

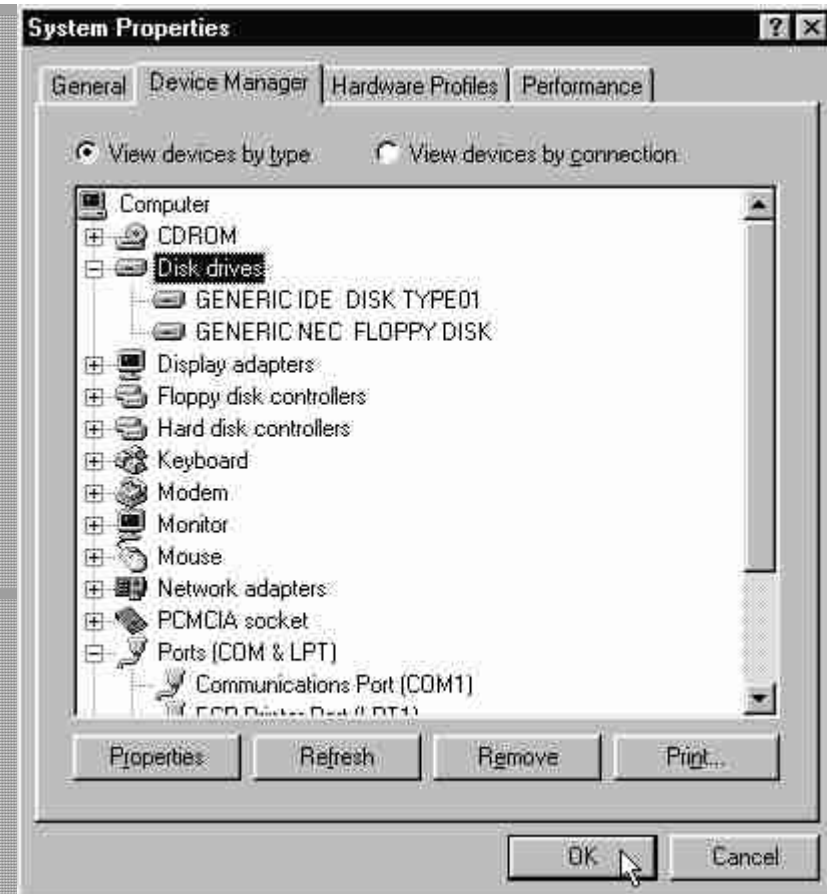
Advanced PC Troubleshooting

Using the Device Manager

- Accessing the Device Manager
 - Double-click the System icon in the Control Panel and click the Device Manager tab.
 - Right-click My Computer, select Properties from the menu and click the Device Manager tab.

