

Assignment - 1.

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Q.1. Short answer question.

(1) Define Operating System.

→ Operating System is a system software that acts as an interface between user and hardware.

(2) Define Kernel.

→ Operating system is structured by removing all nonessential components from the kernel and implemented as system and user level programs.

Kernel is smaller in this approach.

(3) What is Booting.

→ The procedure of starting a computer by loading the kernel is known as booting the system.

(4) Define open source operating System.

→ An open-source operating system is the operating system in which source code is freely available, visible publicly and editable.

(5) Define Bootstrap Loader.

→ small program known as the bootstrap program or bootstrap loader allocates the kernel, loads it into main memory and starts its execution.

Q.2. Long answer question.

(1) Explain the functions of operating system.

→ Following are the main functions of the O.S:

(a) User interface :

- user interface is a platform for users and other applications running on the operating systems to communicate with each other.
- This can be of three main type -

(i) Command Interpreter

(ii) GUI (Graphical User Interface)

(iii) menu driven

(b) Resource management :

- Device connected to a computer system, such as memory, storage, I/O device etc., are called resource of the computer.
- Operating system controls these resources and detects malfunctioning of the resources.

(c) Task management :

- The task management programs of any operating system takes instructions, analyzes it and processes it.

(d) File management :

- Operating system manages file on the computer, such as creating, deleting, accessing, coping, moving, storage of files etc.

(e) Utilities :

- OS provides various utilities to the user and other programs such as defragmenting files, data compression, data backup and recovery, anti-virus utilities etc.

(2) Explain layered structure of operating system,

→ It is built upon the following layers:

→ (1) User layer (2) kernel layer

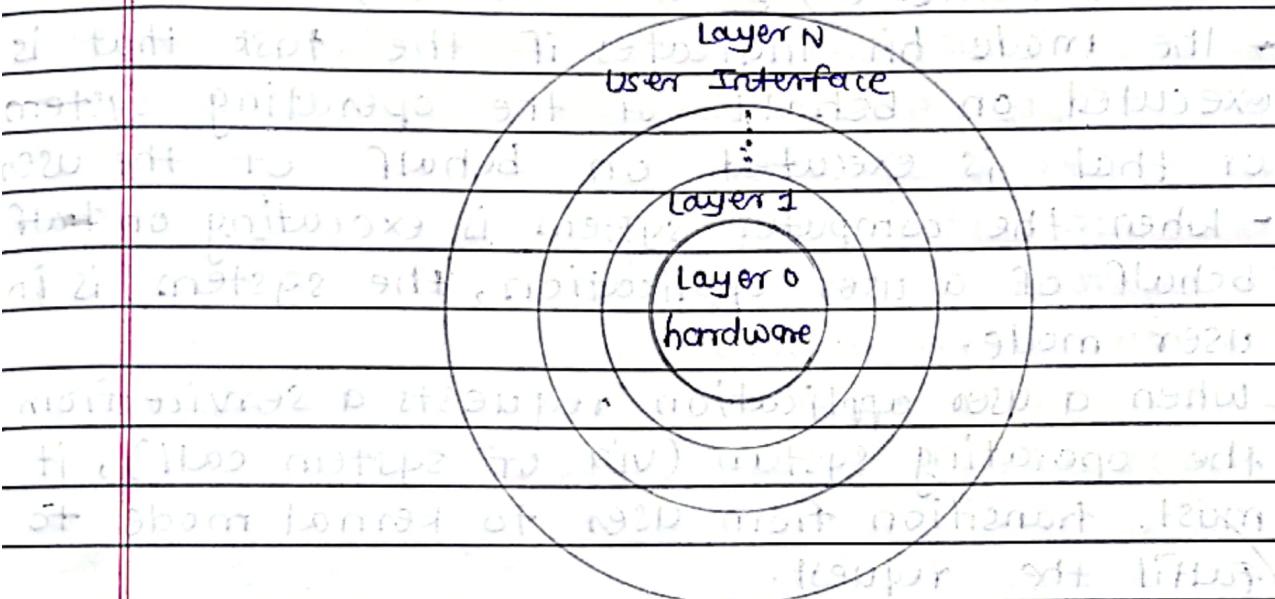


fig - Layered structure of operating system.

- The operating system can be broken into different smaller modules and can be called as layers.
- Each layer has well-defined functionalities. Layers are independent of each other.
- Layer can hide the data from other layers.
- Lowest layer i.e., layer 0 is the hardware and the highest layer is user interface.
- Higher level layer invoke operations on lower level layers.

(3) Explain the dual mode operations of operating system.

→ We need two separate modes of operation:

(a) User mode

(b) Kernel mode

(Supervisor mode, system mode, privileged mode etc also)

- To implement this approach a bit is called the mode bit is maintained in the hardware of the computer to indicate the current mode : kernel (0) or user (1).
- The mode bit indicates if the task that is executed on behalf of the operating system or that is executed on behalf of the user.
- When the computer system is executing on behalf of a user application, the system is in user mode.
- When a user application requests a service from the operating system (via of system call), it must transition from user to kernel mode to fulfil the request.

(4) Explain the distributed systems.

