SNS COLLEGE OF TECHNOLOGY

Kurumbapalayam (Po), Coimbatore – 641 107

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

COURSE NAME :   **23CST202-OPERATING SYSTEMS**

II YEAR / IV SEMESTER

Unit 1-OVERVIEW AND PROCESS MANAGEMENT

Topic : Process, Memory And Storage Management

- A process is a program in execution. It is a unit of work within the system. Program is a *passive entity*, process is an *active entity*.

- Process needs resources to accomplish its task

- CPU, memory, I/O, files

- Initialization data

- Process termination requires reclaim of any reusable resources

- Single-threaded process has one **program counter** specifying location of next instruction to execute

- Process executes instructions sequentially, one at a time, until completion

- Multi-threaded process has one program counter per thread

- Typically system has many processes, some user, some operating system running concurrently on one or more CPUs

- Concurrency by multiplexing the CPUs among the processes/ threads

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Memory is a large array of words or bytes, each with its own address. It is a repository of quickly accessible data shared by the CPU and I/O devices.

Main memory is a volatile storage device. It loses its contents in the case of system/power failure.

The operating system is responsible for the following activities in connections with memory management:

Keep track of which parts of memory are currently being used and by whom.

Decide which processes to load when memory space becomes available.

Allocate and deallocate memory space as needed.

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Since main memory (*primary storage*) is volatile and too small to accommodate all data and programs permanently, the computer system must provide *secondary storage* to back up main memory.

■Most modern computer systems use disks as the principle on-line storage medium, for both programs and data.

■The operating system is responsible for the following activities in connection with disk management:

☞Free space management

☞Storage allocation

☞Disk scheduling

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An O.S provides an environment for execution of the program

■The O.S provides certain services to program and users of those programs for efficiency and convenience to the programmers

■Program execution –system capability to load a program into memory , to run it, terminate program normally or abnormally

■I/O operations –since user programs cannot execute I/O operations directly, the operating system must provide some means to perform I/O.

■File-system manipulation –program capability to read, write, create, and delete files.

■Communications –exchange of information between processes executing either on the same computer or on different systems tied together by a network. Implemented via *shared memory* or *message passing*.

■Error detection –ensure correct computing by detecting errors in the CPU and memory hardware, in I/O devices, or in user programs.

System calls provide the interface between a running program (Process) and the operating system.