Using the Device Manager

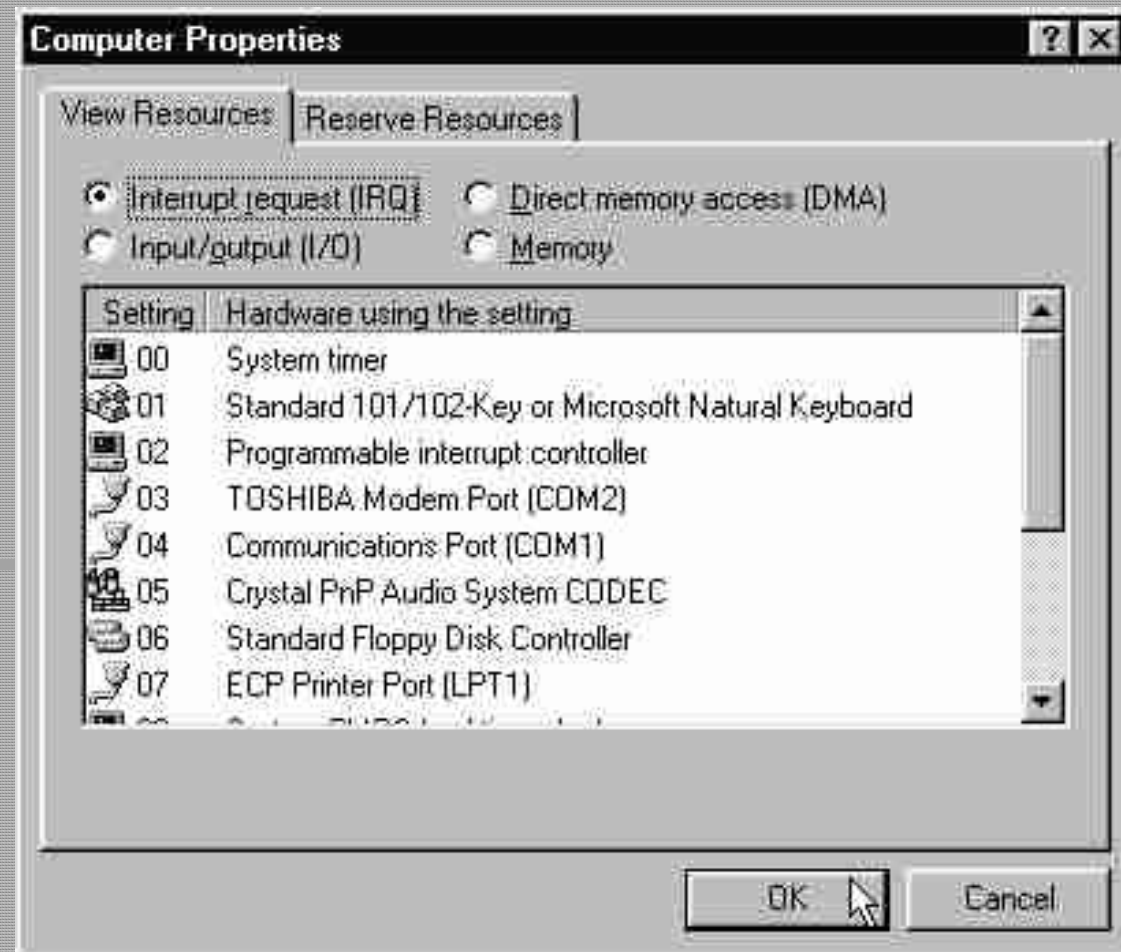
- Viewing Devices
 - Viewing by type
 - Viewing by connection



Using the Device Manager

- Computer Properties
 - Accessed by clicking My Computer in the Device Manager and then clicking the Properties button
 - Can also be accessed by double-clicking My Computer in the Device Manager
 - Current resource use can be viewed
 - IRQs, I/O addresses, DMA channel use and memory use can be viewed

Using the Device Manager



Using the Device Manager

- Changing Device Resources
 - Double-click the device.
 - Click the Resources tab.
 - Click the specific resource that you want to change.
 - Uncheck the “Use automatic settings” check box.
 - Click the Change Setting button.
 - Enter the new setting and make sure it does not conflict with another device.

Connectivity Issues

- Four General Categories of Network Problems
 - The physical environment
 - Electrical problems
 - Viruses
 - Security

Connectivity Issues

- The Physical Environment
 - Temperature
 - Air quality
 - Magnetism

Connectivity Issues

- Electrical Problems
 - Crosstalk
 - Noise
 - Static
 - Transients

Connectivity Issues

- Viruses
 - Destructive programs that are normally attached to executables or found as macros
 - Protection is usually obtained by a combination of policies and software
 - Install anti-virus software
 - Maintain a strict policy governing the use of downloaded files and files on diskettes

Connectivity Issues

- Security
 - Inability to connect to a network resource may be due to security
 - Failure to assign proper permissions to the resource
 - Failure to enter the proper password or user ID
 - Windows NT passwords are case-specific

Connectivity Issues

- Troubleshooting the NIC
 - Card settings
 - IRQ
 - I/O
 - Connection port
 - Use the Device Manager on Windows
 - NT won't allow direct hardware access, so most diagnostic utilities won't work (boot to DOS)

Connectivity Issues

- Troubleshooting Your Cable
 - Thinnet
 - Diagnostic equipment
 - Moving the terminating resistors to locate a bad section of cable
 - UTP
 - Check the indicator lights on the hub
 - Check to see if the connectors are wired correctly

Connectivity Issues

- Troubleshooting Your Hub
 - Diagnostic lights
 - Power off and then back on
 - Use the reset button
 - Bring up one workstation at a time

