**DISK OPERATING SYSTEM (DOS)**

MS-DOS is the most popular single user operating system in the world. It was released by Microsoft Corporation of USA in august 1981. IBM (International Business Machines), the pioneer in computer Manufacturers adopted & promoted MS-DOS for its range of personal computers. After this soon it became a defacto operating system for macros. First version of MS-DOS was refined version of OS developed by T.M PETERSON of SEATTLE computers.

DOS is a single-user, single-task operating system with basic [kernel](http://en.wikipedia.org/wiki/Kernel_%28computer_science%29) functions that are [non-re-entrant](http://en.wikipedia.org/wiki/Reentrant_%28subroutine%29): only one program at a time can use them. The DOS kernel provides various functions for programs, like displaying characters on-screen, reading a character from the keyboard, accessing disk files and more.DOS systems utilize a [command line interface](http://en.wikipedia.org/wiki/Command_line_interface). Programs are started by entering their filename at the command prompt. DOS systems include several programs as system utilities and provides additional commands that don't correspond to programs.

The main functions of DOS:

1. DOS translate the command issued of the user in the format that is understood by the computer to execute it, also error message in the format for the user to understand.
2. Manage disk files.
3. Allocate system resources according to the requirement.
4. DOS provides features essential to control hardware devices such as Keyboard, Screen, Disk Devices, Printers, Modems and programs.

**SYSTEM FILES**

The modern DOS operating system is distributed on 3-5 high density floppy disks. It comes with backup utilities and (depending on how the lawyers feel) disk compression drivers. However, all the stuff that goes into C:\DOS and its subdirectories are programs and utilities. The core DOS operating system consists of six files:

1. The **boot sector** is a 512 byte record placed at the beginning of the C: drive when DOS was installed, or placed there subsequently using the "sys c:" command.
2. Two "hidden" files are stored in the root directory of the C: drive. They do not show up in a DIR listing unless the /A switch is used. On IBM PC DOS systems, they are **IBMBIO.SYS** and **IBMDOS .SYS**. On MS DOS systems, they are called **IO.SYS** and **MSDOS.SYS**. These files form the kernel of the DOS system.
3. The IO.SYS file moves the system’s basic I/O functions into memory and then implements the MS-DOS default control programs, referred to as device drivers, for various hardware components. These include the following:
   1. The boot disk drive
   2. The console display and keyboard
   3. The system’s time-of-day clock
   4. The parallel and serial communications port
4. **COMMAND.COM** is the "shell" or command interpreter. It prints out the "C:\&gt " prompt and reads user commands. It also supports BAT files.
5. The user configuration files are **CONFIG.SYS** and **AUTOEXEC.BAT**. The reader is assumed to be familiar with these files.

COMMAND.COM is initially stored in the C:\ root directory. The problem is that OS/2 and Windows NT have their own versions of COMMAND.COM. To avoid confusion, each COMMAND.COM should be stored in the subdirectory that belongs to its particular operating system. In normal use, this means that the DOS version should be in C:\DOS. To relocate it, two statements must be added to the user configuration files:

"SHELL=C:\DOS\COMMAND.COM" is added to CONFIG.SYS.

"SET COMSPEC=C:\DOS\COMMAND.COM" is added to AUTOEXEC.BAT.

The hidden files IBMBIO, IBMDOS, IO, or MSDOS have names that do not conflict with each other or with any system file belonging to any other operating system. They can stay in the C:\ root directory no matter what gets added to the system. This means that the volatile part of the DOS system consists of the boot record, C:\CONFIG.SYS, and C:\AUTOEXEC.BAT.

**TYPES OF COMMANDS**

**Internal Commands**

These commands are automatically loaded into the computer’s memory during the booting process. They are actually included in the Command. Com file, so they will be able to execute immediately when you want. Internet commands were built in DOS shell commands and do not need any external file. Some internal commands are DATE, TIME,VER, DIR, CD, MD ,RD, DEL,COPY CON, EXIT etc.

**External Commands**

Disk resident, or external, commands are found in separate files on your hard disk so that they do not typically consume valuable memory space. They are loaded into memory only as called for. External commands are not really commands at all each external commands request actually runs a program contained in a separate file. These file are called com or exe files. Here are some MS DOS’s external commands. Some external commands are ERASETREE, CHKDSK, ATTRIB etc.

**BOOTING PROCESS**

Booting process is the process that involves loading of DOS from hard disk to the main memory. For loading DOS from main memory involves

1. IO.SYS
2. MS-DOS.SYS
3. COMMAND.SYS

**Here are the steps in the DOS boot process:**

1. The BIOS, having completed its functions, loads the boot code in the master boot record and transfers control to it. The master boot record code begins execution. If the boot device is a floppy disk, the process continues with step 6.
2. The master boot code examines the master partition table. It is searching for two things. First, it must determine if there is an extended DOS partition. Second, it must determine if there is a bootable partition specified in the partition table.
3. If the master boot code finds an [extended partition](http://www.pcguide.com/ref/hdd/file/structPartitions-c.html) on the disk, it loads the extended partition table that describes the first logical volume in the extended partition. This extended partition table is examined to see if it points to another extended partition table. If it does, then that table contains information about the *second* logical volume in the extended partition, so it is loaded and examined. (Recall that logical volumes in the extended partition have their extended partition table chained one to the next.) This process is continued until all of the extended partitions have been loaded and recognized by the system.
4. After loading the extended partition information (if any), the code attempts to boot the primary partition that is marked active (bootable). If there are no partitions marked active, then the boot process will terminate with an error. The error message is often the same one that occurs if the BIOS finds no boot device, and is generally something like "No boot device", but can be the infamous "NO ROM BASIC - SYSTEM HALTED".
5. If there is a primary partition marked active, the code will boot it. The rest of the steps assume this is a DOS primary partition.
6. The volume boot sector is loaded into memory and tested, and the boot code that it contains is given control of the remainder of the boot process.
7. The volume boot code examines the structures on the disk that it is booting to ensure that everything is correct and in the right place. If not, the boot process will end in an error here as well.
8. The code searches the root directory of the device being booted for the operating system files that contain the operating system. For a system running MS-DOS these are the files "IO.SYS", "MSDOS.SYS" and "COMMAND.COM".
9. If the operating system files are not found, the boot program will display an error message, which is usually something like "Non-system disk or disk error - Replace and press any key when ready". Some people think that this message means the system was never booted, that the BIOS examined the floppy disk for example and just rejected it because it couldn't boot it. As you can see from this description of the boot process, the volume boot code was indeed loaded and executed, and in fact it is what prints the message when it can't find the operating system files! [See here for an explanation of why this distinction is so important](http://www.pcguide.com/ref/hdd/file/structViruses-c.html).
10. If the operating system files are found, the boot program will load them into memory and transfer control to them. First, IO.SYS is loaded and its code executed. IO.SYS will then execute MSDOS.SYS (in pure DOS systems--MSDOS.SYS is just a [text file](http://www.pcguide.com/ref/hdd/file/structBoot-c.html) in Windows 95 and later.) Then the more complete operating system code loads and initializes the rest of the operating system structures. For MS-DOS, this means loading the command interpreter (COMMAND.COM) and then reading and interpreting the contents of the CONFIG.SYS and AUTOEXEC.BAT system control files.

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