

ST. LAWRENCE HIGH SCHOOL

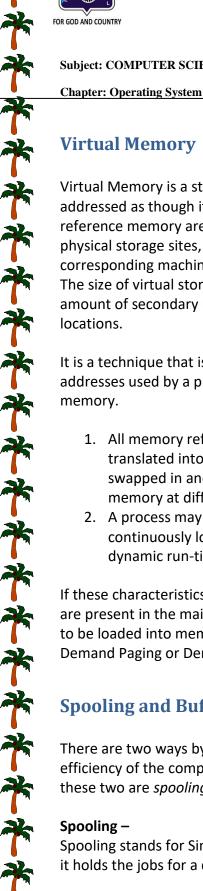
A Jesuit Christian Minority Institution



Subject: COMPUTER SCIENCE

Class - 11

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Virtual Memory

Virtual Memory is a storage allocation scheme in which secondary memory can be addressed as though it were part of main memory. The addresses a program may use to reference memory are distinguished from the addresses the memory system uses to identify physical storage sites, and program generated addresses are translated automatically to the corresponding machine addresses.

The size of virtual storage is limited by the addressing scheme of the computer system and amount of secondary memory is available not by the actual number of the main storage locations.

It is a technique that is implemented using both hardware and software. It maps memory addresses used by a program, called virtual addresses, into physical addresses in computer memory.

- 1. All memory references within a process are logical addresses that are dynamically translated into physical addresses at run time. This means that a process can be swapped in and out of main memory such that it occupies different places in main memory at different times during the course of execution.
- 2. A process may be broken into number of pieces and these pieces need not be continuously located in the main memory during execution. The combination of dynamic run-time address translation and use of page or segment table permits this.

If these characteristics are present then, it is not necessary that all the pages or segments are present in the main memory during execution. This means that the required pages need to be loaded into memory whenever required. Virtual memory is implemented using Demand Paging or Demand Segmentation.

Spooling and Buffering

There are two ways by which Input/output subsystems can improve the performance and efficiency of the computer by using a memory space in the main memory or on the disk and these two are spooling and buffering.

Spooling -

Spooling stands for Simultaneous peripheral operation online. A spool is similar to buffer as it holds the jobs for a device until the device is ready to accept the job. It considers disk as a

********* huge buffer that can store as many jobs for the device till the output devices are ready to accept them. **Buffering** -The main memory has an area called buffer that is used to store or hold the data temporarily that is being transmitted either between two devices or between a device or an **** application. Buffering is an act of storing data temporarily in the buffer. It helps in matching the speed of the data stream between the sender and the receiver. If the speed of the sender's transmission is slower than the receiver, then a buffer is created in the main memory of the receiver, and it accumulates the bytes received from the sender and vice versa. The basic difference between Spooling and Buffering is that Spooling overlaps the input/output of one job with the execution of another job while the buffering overlaps the input/output of one job with the execution of the same job. Differences between Spooling and Buffering -The key difference between spooling and buffering is that Spooling can handle the input/output of one job along with the computation of another job at the same time while buffering handles input/output of one job along with its computation. Spooling stands for Simultaneous Peripheral Operation online. Whereas buffering is not an acronym. Spooling is more efficient than buffering, as spooling can overlap processing two jobs at a time.

