

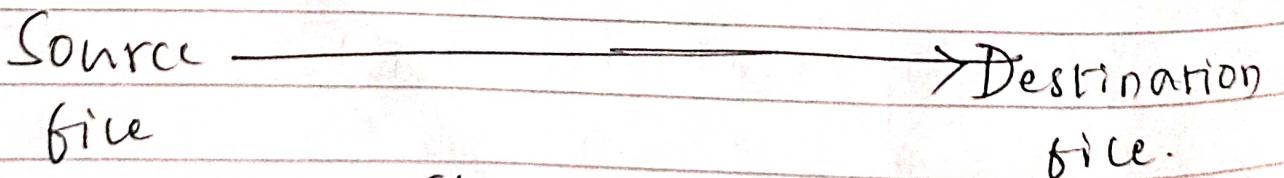
## ①) operating s/m

- An operating s/m. is a program that manages a computer's hardware, also provides a basis for application programs.

## ②) System calls.

- system calls - provide an interface to the services made available by an operating system.
- These calls generally available as routines written in C. and C++.

### S/M call sequence.



#### S/M call sequence.

- Acquire i/p file name
- write prompt to screen
- Accept i/p
- Acquire o/p file name
- write prompt to screen
- Accept o/p

open input file  
 if file does not exist, abort  
 create o/p file.  
 if file exists, abort  
 loop.  
 Read from i/p file.  
 write to o/p file  
 until read fails  
 close o/p file.  
 Write completion msg to screen.  
 Terminate.

### ③ Computing environments.

- \* a network operating sys. is an operating sys. that provides features such as sharing file across network, etc.
  - \* the different computers communicate closely enough to provide the illusion that only a single operating sys controls the outcome.
- (\*) ① client-server Computing.  
 ② Peer-to-peer Computing.

## ① Client - server Computing

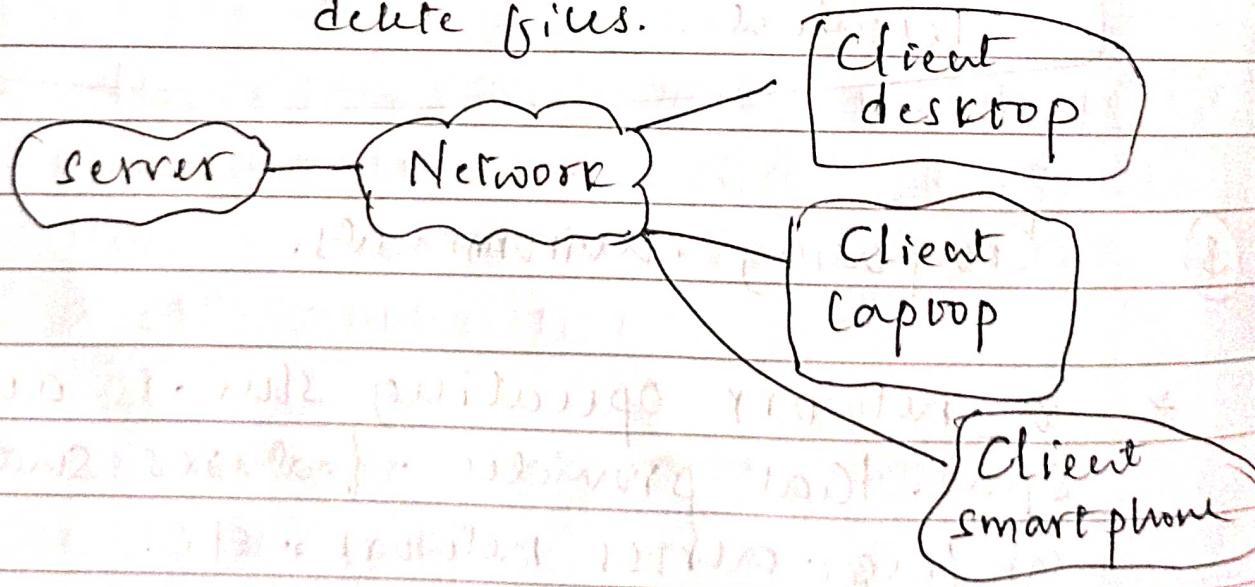
- servers & s/m can be broadly categorized as computer servers and file servers;

### ① Computer - server s/m.

- it provides an interface to which a client can send a request to perform an action.