Connectivity Issues

- Network Drivers
 - Make sure you are using the proper driver.
 - Try to use a compatible driver (NE2000).
- Protocols
 - Make sure you are using the proper protocols.
 - Are the protocols configured properly?
- Proper Security to Access the Resource

Connectivity Issues

- TCP/IP Basics and Testing Connectivity
 - Using:
 - winipcfg
 - nbtstat
 - ping
 - arp

Connectivity Issues

- Network Neighborhood
 - Browser basics
 - Workgroups
 - Keeping users who access the same resources in the same workgroup or domain results in faster and easier browsing.
 - Domains
 - Computers

LAN and WAN Connectivity

- Network Neighborhood

- Why can't you see other computers?

- File and/or Print Sharing not loaded on the other computers

- Load File and/or Print Sharing on all computers that you want to be seen in the Network Neighborhood.

- Protocols not loaded or incorrectly configured

- Make sure you have properly configured protocols and that you are using the same protocols on all the computers on your network.

- Master browse list not updated yet

- Try to connect to the shared resource manually using UNC's (Universal Naming Conventions).

Connectivity Issues

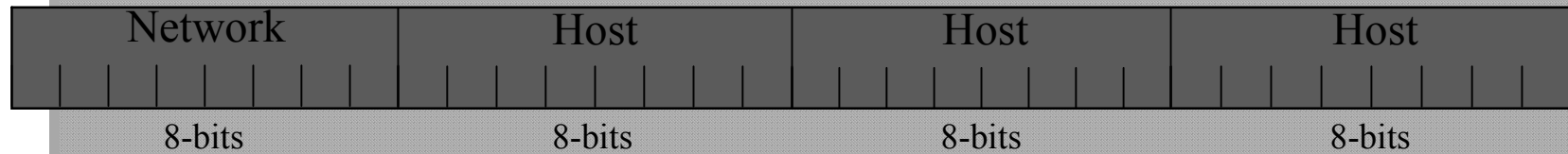
- IP Addressing
 - 32-bit (4-byte) address with two parts
 - Network number
 - Host number
 - Each byte is converted into a decimal number between 1 and 255 and they are separated by periods.
 - Example: 100.100.100.100

Connectivity Issues

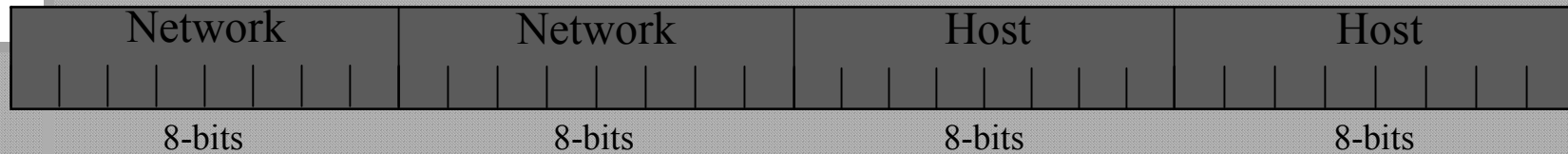
- IP Addressing
 - Three common IP address classes
 - A 1-126 ~16 million hosts
 - N.H.H.H
 - B 128-191 ~64,000 hosts
 - N.N.H.H
 - C 192-223 254 hosts
 - N.N.N.H

<i>Class</i>	<i>1st Octet</i>	<i>Approx. Max Hosts</i>
<i>A</i>	<i>1 - 127</i>	<i>16,777,214</i>
<i>B</i>	<i>128 - 191</i>	<i>65,534</i>
<i>C</i>	<i>192 - 223</i>	<i>254</i>

