

# Understanding the Boot Process and Command Line - Chapter #3

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## Key Terms

1. **Active Partition** – the primary partition on the hard drive that boots the OS. Windows NT/2000/XP calls the active partition the system partition.
2. **Autoexec.bat** – Stands for automatically executed batch file, the file that DOS automatically executes when a computer boots up. This is a convenient place to put commands you always want to execute at the beginning of a computing session. For example, you can set system parameters such as the date and time, and install memory-resident programs.
3. **Batch File** – A file that contains a sequence, or batch, of commands. Batch files are useful for storing sets of commands that are always executed together because you can simply enter the name of the batch file instead of entering each command individually.
4. **Boot Record** – The first sector of a floppy disk or logical drive in a partition; it contains information about the disk or logical drive. On a hard drive, if the boot record is in the active partition, then it is used to boot the OS. Also called boot sector.
5. **Bootable Disk** – For DOS and Windows, a floppy disk that can upload the OS files necessary for computer startup. For DOS or windows 9x/Me, it must contain the files Io.sys, Msdos.sys, and Command.com.
6. **Booting** – Comes from the phrase “lifting yourself up by your bootstraps” and refers to the computer bringing itself up to an operable state without user intervention. Refers to either a “soft boot” or a “hard boot”.
7. **Cabinet File** – A file with a .cab extension that contains one or more compressed files and is often used to distribute software on a disk. The Extract command is used to extract files from the cabinet file.
8. **CD (change directory) command** – A command given at the command prompt that changes the default directory, for example CD\Windows.
9. **Cold boot** – (Same as a hard boot) Restart the computer by turning off the power or by pressing the restart button.
10. **Command.com** – Along with Msdos.sys and Io.sys, one of the three files that are the core components of the real-mode portion of Windows 9x/Me. Command.com provides a command prompt and interprets commands.
11. **DOS box** – A command window.
12. **Emergency Startup disk (ESD)** – (Same as a rescue disk or startup disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.
13. **External Command** – Commands that have their own program files.

14. **Fragmented File** – A file that has been written to different portions of the disk so that it is not in contiguous clusters.
15. **Hard Boot** – (Same as a cold boot) Restart the computer by turning off the power or by pressing the restart button.
16. **Hidden File** – A file that is not displayed in a directory list. Whether to hide or display a file is one of the file's attributes kept by the OS.
17. **Internal Command** – Commands that are embedded in the Command.com file.
18. **Io.sys** – Along with Msdos.sys and Command.com, one of the three files that are the core components of the real mode portion of Windows 9x/Me. It is the first program file of the OS.
19. **Master Boot Record (MBR)** – the first sector on a hard drive, which contains the partition table and a program the BIOS uses to boot an OS from the drive.
20. **Msdos.sys** – In Windows 9x/Me, a text file that contains setting used by Io.sys during booting. In DOS, the Msdos.sys file was a program file that contained part of the DOS core.
21. **Ntldr** – ( NT Loader) In Windows NT/2000/XP, the OS loader used on Intel systems.
22. **Partition Table** – A table at the beginning of the hard drive that contains information about each partition on the drive. The partition table is contained in the Master Boot Record.
23. **Power-on self test (POST)** – A self-diagnostic program used to perform a simple test of the CPU, RAM, and various I/O devices. The POST is performed by startup BIOS when the computer is first turned on, and is stored in ROM-BIOS.
24. **Program File** – A file that contains instructions designed to be executed by the CPU.
25. **RAM Drive** – An area of memory that is treated as though it were a hard drive, but works much faster than a hard drive. The Windows 9x/Me startup disk uses RAM drive. Compare to virtual memory.
26. **Rescue Disk** – (Same as an Emergency Startup disk (ESD) or startup disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.
27. **Soft Boot** – To restart a PC without turning off the power, for example, in Windows XP, by clicking Start, Turn Off Computer, and Restart. Also called a warm boot.
28. **Startup disk** – (Same as an Emergency Startup disk (ESD) or rescue disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.
29. **System Disk** – Windows terminology for a bootable disk.
30. **Warm Boot** – To restart a PC without turning off the power, for example, in Windows XP, by clicking Start, Turn Off Computer, and Restart. Also called a soft boot.
31. **Wildcard** – A \* or ? character used in a command line that represents a character or group of characters in a filename or extension.

## REVIEWING THE BASICS

1. What is the difference between a hard boot and a soft boot?

A hard boot is turning on the computer from an off position and a soft boot is restarting the computer while it is still on.

2. What three keys can you press to perform a soft boot when using DOS?

Ctrl, Alt, Delete

3. What are the four main parts of the boot process?

(1) Post (2) Loading the OS (3) The OS initializing itself (4) Loading and executing an application

4. What memory address is always assigned to the first instruction in the ROM BIOS startup program?

FFFF0h

5. How does startup BIOS communicate errors during POST if video is not yet available?

Beeps. Short and long beeps indicate an error; the coding for the beeps depends on the BIOS.

