

Operating System

Operating system is an interface b/w user and computer hardware. The purpose of operating system is

- (i) To provide an environment in which a user can execute a program in a convenient (easy) and efficient manner.
- (ii) Operating system manage all parts of system (comp.) and present to the user with an interface i.e. easy to program and use.
- (iii) The most common operating system used is
 WINDOW 98 WINDOW 7
 WINDOW 2000 WINDOW 8
 WINDOW NT WINDOW 10
 WINDOW VISTA

* All these operating system are designed by Microsoft & its owner is Bill Gates
 Other than these are UNIX, LINUX, UBUNTU, Fedora, Red hat.

MAC :- MACINTOSH. It is developed by Apple.

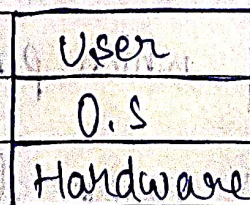
Other systems :- Android - Google product

iOS - Apple

Symbian - Nokia

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Operating System Diagram



App
 H/S System

cpu, monitor,
 RAM, MOU

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Users :- Professional Users, Naive Users, Administrator

Function of Operating System

- 1) Process Management :- It refers to assignment of processor to different task being performed by computer system.
- 2) The operating system is responsible for following activity under process management
 - i) Creating and deleting both user and system process.
 - ii) Suspending and resuming the process.
 - iii) Providing the mechanism for interprocess communication i.e. communication b/w different processes in the system.
 - iv) It provide the mechanism for process synchronization.
 - v) Provide the mechanism for deadlock and handling.

1) Main Memory Management :- Memory is organised as a large arrays of ^{bits}~~words~~ and bytes that store the users program and instruction for executions.

- 1) Main memory is usually shared by operating system and application program. It perform the following activities:-
 - i) Allocating and deallocating memory space to various process.
 - ii) To keep track of which parts of memory are currently used.
 - iii) Maintaining the free space list.
- Memory = RAM

3) Secondary Storage Management :- Secondary storage device store the system program such as compiler, assembler, additonal and user program that are not used frequently. Activity is are following :-

- i) Allocating and deallocating secondary storage.
- ii) Free space management.
- iii) Disk scheduling algorithm.

4) File Management :- File is a storage unit and is a easy collection of a information. It can be categorised on the basis of information stored in it such as data file, source file and object file.

Data File represent the information in numeric, alphabetic or alphanumeric mode.

Files are stored on a storage device such as hard disk, floppy disk or CD etc.

Following activity are performed :-

- i) Creation and Deletion of a file.
- ii) Backing up files on a stable storage (non-volatile storage).
- iii) File Organisation Structure.
- iv) Provide a operation for manipulation such as read, write, copy, paste.

5) Input Output Management :- Input output device attached to the computer system are used to enter the data into system and get the output.

2. This system manage all the input out. devices and contain variety of software program to

handle these devices which are used to manage the communication and control the specific input output device. It perform the following activity:-

- i) Handling of input output devices attached to system
- ii) keep track of resources (devices)
- iii) Allocation of resources (device) and input output schedul.

Input Output Man. or Device Management.

6) Protection And Security:- Important feature of operating system to protect itself from the user processes and to protect user processes from other system processes.

2. Protection mechanism control the access of user programs and processes used by various applications.

3. Protection mech. also used to provide the protection to various resources such as memory, files, and C.P.U. against unauthorised protection.

4. Security deals with protecting the various resources and information of a computer system against unauthorised user or a user.

5. External security deals with the securing the computer system against various ^{factor} such as earthquake, flood, storm, fires, stolen disk or hardware by unauthorized person.

6. Internal security deal with user authentication, Access control, Cryptography.

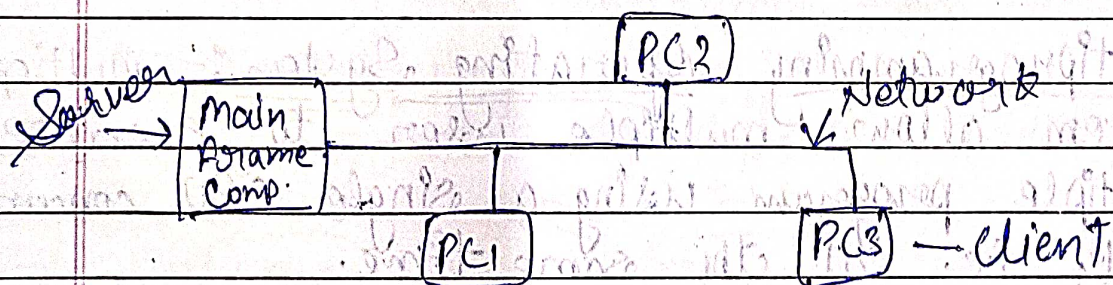
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Classification of Operating System or Types of Operating System.

1. Single User Operating System:- Single user O.S. can access the computer at a particular time.
 - i) It have only single processor and execute only single program at all the time.
 - ii) It is of two types:- (i) Single user single task operating system. eg: MS DOS
 - (ii) Single user multiple task. eg: MS WINDOW
2. Multi User Operating System:- In this system multiple no. of user can access different resource of computer at a same time.
 - i) This operating system is providing using network that consists of various personal computer attached to main frame computer system and main frame computer act as server. And other computer act as client. For eg:- UNIX, WINDOW 2000.