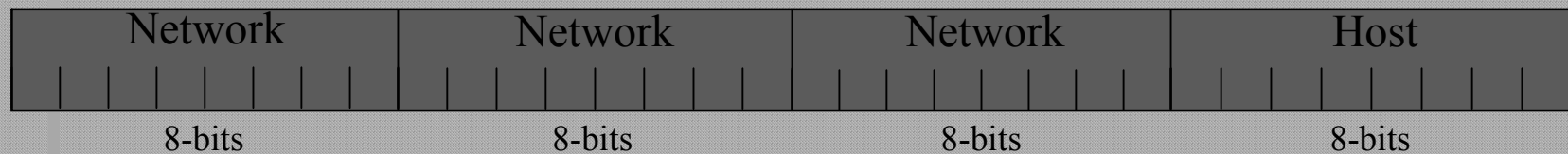
Class A



Class B



Class C



IP Addressing

- IP Addressing
 - Basic Rules
 - Each network must have a unique network address.
 - Each workstation on a network must have a unique host address.
 - Your IP address must be unique to the rest of the world if you are on the Internet.
 - Never use an IP address not assigned to you if you are going to be on the Internet.

IP Addressing

- IP Addressing
 - Subnets and Subnet Masks
 - Subnets allow you to subdivide a larger network into smaller, more manageable units.
 - You must provide a subnet mask.

Subnet Masking

- IP Addressing
 - Benefits of subnetting:
 - Reduced network traffic
 - Optimized network performance
 - Simplified management
 - Facilitates spanning large geographical distances

IP & Subnet

- IP Addressing
 - Default Subnets
 - Class A default subnet
 - 255.0.0.0
 - 11111111.00000000.00000000.00000000
 - Class B default subnet
 - 255.255.0.0
 - 11111111.11111111.00000000.00000000
 - Class C default subnet
 - 255.255.255.0
 - 11111111.11111111.11111111.00000000

IP Binary

- IP Addressing
 - Binary Numbering Convention

Position/Value: 128 64 32 16 8 4 2 1

Binary Example: 0 0 0 1 0 0 1 0

Decimal Equivalent: 16 + 2 = 18

TCP/IP Configuration

- Manually Configuring TCP/IP on Windows 9x
 - Double-click TCP/IP in the Configuration tab of the Network dialog box.
 - Click the Specify an IP Address radio button.
 - Enter the IP address and subnet mask.
 - Click each of the following tabs and enter the appropriate information: WINS, Gateway and DNS.

Notes

- Additional Windows Network Configuration Settings
 - Computer name
 - Should be 8 characters or less if you will be sharing files or printers with DOS clients
 - Cannot be the same as a workgroup or domain
 - Should be something that is easily recognizable to other users on the network

Hidden Shares

- **Creating Hidden Shares**
 - Add a dollar sign (\$) to the end of the share name.
 - The resource will not appear in the Network Neighborhood or any other network browser.
 - You can also provide share-level passwords or user-level security for the resource.
 - Users will have to manually map to the resource and they will have to include the \$ in the name.

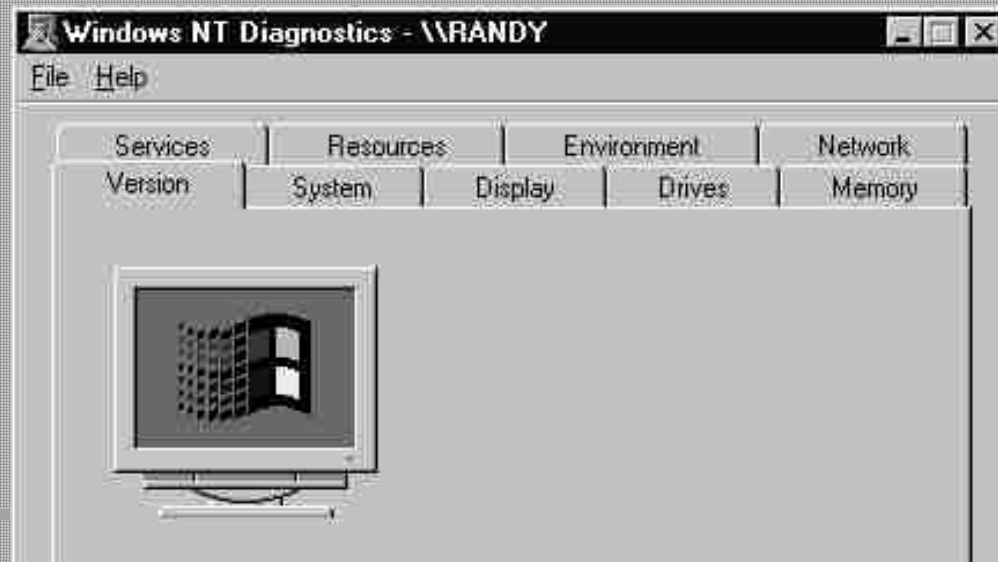
MS's Built-in Troubleshooting Tools

- MSD.EXE (Microsoft Diagnostics)
 - Reports items such as COM ports, parallel ports, IRQs, I/Os and other system resources
 - Should not be run under Windows or previous versions of Windows
 - Only included if your computer was upgraded from a previous version of Windows or MS-DOS

