windows 98 CD?

Extract.exe

Xtract.exe

Error codes and startup messages

Error codes that are generated at system startup usually indicate hardware problems, configuration problems, or bootup problems that are associated with the operating system.

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.

Windows Protection Error

This error can occur when a computer loads or unloads a virtual device driver (VxD). The VxD that did not load or unload is usually mentioned in the error message.

Illegal Operation

This error message indicates that a specific program is having a problem. The illegal operation designation covers a wide range of errors. It may take some time to identify the cause.

Windows 9x Startup Modes

Access the Windows 9x Startup Menu by pressing the F8 key when the starting Windows 9x screen is displayed. The menu offers several startup options including normal, logged, safe mode, step-by-step confirmation, and DOS modes.

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.

Q7. Which Windows startup mode allows users to fix a problem that is preventing Windows from booting normally?

Q8. “Missing Operating System” error message usually indicates?

Windows virtual memory errors

Many operating systems such as Windows have huge memory requirements that exceed the amount of physical memory, or RAM, in the system. Even if there is enough physical memory to operate Windows, other applications on the system will require more memory.

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.

Using system tools

Windows 9x and 2000 have many system tools that are helpful when troubleshooting.

Event Viewer

The Event Viewer is used to monitor system, application, and security events in Windows 9x. System events include successful and failed Windows component startups. Application events store information about system applications and their performance. Security events store information related to system security such as logons and logoffs, file and folder access, and the creation of a new Active Directory.

Dr. Watson Utility

The Dr. Watson utility is used to isolate and correct General Protection Faults (GPFs). When the cause of a GPF cannot be traced to the operating system, it is usually caused by an application. The Dr. Watson utility can operate in the background while an application is being used. 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.

Using Windows system editors

The Windows operating systems contain important editors. These editors allow Windows settings to be changed and customized to whatever policy the system administrator desires.

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 AUTO-EXEC.BAT files. The sysedit commands are similar to other Windows-based text editing programs.

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.

Windows System Policy Editor also prevents security problems such as file tampering, data losses as a result of accidental system software changes, or users being locked out of their computers.

Q9. What is the recommended paging size for windows 2000?

Q10. What is the name of the log file that the Dr. Watson Utility creates to monitor application operations?

Q11. What program allows you to easily edit the config.sys autoexec.bat and other ini files?

Q12. Which Windows utility allows an administrator to set up different security restrictions for different users?

The Registry files

The registry files contain all the system configuration information. This includes the local hardware configuration, the network environment, file associations, and user configurations.

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.

SYSTEM.DAT – This file holds hardware profiles, computer-specific profiles, and settings information. When a new piece of hardware such as a video card is installed, the SYSTEM.DAT file is updated.

SYSTEM.INI – The SYSTEM.INI file contains hardware information for the drivers that Windows uses for configuration. When the operating system needs to reference hardware information, it uses the SYSTEM.INI file.

WIN.INI – The WIN.INI file contains parameters that can be altered to change the Windows environment or software settings based on user preferences.

The Registry structure

HKEY_USERS – Contains the system default settings data that is used to control individual user profiles and environments such as desktop settings, Windows environment, and custom software settings.

HKEY_CURRENT_CONFIG – Contains data on the active hardware profile that is selected during the boot process. This information is used to configure settings for the device drivers to load and for the display resolution to use.

HKEY_CLASSES_ROOT – This subtree contains software configuration data for all software installed on the computer.

HKEY_CURRENT_USER – Contains data about the current user logged onto the computer. Retrieves a copy of each user account that is used to log on to the computer and stores it in the registry.

HKEY_LOCAL_MACHINE – Contains all configuration data for the computer, including hardware and operating system data such as bus type, system memory, device drivers, and start-up control data. Applications, device drivers, and the operating system use this data to set the computer configuration. The data in this subtree remains constant, regardless of the user.

Q13. Which registry related file contains information such as a users wallpaper or colour scheme?

Q14. Which of these are valid Windows XP Registry Keys?

HKEY_CURRENT_USER

HKEY_CURRENT_CONFIG

HKEY_LOCAL_MACHINE

HKEY_LOCAL_USER

HKEY_CURRENT_CLASSES

Windows 2000 Startup Modes

Windows 2000 also provides a choice of startup modes. In addition to the safe mode options available in Windows 9x, Windows 2000 provides an Advanced Options Menu with additional features.

Enable Boot Logging

If the enable boot logging startup mode is chosen, a NTBTLOG.TXT file will be created. This is similar to the BOOTLOG.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.

Enable VGA Mode

Use the enable VGA startup mode if any display problems are experienced while booting up. This mode will load the standard VGA driver instead of the driver for the video card. Boot into VGA mode and reconfigure the display setting

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.

There are many ways to start the recovery console. First try inserting the Windows 2000 CD-ROM into the CD-ROM drive and wait for the Microsoft Windows 2000 CD dialog box to open. If this does not work, 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. After the recovery console is installed it can be accessed from the Please Select Operating System To Start menu.

Q15. What file is created if Windows 2000 Boot logging is enabled?

Q16. Which Windows 2000 troubleshooting tool provides a command line to perform tasks such as starting services or formatting hard disks?

Q15. Which command will allow you to install the Windows 2000 Recovery Console so that it will be displayed on the OS startup menu?

Windows Data Backup and Recovery

There are many ways to back up data and applications. Windows comes with backup utilities installed with the operating system, or third party utilities can be purchased to back up data and applications. The chosen backup method will depend on the type and amount of data that is being backed up. In Windows 2000, the Backup Wizard can be used by executing the NTBACKUP command.

Normal Backup

A normal backup is also called a full backup. During a normal backup, all files on the disk are stored to tape and the archive bit for all files is set to off or cleared.

A full daily backup only requires one tape to restore the data, but it is impractical to run a full backup each day because of the amount of time it requires. Copy backups and daily backups do not reset the archive bit and both are used to back up selected files.

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.

Copy Backup

Copy backups are used to back up files selected by a user. A copy backup does not reset the archive bit after saving a file.

Daily Backup

Daily backups only back up the files that are modified on the day of the backup. Daily backups do not reset the archive bit.

Q16. It is the IT department employee's responsibility to perform differential backups of file server data. The employee performs a full backup on Monday and differential backups on Tuesday, Wednesday, and Thursday. On Friday morning, the server crashes and all of the data must be restored. Which backup tapes need to be loaded, and in what order?

Q17. Which backup type sets the archive bit to off?

Windows-Specific Printer Software Problem Troubleshooting

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. The print spooler is the printer managing function and its support components are integrated into a single

Error messages

Cannot Log Onto Network – NIC Not Functioning

One error message that is typically related to networking issues is “Cannot log onto Network - NIC not functioning”. This message can appear for several reasons. For example, the Network Interface Card (NIC) may need to be replaced. This can be done by opening the systems case and replacing the old NIC with a new one. 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. If a message appears stating that the packet was not received, then the NIC is bad and will need to be replaced.

Incorrect service selection

Network services provide added features to clients on the network. For example, 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.

Q18. If _____ is not turned on it will not allow files or printers to be shared over the network

Q19. What is the first thing you should check if “Cannot Log Onto Network - NIC not functioning” displays?

Q20. What command allows you to check if a network is responding on you local computer, or whether a remote machine is available?