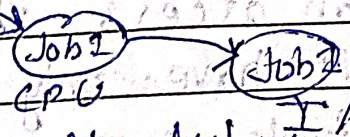
3. Batch Operating System:- It is one of oldest method of running the program and it is also a traditional method to execute the programme.

Batch stands for Queue.

- i) The various jobs (task) of a user are collected in a queue. known as Spooling.
- ii) In this way many different jobs are processed one after the other without any interaction from the user during program execution. Time for execution consist of CPU time and input

output time

Job 4
Job 3
Job 2
Job 1



- i) In this example job 1 is scheduled to CPU. During execution it requires input output construction so job one will be scheduled to input output device.
- ii) Job 2 will not go for execution until job 1 is not completed i.e. CPU will be idle when job 1 is scheduled to input output devices.

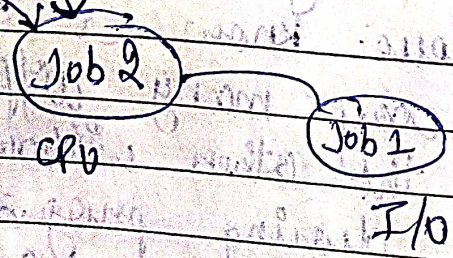
Disadvantages

- i) Increase CPU idleness.
- ii) Decrease through put of a system
Throughput = no. of process completed per unit time.

4. Multiprogramming Operating System:- Multiprogramming system allow multiple user to execute multiple program using a single CPU concurrently i.e. at the same time.

- ii) All the processes are kept in main memory and CPU execute all process concurrently.

Job 4
Job 3
Job 2
Job 1



Advantages

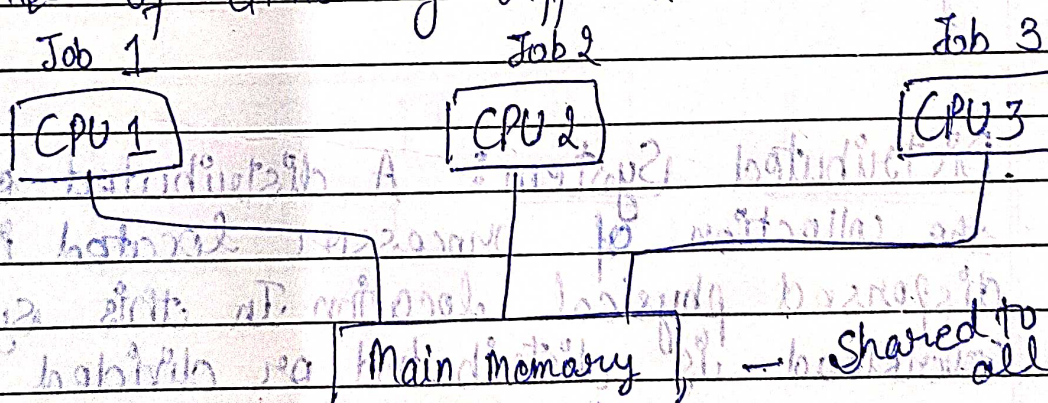
1. Proper utilization of CPU
2. Saving the time.

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Multi tasking operating system:- Technically it is same as multiprogramming operating system. In this multi single user can execute multiple program at the same time whereas multiprogramming is used for multiple user i.e. system can be used by many user at the same time. Multitasking is used for single user system. There are two terms are same.

Multiprocessing operating system:- It is also known as MPE system. It contains two or more processors or C.P.U and has ability to simultaneously execute several task or job or program.

- (i) In this system construction from different and independent program can be processed at the same instance of time by different C.P.U.



* Advantages

- (i) Improve reliability. If one CPU fails the system will still run with the help of remaining CPU. It is also called as fault tolerance.
- (ii) Improve throughput. There is the no. of processes

available to execute multiple task or program on job at the same time.

(iii) Efficient Utilization of all resources

Real time Operating System:- In real time operating system a job is to be completed within the time constraint ^{or bound} otherwise job loss its meaning. A real-time system function correctly only if it return the correct result within its time limit or constraint. For eg: air traffic control system, RADAR system, ROBOT, etc. There are two types of real time operating system.

(i) Hard Real Time Operating System:- If complete the critical task within the definite interval of time. Even minor delay is not acceptable. For eg:- Flight controller system.

(ii) Soft Real Time Operating System:- These are less restrictive in nature and minor delay is acceptable. For eg:- Nuclear power station, Air bags.

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Distributed System:- A distributed system is the collection of processor located in geographical dispersed physical location. In this system workload is distributed or divided b/w two or more computer that are linked together by communication network i.e. different processor communicate using communication links. Such as telephone lines or wireless medium.

(ii) Various processor do not share memory clock or peripheral devices. Instead each processor

has its own local memory.

- (iii) The processor in distributed system varies in size and function. The various processor are also called as nodes, hosts, machine or sites.

For ex. Angle, Alpha kernel Distributed operating Sys.

- Q.1. Comparison b/w multiprogramming operating system and multitasking operating system.
- Q.2. Comparison b/w multiprogramming and multiprocessing operating system.
- Q.3. Comparison b/w batch and multiprogramming O.S.
- Q.4. " b/w soft and hard real time operating system.
- Q.5. What is structure of O.S. explain with help of diagram?
- Q.6. What are various function of O.S.?
- Q.7. What is operating system. Also write 've eg. of various O.S. available in the market.
- Q.8. What are various advantages of distributed system?