MS's Built-in Troubleshooting Tools

- WINMSD.EXE (Windows NT Diagnostics)
 - Found on the Administrative Tools group
 - Can be executed from a command prompt
 - Displays various information about your system and the resources that are being used
 - System resources cannot be changed with this program like they can with Windows Device Manager

MS's Built-in Troubleshooting Tools



MS's Built-in Troubleshooting Tools

Windows NT Diagnostics - \\RANDY

File Help

Version System Display Drives Memory
Services Resources Environment Network

Include HAL resources

IRQ	Device	Bus	Type
01	i8042prt	0	isa
03	Serial	0	isa
04	Serial	0	isa
05	cs32ba11	0	isa
06	Floppy	0	isa
10	elpc3r	0	isa
12	i8042prt	0	isa
14	atapi	0	isa
15	atapi	0	isa

IRQ I/O Port DMA Memory Devices

Properties Refresh Print OK

Windows NT Diagnostics - \\RANDY

File Help

Services Resources Environment Network
Version System Display Drives Memory

Totals		Physical Memory (K)	
Handles	4,092	Total	65,076
Threads	225	Available	6,676
Processes	30	File Cache	19,308

Commit Charge (K)		Kernel Memory (K)	
Total	62,684	Total	18,864
Limit	115,520	Paged	16,416
Peak	63,000	Nonpaged	2,448

Pagefile Space (K)			
Total	61,440		
Total In Use	23,332		
Peak Use	25,188		

Pagefile	Total (K)	In Use (K)	Peak Use (K)
C:\pagefile.sys	61,440	23,332	25,188

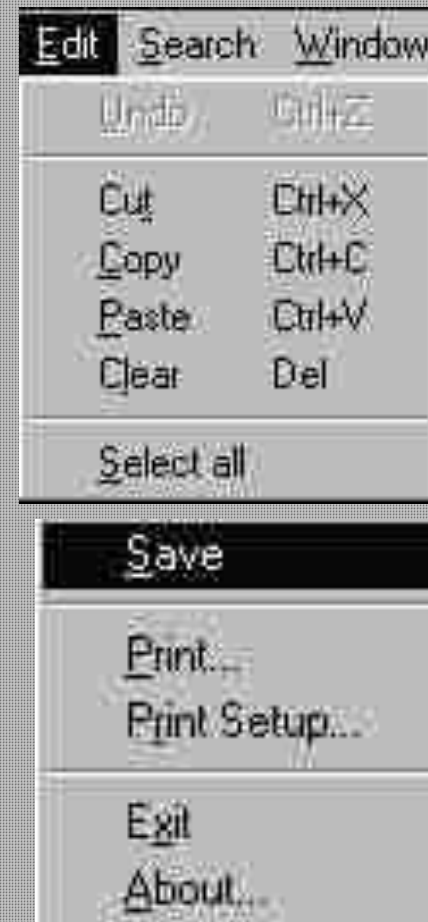
Properties Refresh Print OK

MS's Built-in Troubleshooting Tools

- Using Sysedit
 - Used to edit Autoexec.bat, Config.sys, Win.ini, System.ini, Protocol.ini and other ini files
 - Opens all the system files simultaneously
 - Can be accessed by selecting Run from the Start menu and typing sysedit in the Run dialog box
 - Files must be saved using the Save command from the File menu after editing them

MS's Built-in Troubleshooting Tools

- Sysedit Options
 - Cut, Copy and Paste
 - Search
 - Can be case sensitive
 - Clear
 - Select all
 - Save
 - Print



MS's Built-in Troubleshooting Tools

- Using Sysedit to Identify Driver Conflicts
 - First, check the Performance tab of the System program found in the Control Panel.
 - Determine whether all systems are using 32-bit drivers.
 - View your Config.sys file
 - REM all Device= statements
 - Reboot and then recheck to see if all systems are functional and using 32-bit drivers.