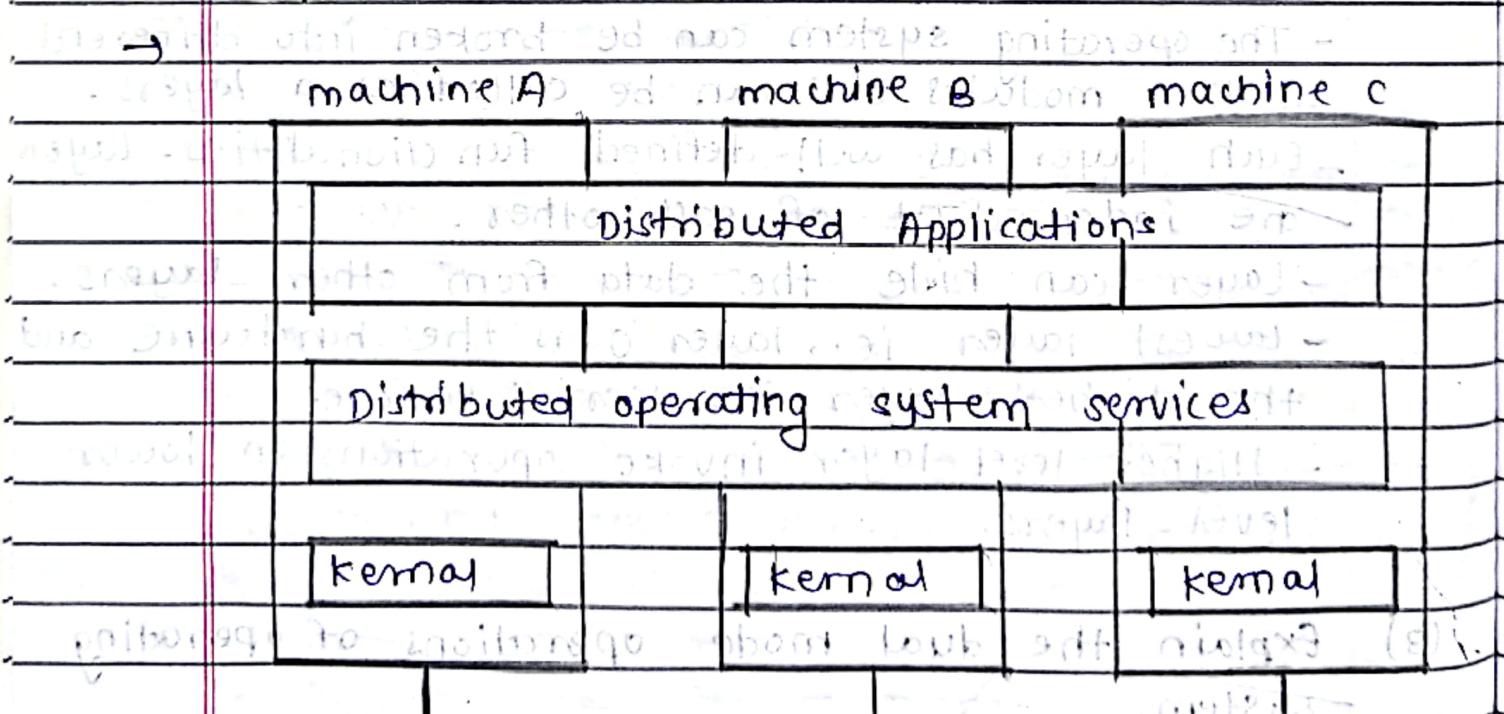


Fig - Distributed System

- A distributed system is a collection of heterogeneous, physically separate computer system that are connected to each other through network to provide the users with access to the various resources that the system maintains.
- Distributed system allows access to a shared resource which increases computation speed, functionality, data availability, and reliability.
 - The protocol that creates a distributed system can greatly affect that system's utility and popularity.
 - The distributed operating system provides a less autonomous environment.

(5) Explain the peer-to-peer computing in detail.

- The another structure for a distributed system is the peer-to-peer (P2P) system model.
- In this model, all nodes work as peers without having label as client or server.
- Peer-to-peer systems have more advantages than traditional client-server system.
- In a peer-to-peer system, services can be provided by several nodes and distributed throughout the network.
- Before providing or requesting a service, node has to join peer to peer network.
- When node joins the network, it has to register its services with centralised lookup service.
- A discovery protocol is used that allows peers to discover services provided by other peers in the network.

(6) What are the advantages and disadvantages of open source operating system.

→ - Advantages :

- (i) Cost-efficient & reliable
- (ii) Reliable and efficient
- (iii) Flexibility
- (iv) Community support
- (v) Security
- (vi) Customizability

- Disadvantages :

- (i) Security risk
- (ii) Complicated
- (iii) No support by soft. engg. with nobjx
- (iv) Hardware incompatibility
- (v) Long-term viability
- (vi) Ease to use.

(7) Explain Operating System services in detail.

- - Operating system provides services to the program and the user or the programmer.
- An operating system creates an environment for the execution of program.
- Different operating system provides different services.
- Some services are provided for the convenience of the programs.
- Some OS services provides functions that are helpful to the user :
 - (a) User Interface.

- (b) program execution
- (c) I/O operation
- (d) file-system manipulation
- (e) communications
- (f) error detection.

→ Another set of OS services exists for ensuring the efficient operation of the system itself.

- (a) Resource allocation
- (b) Accounting
- (c) protection and security

(8) Which are other types of system call?

→ The Types of system call are -

(i) process control :

- (a) end, abort
- (b) load, execute
- (c) create process, terminate
- (d) get process attribute, set process attribute
- (e) wait event, signal event.
- (f) allocate & free memory.

(ii) file management :

(a) create file, delete file

(b) open, close

(c) read, write, reposition

(d) get file attribute, set file attribute

(iii) Device management :

(a) request device, release device

(b) read, write, reposition

(c) get device attribute, set device attribute

- (d) logically attach, detach mdevice (d)
 (iv) Information maintenance & setup edit (b)
- (a) get time or date e.g. set time or date
 - (b) get system data, set system data
 - (c) get process, file or device attribute
 - (d) set process, file or device attribute.
- (v) communication & mailbox connection (a)
- (a) create, Delete, communication soft (a)
 - (b) send, Receive, message editing (b)
 - (c) transfer status information
 - (d) attach or detach remote device (c)