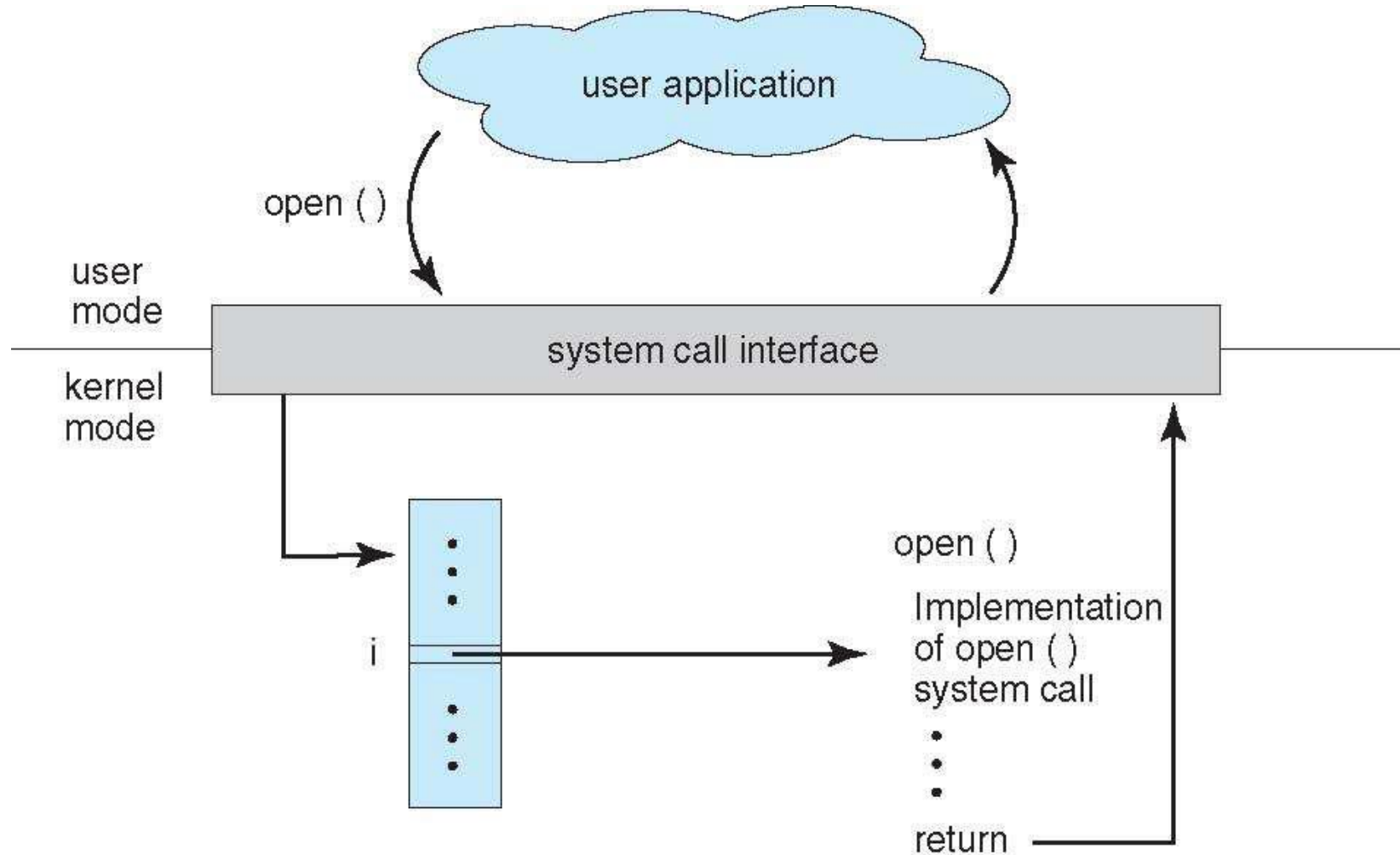☞Generally available as assembly-language , C or C++ instructions.

■Three general methods are used to pass parameters between a running program and the operating system.

☞Pass parameters in *registers*.

☞Store the parameters in a table in memory, and the table address is passed as a parameter in a register.

☞*Push*(store) the parameters onto the *stack* by the program, and *pop*off the stack by operating system.

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08/01/2025　　**OVERVIEW AND PROCESS MANAGEMENT/PROCESS,MEMORY AND STORAGE MANAGEMENT/ DURGALAKSHMI B/AIML/SNSCT**

Process control→(end, abort, load program into memory, execute, create, get/set process attributes(attributes like job's priority & max. allowed execution time), wait (wait for a child process to return/end for certain time), wait for event, signal event, allocate & free memory

■File management →create file, delete file, open, close, read, write

■Device management →Request device, release device, read, write etc

■Information maintenance→get/set time of day, get/set system data etc

■Communications →shared memory or message passing

create/delete communication connection, send/ receive messages etc

MS-DOS Execution(is a single tasking O.S)

(a) At System Start-up
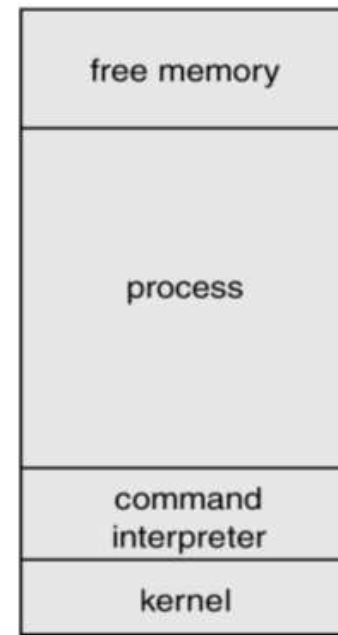
(b) Running a Program

MS-DOS shows the limited capability of multitasking/concurrency with the help of TSRs (terminal & stay resident system calls)

THANK YOU