The Registry

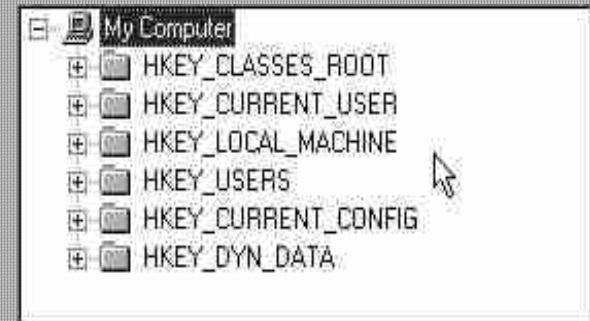
- Purpose
 - Replaces many of the functions of .INI files
 - Centralizes the settings for the operation of the computer
 - Central repository for hardware, software and application settings
 - Less accessible than the old .INI files

The Registry

- Where Does the Registry Reside?
 - Three main locations
 - SYSTEM.DAT
 - Most hardware and software configuration settings
 - USER.DAT
 - User information
 - Virtual Registry
 - Files that are created when the system is started
 - Read-only access for the user
 - Information relating to the performance of the system is stored here

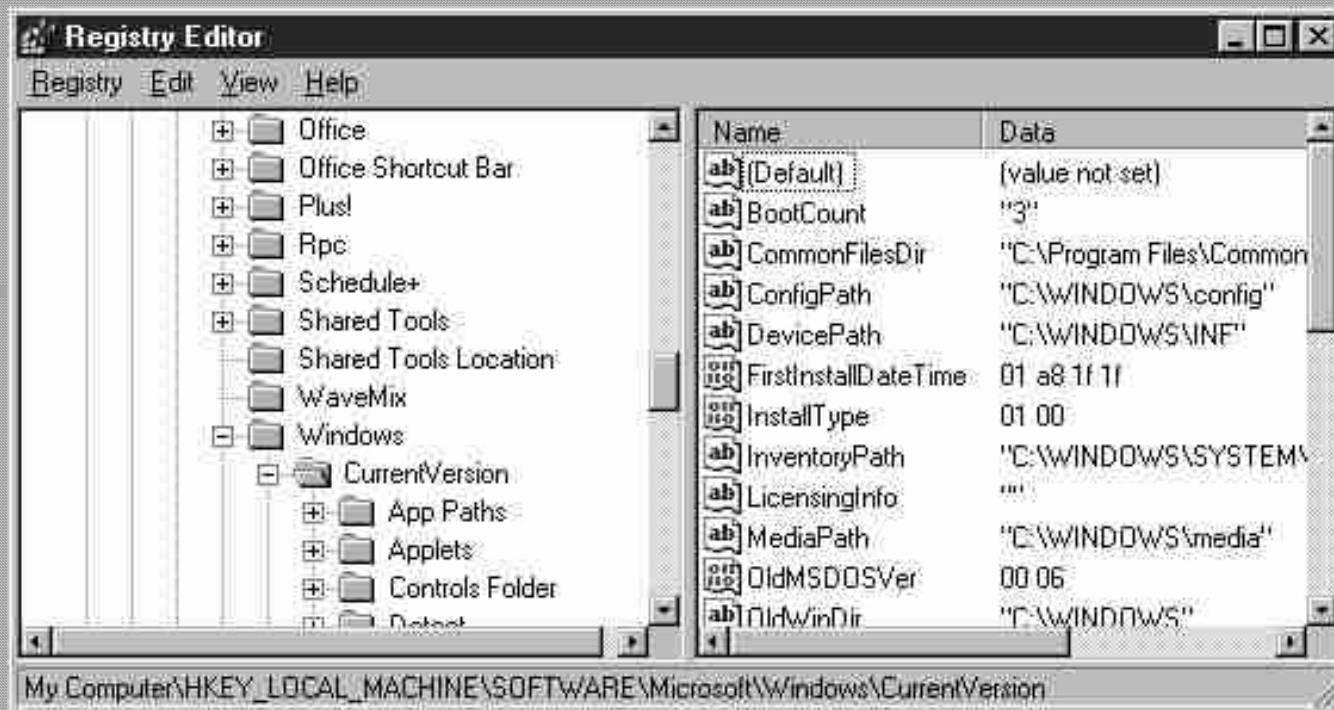
The Registry

- Registry Layout
 - HKEY_CLASSES_ROOT
 - HKEY_CURRENT_USER
 - HKEY_LOCAL_MACHINE
 - HKEY_USERS
 - HKEY_CURRENT_CONFIG
 - HKEY_DYN_DATA



The Registry

- Inside the Keys
 - Subkeys
 - Value entries
 - Value name
 - Data type
 - Value



The Registry

- Searching the Registry
 - Find command found on the Edit menu
 - Click on the key that you want to search through.
 - Click on the Edit menu and select Find.
 - Enter the information you want to find.
 - Check the possible locations for your information, such as keys, values names or data.
 - Click the Find Next button to begin your search.

The Registry

- Editing the Registry
 - REGEDIT.EXE for Windows
 - Creating a shortcut on your Desktop for REGEDIT
 - Right-click your Desktop and select New|Shortcut.
 - Enter regedit in the Command line text box and click Next.
 - Enter Registry Editor to identify the shortcut in the Select a Title for the Program dialog box, and then click the Finish button.
 - REGEDT32.EXE for Windows NT

The Registry

- Commands in Regedit
 - File
 - Import Registry File
 - Export Registry File
 - Connect Network Registry
 - Disconnect Network Registry
 - Print

The Registry

- Commands in Regedit

- Edit

- New

- Delete

- Rename

- Find

- Find Next

You will need to use shortcut keys for Cut, Copy and Paste.

The Registry

- Commands in Regedit
 - View
 - Status Bar
 - Split
 - Refresh

The Registry

- Running Regedit from DOS
 - A copy of Regedit is placed on the startup disk.
 - Only a command line interface much like the old Edlin program