6. Name the program that is needed to locate the beginning of the OS on a drive.

Master Boot Record (MBR)

7. List three types of information contained in a hard drive's partition table.

(1) A map to the logical drives on a hard drive (2) How many partitions the drive has and how each partition is divided into one or more logical drives (3) Which partition contains the drive to be used for booting (called the active partition), and where each logical drive begins and ends.

8. Give one example of a file system that can be used on a hard drive.

NTFS

9. What three OS files are necessary to boot to MS-DOS mode? What is the function of each? What additional two files are not required but are used if they are present?

(1) Io.sys (2) Msdos.sys (3) Command.com

Io.sys looks for Msdos.sys, reads it, and uses the settings in it. It then looks on the hard drive for a file named Config.sys. After Config.sys is executed, Io.sys looks for another OS file named Command.com.

Command.com looks for Autoexec.bat, and if found, executes it. Command.com is the program in charge, displaying a command prompt and waiting for a command.

The two additional not required, but will be used if present are (1) Config.sys (2) Autoexec.bat

10. Why is it important not to edit Autoexec.bat with word-processing software such as Microsoft Word or WordPerfect?

Because Word-processing applications place control characters in their document files that prevent the OS from interpreting the file correctly.

11. What is the name of the Windows NT/2000/XP boot loader program?

Ntldr (NT Loader)

12. What is the purpose of the command Device=hymen.sys in the Config.sys file?

It gives real-mode Io.sys access to memory above 1 MB, called extended memory.

13. Give two ways to access a command prompt from Windows 9x/Me.

(1) Click Start, Programs, and MS-DOS Prompt.

(2) Click Start, Run , and enter Command.com in the run dialog box.

14. What are two Windows 2000/XP program files that can provide a command prompt window?

(1) Command.com (2) Cmd.exe

15. How many startup disks are needed to boot Windows 2000 from a floppy disk?

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16. What are the two wildcard characters that can be used in command lines?

\* and ?

17. What is the /S switch used for with the Format command? The /V switch? The /F:size switch?

(1) /S switch – Stores the system files on the disk after formatting. Writes the two hidden files and Command.com to the disk making the disk bootable. Not available under Windows 2000/XP.

(2) /V switch – Allows you to enter a volume label only once when formatting several disks. The same volume label is used for all disks. A volume label appears at the top of the directory list to help you identify the disk.

(3) /F:size switch – Specifies the size of a floppy disk. If the size is not specified, the default for that drive is used.

18. What is the name of the signal directory created when a floppy disk or logical drive is formatted?

Root Directory

19. Name the Windows 98 command that is used to partition a hard drive.

Fdisk

20. The Del or Erase command erases files or groups of files.

21. What command is used to create a subdirectory? To change the current directory? To remove a subdirectory?

Mkdir

22. The Attrib command displays or changes the read-only, archive, system, and hidden characteristics of files.

23. What is a hidden file? Name a Windows 9x/Me file that is hidden.

A file that is not displayed in a directory list.

Io.sys

24. The Recovery Console in Windows 2000 can be used to execute commands when troubleshooting a failed boot.

25. What is the purpose of the Ebd.cab file on the Windows 98 startup disk?

It is a compressed file called a cabinet file, that contains several other compressed files. During startup, the contents of the cabinet file are uncompressed and copied to the RAM drive, because there is not enough space for them on the floppy disk, and the startup disk assumes the hard drive might not be accessible.

26. What icon in the Windows 98 Control Panel is used to create a startup disk?

Add/Remove Programs

27. List the steps to add a shortcut to your Windows desktop to access a command prompt window.

(1) Locate the file (Command.com or Cmd.exe) in Windows Explorer and while holding down the Ctrl key, drag the icon to your desktop.

(2) Click Start, point to Programs (All Programs in Windows XP), Accessories, and Command Prompt. Right click Command Prompt and select Create Shortcut on the shortcut menu.

28. At a command prompt, how must you type long filenames that contain spaces?

Put double quotation marks around the filename. For example; "My long filename.doc"

29. When using a real-mode command prompt, how will DOS display the filename Mydocument.doc?

Mydocum~.doc

30. What is the batch file used by Windows 98 to control loading 16-bit programs?

Autoexec.bat

## THINKING CRITICALLY

1. If a PC boots first to the hard drive before checking the floppy disk for an OS, how do you change this boot sequence so that it first looks on the floppy disk for an OS?

By using the computer's CMOS setup.

2. A PC continues to reboot. You try to solve the problem by booting from a Windows 98 startup disk. You boot to the A prompt and look on the hard drive. Explain a possible source of the problem and describe how to fix it.

The problem could be with the file system on the hard drive. If so, you must use tools native to the OS the computer uses to solve the problem.

3. Explain the difference between the Copy command and the Xcopy command.

The copy command allows the user to copy one or more files to an alternate location. Xcopy is a powerful version of the copy command with additional features; has the capability of moving files, directories, and even whole drives from one location to another.

The Copy command copies a single file or group of files. The original files are not altered.

4. Explain the difference between the Chkdsk and the Scandisk commands.

They both check drives for errors and repair them. Scandisk does a more thorough scan for Windows 9x/Me and basically replaces Chkdsk.

5. You need to make 10 duplicates of one floppy disk. Describe how to do this using two different methods. Which method is better and why?