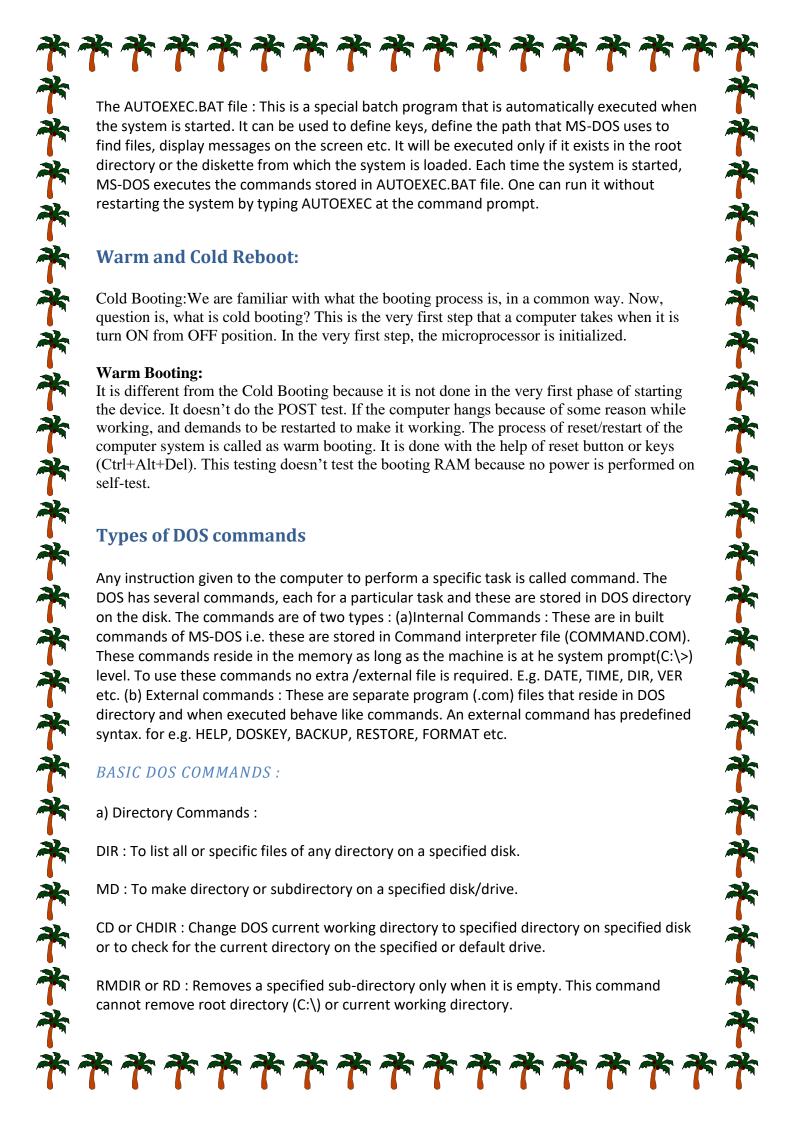
Buffering uses limited area in main memory while Spooling uses the disk as a huge buffer.

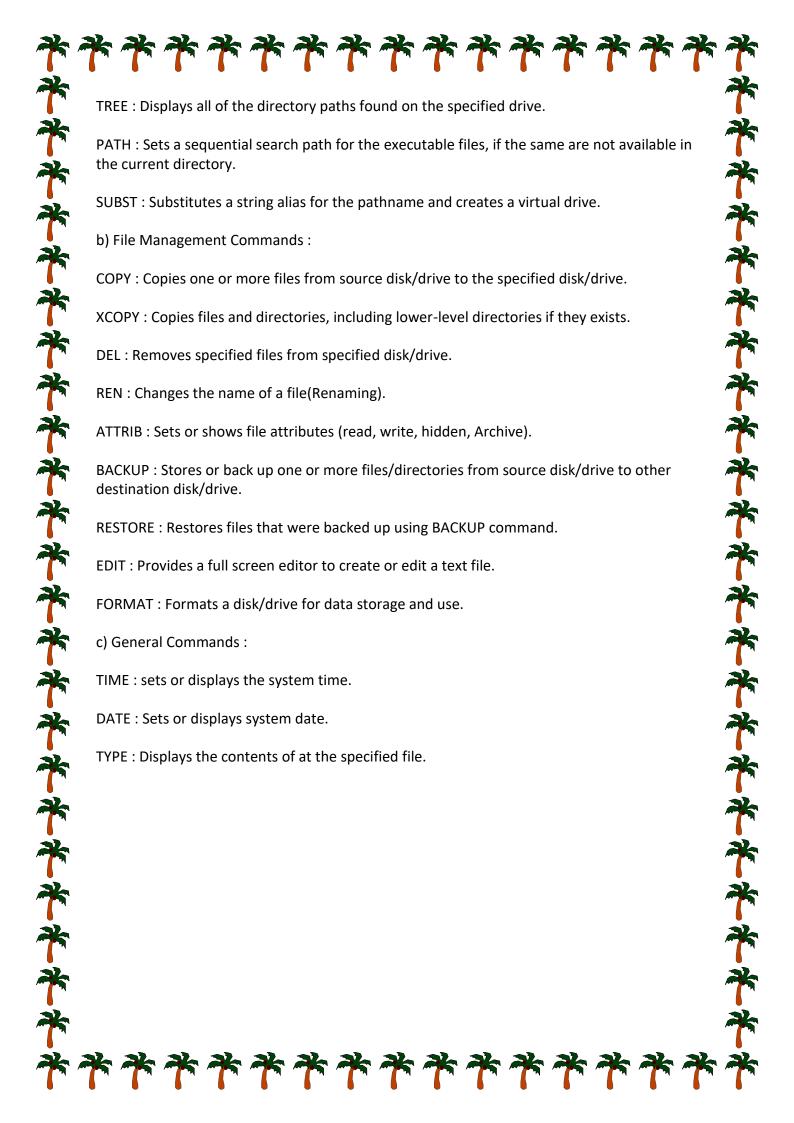
Introduction to DOS / WINDOWS

Though UNIX was a powerful operating system available, but it was not suitable for 8-bit 8086 microprocessor based Personal Computers. So there was a need for a small operating system that could work in 640K memory (RAM). DOS was variant of CP/M (Control Program/Monitor) which ran for the first time on IBM-PC in 1981. It is called so because it resides on Floppy or Hard disk and provides command level interface between user and the computer hardware. The different versions of MS-DOS have evolved over a period of time with Microsoft introducing new features in each new release. Starting with MS-DOS1.1, the latest version was MS-DOS6.22 released in 1994. There are various versions of DOS like MS-DOS(Microsoft), PC-DOS(IBM), Apple DOS, Dr-DOS etc.