 - Switches
 - /? - Shows command line syntax
 - /L:system - Location of SYSTEM.DAT
 - /R:user - Location of USER.DAT
 - /E filename - Creates a Registry (.reg) file
 - /C filename - Replaces the entire Registry with the contents of the specified .reg file

The Registry

- Additional Information
 - Back up before you edit.
 - Consider other options such as the Control Panel first.
 - You cannot add a top-level key.
 - Each subkey name within a parent key must be unique
 - Double-clicking a value allows you to modify it.

The Registry

- Remote Registry Editing
 - Requires user-level access
 - Microsoft Remote Registry Service must be running on both machines (Windows)
 - Windows NT using Regedt32 can edit the Windows Registry
 - Permission for remote administration must be granted on the remote machine

The Registry

- Backing Up the Registry
 - Microsoft Configuration Backup (CFGBACK.EXE)
 - Emergency Recovery Utility (ERU.EXE)
 - .REG files

The Registry

- Microsoft Configuration Backup (CFGBACK.EXE)
 - Windows CD - \OTHER\MISC\CFGBACK or on the Windows Resource Kit
 - Allows you to create nine backups, but you can delete backups and continue to create more
 - Must be run under Windows
 - Won't back up separate user settings

The Registry

- Emergency Recovery Utility (ERU.EXE)
 - Windows CD - \OTHER\MISC\ERU
 - Backs up critical system files to a diskette and places ERD.EXE on the diskette
 - ERD.EXE runs from DOS
 - May not get all the system files and gives no warning if all the files weren't placed on the diskette
 - May hang if a file is missing

The Registry

- Using .REG Files
 - You can export your entire Registry to a .REG file, which can be imported later if your Registry gets corrupted
 - Regedit is used to export and import the file
 - Can be used even if Windows can't start in GUI mode

The Registry

- Other Restore Techniques
 - Let Windows try to fix itself
 - You will see a dialog box with an option to allow Windows to try to fix itself
 - Restore in DOS mode by replacing the SYSTEM.DAT and USER.DAT files
 - Replace SYSTEM.DAT with SYSTEM.DA0.
 - Replace USER.DAT with USER.DA0.
 - Last resort - Replace SYSTEM.DAT with SYSTEM.1st found in the root.