### ② file - server s/m.

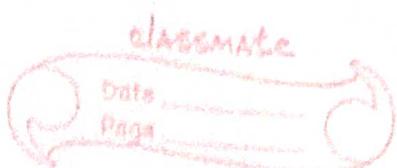
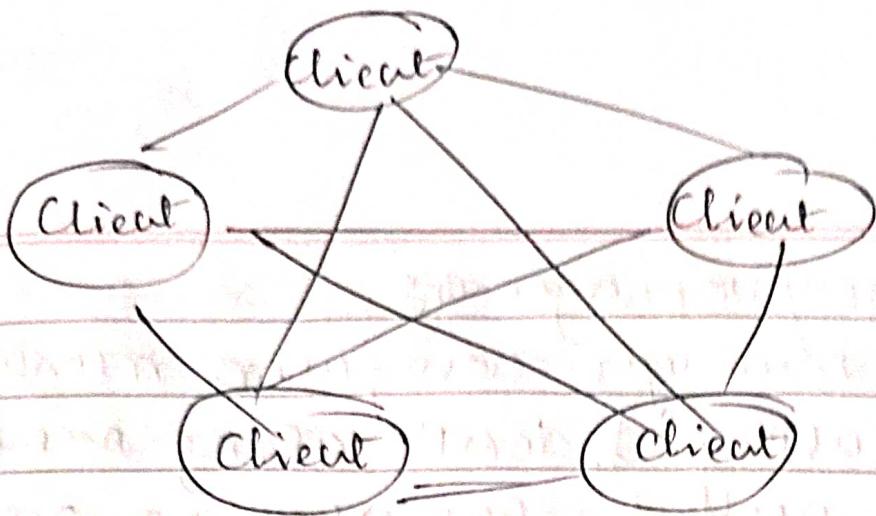
- provides a file s/m interface where clients can create, update, read & delete files.



## ② Peer - to - peer Computing

- Another structure for a distributed s/m is the peer-to-peer (P2P) s/m model.

- In this model, clients & servers are not distinguished from one another.



## (ii) Operating Systm.

An operating system is a program that manages a computer's hardware. It also provides a basis for application programs.

primary purposes of O.S.

### → ① Efficient Resource management

- the OS allocates & manages computer resources including memory, CPU, storage and peripherals.

### ② process management

- OS handles the creation, execution, and termination of processes.

- it ensures that multiple programs can run simultaneously without conflicts.

### ③ Memory management.

- OS manages computer's memory by allocating & deallocating memory space as needed for running programs & data storage.

### ④ Device management.

- The OS handles the communication between computer & its hardware devices.

### ⑤ User interface management.

- The OS provides a user interface, either command line (or) graphical, that allows users to interact with computer & its applications.

### ⑥ Security management.

- The OS enforces security measures to protect computer system & its data from unauthorized access.

### ⑦ File Management.

- The OS manages organization & storage retrieval of files & directories on the computer storage devices.

## ⑧ networking.

- OS enables computer to connect to networks, allowing for communication with other devices.

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### Mainframe:

Aspects.

1) Processing power.  
Scalability

- These are designed to handle massive workloads.

2) Reliability  
(Security)

high priority

### PC

(OS.)

→ Smaller workloads  
(limited scalability)

→ Balanced.

3) User  
Interface

Terminal based.

→ Graphical User  
Interface

4) Apps.

- Enterprise applications

→ web browsing -  
multimedia

5) cost.

→ Expensive

→ Affordable.

- ⑥ - an operating sys plays a crucial role in program execution.  
- it provides services that enables programs to run smoothly & efficiently.  
- These services can be broadly categorized.

① Program loading & execution.

- the OS is responsible for loading executable programs to memory & initiates execution.
- it translates program instructions into machine readable code & allocates the necessary resources.

② Process management.

- it manages creation, scheduling, termination of processes.
- it keeps track of each process state.

③ Memory management.

- the OS allocates & dislocates memory as needed by running programs.
- it employs various memory management techniques.

## ⑥ i/o management.

- OS handles communication b/w programs & i/o devices such as keyboards, monitors,

## ⑦ Resource sharing & protection.

- OS manages sharing of resources among multiple programs, ensuring fairness & preventing conflicts.

## ⑧ Error handling

- OS detects & handles errors that occur during program execution.

## ⑨ Communication & synchronization.

- OS provides mechanisms for programs to communicate & synchronize with each other.

## ⑩ file management.

- manages organization, storage & retrieval of files.

## ⑪ Networking

- OS enables the computer to connect to networks, allowing for communication.

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## Multiprogramming

## multitasking

defn:- ① keeping multiple programs in the main memory at same time, ready for execution. ② Executing multiple tasks simultaneously on single CPU.

purpose - ① Maximize CPU utilization by keeping CPU always busy with one program. ② Enhance responsiveness

Influence ③ uses a scheduling algorithm to switch b/w programs. ③ employs time-slicing among multiple tasks.

appn:- ① Batch processing systems. ② Interactive systems.

Example ① UNIX  
MULTICS

② Macos  
Windows  
Linux.

① example of an operational environment where S/m. would have to be both. multi-programming & online s/m.

① a hospital information s/m.

② Multi programming

— The s/m. needs to be able to handle multiple concurrent tasks. such as patient tracking, medications, and management patient records.

— This requires the s/m. to be able to keep multiple programs in memory at the same time.

④ Online s/m.

— The s/m needs to be able to respond to critical requests in real time, such as monitoring patient vital signs & responding to medical emergencies.

— it means that the s/m. cannot afford to wait for batch jobs to finish before processing new requests.