WINDOWS was similar to APPLE Mach operating system interface on IBM-PC. The main features of windows are easy to use graphical user interface (GUI), device independent graphics and multitasking support. The first version of windows 1.0 was introduced in 1985. Windows was an application of MS-DOS using the basic commands of DOS. Windows for Workgroup (WIN3.11) released in 1992 was an integrated windows and networking package with file and printer sharing capabilities, a network mail (Microsoft Mail) and a workgroup

********** scheduler (Schedule+) packages in windows environment. WINDOWS-95 released in 1995 is **** a 32-bit operating system which includes MS-DOS7.0 and takes control of computer system after starting. The main features of WINDOWS-95 are: ****** Windows 95 is easier to learn and use than any of its predecessors. Windows 95 and its applications run under the PCs protected mode, which mean that one will behaved program cannot compromise the memory and resources of another. This approach adds a large measure of reliability to the total operating environment. The crash of a single errant program does not automatically crash the operating system or any of other programs that you're running. Windows 95 is a pre-emptive multitasking means that programs running in the background do not significantly degrade the interactive program that you are running in the foreground e.g. you can comfortably type into word processors while your database system backs up all its files. Under Windows 3.1 the typed key displays lagged behind while the backup procedure logged the processor. Windows 95 integrates virtually all of your computing tasks and resources like networks, E-mail, multimedia, system administration, printing, faxing, applications into one common user interface. **Booting** When the computer is switched on, the firmware program in Read Only Memory(ROM) also called Basic Input-Output System(BIOS) reads programs and data i.e. Operating System and loads it into memory (RAM). This process is known Bootstrapping (Booting). The OS once loaded takes control of the computer, handles user interaction and executes application programs. **Booting Sequence** During booting process, computer loads the operating system into its memory. DOS booting involves reading following files into memory namely IO.SYS, MSDOS.SYS, and COMMAND COM. The Basic Input/Output Program (IO.SYS): This program provides interface between the hardware devices and software of the system. It takes care of the keyboard input, character output to monitor, output to printer and time of the day. The File and Disk Manager Program (MSDOS.SYS): It contains the file management and the disk buffering management capabilities. It keeps track of all the disk access of an application program and remains permanently in memory. The Command Processor (COMMAND.COM): It is also called command interpreter. It is the program that displays the system prompt and handles user interface by executing the command typed in by the user using keyboard. The CONFIG.SYS file: This file contains reference to device drivers which are loaded when OS takes control of the computer. These device drivers are required for configuring operating system for running special devices. ********





Answer the following questions: 1. Differentiate between cold booting and warm booting. Ans: Cold Boot Warm Boot Cold booting commonly goes by hard booting in Warm booting is also called as soft booting. computer terminology. The system starts up from a completely The system returns to its original state without powerless state. interrupting power. It completely resets the hardware and clears the It doesn't necessarily reset the components and system off the temporary memory. the power source, thereby keeping the memory intact even after a reboot. A cold boot is usually done when the system A warm boot is generally done when a program doesn't respond to a warm boot. fails to respond and the system freezes in between a session. Shutting it off from the power source or Pressing the ctrl, alt and delete keys unplugging the supply resets the system. simultaneously or initiating a reset command will reboot the system without hampering power. It runs self-diagnosis tests thereby resetting the It forbids a full system diagnosis thereby reducing hardware and memory. the reboot time. 2. Write a short note on virtual memory. Ans: This is done by treating a part of secondary memory as the main memory.

Virtual Memory is a storage scheme that provides user an illusion of having a very big main memory.

In this scheme, User can load the bigger size processes than the available main memory by having the illusion that the memory is available to load the process.

Instead of loading one big process in the main memory, the Operating System loads the different parts of more than one process in the main memory.

By doing this, the degree of multiprogramming will be increased and therefore, the CPU utilization will also be increased.

3. Explain the following DOS commands briefly:

- a. CHDIR: The chdir command is used to display the drive letter and folder that you are currently in. Chdir can also be used to change the drive and/or directory that you want to work in.
- **b. CD**: The cd command is the shorthand version of the chdir command.
- c. CLS: The cls command clears the screen of all previously entered commands and other text.
- d. DEL: The del command is used to delete one or more files. The del command is the same as the erase command.