The Registry

- Bulletproofing the Registry
 - Limit access to the Registry editing tools
 - Create user profiles
 - Create system policies

The Registry

- Limiting Access to Registry Editing Tools
 - Do not allow access to the Windows CD.
 - Disallow access to CD-ROM drives with a system policy.
 - Restrict access to the Registry Editor with a system policy.
 - Restrict booting in MS-DOS mode by setting computers to boot to the hard drive first and by not informing users of the F8 boot option.
 - Remove REGEDIT.EXE from the local drive.

Getting Around System Crashes

- Boot Options
 - Safe Mode
 - Safe Mode with Networking
 - Step-by-Step Confirmation
 - Logged
 - Command Prompt
 - Safe Mode Command Prompt

Getting Around System Crashes

- Safe Mode
 - F5 or F8 and select it from the list
 - Only device drivers that are necessary to allow GUI mode to run are loaded
 - Can be used to change device settings such as IRQ and I/O
 - Control Panel will function but no network support will be available
 - Changes should be made one at a time to determine the problem

Getting Around System Crashes

- Safe Mode with Networking
 - Loads Windows networking support features
 - Allows you to access network resources to help repair the problem
 - Allows you to back up your local drive to a network drive or device in the event a total system reload is necessary

Getting Around System Crashes

- Step-by-Step Confirmation
 - Allows you to walk through the boot process and selectively by pass actions to isolate possible problems
 - Should be used if you suspect a problem in your boot files such as CONFIG.SYS or AUTOEXEC.BAT

Getting Around System Crashes

- Logged
 - Creates a file called BOOTLOG.TXT
 - The file can be viewed to determine the possible problem
 - Search for “LoadFailure”
 - LoadFailure will most likely be at or near the end of the file
 - When a device fails to load, first examine the settings for the device to ensure there are no conflicts

Getting Around System Crashes

- Command Prompt
 - IO.SYS, MSDOS.SYS and COMMAND.COM are loaded
 - You can access your hard drive as long as it has not been compressed
 - May be used to replace missing or corrupt files
 - REGEDIT.EXE can be executed in this mode

Getting Around System Crashes

- Safe Mode Command Prompt
 - Nearly identical to Command Prompt mode, but it loads Microsoft disk compression support
 - Should be used if you require access to compressed drives
 - Can be used in the same way that Command Prompt mode is used

Windows Dynamic Link Library Files (.dll)

- Dynamic Link Library Files
 - Modules containing functions to which a program links at runtime
 - Calling application has a line of code that references the DLL to retrieve information
 - DLL information can be stored in memory and released when not needed
 - Allows smaller memory models to be used when creating applications

Windows Dynamic Link Library Files (.dll)

- Dynamic Link Library Files
 - Several applications may make use of the same DLL
 - Older applications may overwrite newer DLLs, which can cause system problems
 - DLLs that are no longer needed due to the fact that their parent program has been removed are called Orphan DLLs

Windows Dynamic Link Library Files (.dll)

- Removing Orphaned DLLs
 - Manually removing orphaned DLLs can be very time-consuming and is rarely totally successful.
 - Any applications that use the Install Shield can be uninstalled using the Add/Remove Programs icon in the Control Panel; their DLLs will also be removed during this process.

Windows Dynamic Link Library Files (.dll)

- Removing Orphaned DLLs
 - Using Add/Remove Programs
 - In the Control Panel, double-click the Add/Remove Programs icon.
 - Select the Install/Uninstall tab.
 - Select the application that you would like to remove, and click the Add/Remove button.
 - Windows will start the Uninstall program and remove the program, all support files and Registry settings.
 - Be careful about removing shared files. Make sure you no longer need them. When in doubt, leave them.
 - Windows will prompt you to finish the uninstall. Click the Finish button to complete the process.

Windows Dynamic Link Library Files (.dll)

- Third-party Removal Methods
 - Clean Sweep
 - Error Scan
 - Norton Utilities
 - DLLaGator
 - Shaftel Software's DLL Master