INTRODUCTION TO O.S

Operating System :-

* O.S is a System s/w.
* O.S is a set of program that manages the resources of the computer system such as CPU, I/O, Memory, File etc.

(H/W) :- System, Program App Program User.

Operating System Structure :-

O.S structure defines Input/Output & function of O.S.

So that Architecture is fundamental Structure of an O.S that defines the interconnection between the system component.

An O.S is designed using diff. Architectures :-
1) Layered Structure / architecture.
2) Kernel Structure / architecture.
3) Virtual Machine Architecture.
4) Client-server model architecture.

1) Layered Architecture :-

Applications /Shell
Service layer
Kernel
Hardware (H/w).
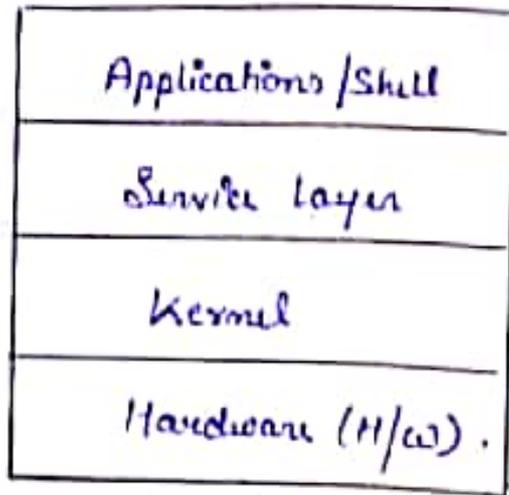
a) Layered architecture categories the O.S into diff. layers that communicate using standard function calls.

b) Each new layer is built on the top of an older layer.

c) The higher-level layers call the set of functions & data structure of lower-layer.

* Various Layers of O.S system are :-

* H/W

* Kernel

* Service layer.

* Application /Shells.

* **Hardware :-**

It acts as a platform for an O.S. It provides computing resources for executing various application programs.

* **Kernel :-**

i) Kernel is the core of all the operating systems. Kernel directly interacts with H/w & schedules the execution of various tasks.

For example :-

In a Multi-processor O.S kernel decides the processor & the program to be chosen for execution.

ii) Kernel performs low-level functions, such as - reading the input from keyboard & displaying the output on the monitor.

In addition to these low-level function, kernel also perform other imp. function such as :- Memory Management, File Management & System account of various processes.

3) Kernel is also called Real-time executive.

* Service Layer :-

- It interact with the kernel & the drivers. Service layer is responsible for maintaining security & sanity checking of user's files & object.

- It is decision making of which process for various jobs.

- For Example :-

If a program is not currently use the service layer gives the permission & informs the kernel for deleting the file.

* Applications/Shell :-

User creates diff. applications & executes these application through shell.

Shell is a utility that is stored on the Hard disk & is loaded into the Memory when the kernel is invokes.

- It acts as interface between the user & O.S.

- Shell is also known as Command line Interpreter.

2) Kernel Approach :-

Kernel is main part of O.S interact directly & make interface for the H/w of computer system.

__Main function of Kernel are :-__

* Provide Mechanism for creating & deleting process.
* Provide CPU scheduling, memory management & I/o Management.
* Provide mechanisms for process synchronization.
* Provide mechanisms for Inter-process communication.
* Unix is based on kernel approach.
* Kernel is between system program & H/w.
* It supports file management, process scheduling, Memory Management, & other O.S function within

the help of system call.

* Unix O.S support a large no. of system call for the process management & other O.S function with these system calls application program utilities the resources of O.S.

3) Virtual Machine (or)

Every Virtual Machine makes it as a real machine.

This type of working is like as single tele- phone line on which many conversion are going on without any interference.

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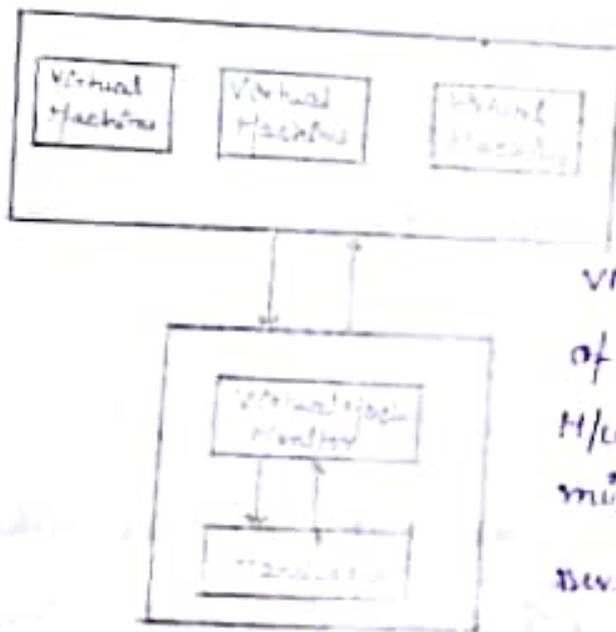
VMM is the main part of VM which runs on the H/w & does multiprogram- ming, providing not only by several VM to the next level.

(Virtual Machine Architecture).

1) Virtual Machine Architecture are based on the principle of creating duplicate copies of O.S.

2) These copies are concurrently executed on the same H/w platform.

3) Virtual Machine uses the concept of CPU scheduling & Virtual Memory for creating a false impression on Multi-processor.

Thus, each processor executed concurrently in their Virtual instruction.

4) Virtual Machine works like an actual physical computer. 5) It is used in various concept, such as :- Partitioning the H/w & sharing it among diff. program.

6) Creating the portable s/w & executing older version of s/w on computer & with latest configuration.

7) → Virtual Machine Contain a s/w layer called VMM (Virtual Machine Monitor) that creates the exact copies of H/w resources & exact copies.

Ex:-

VM/370 in example of Virtual Machine. The advantage of using virtual architecture is that it facilitates the sharing of H/w resources.

The disadvantage of using Virtual Machine is that Virtual - Machine s/w requires a lot of disk space for providing virtual memory.

4) ## Client - Server Architecture :-

It consists of two different computer program → Client & Server. Client sends a service request to server for accessing various resources.

The Server fulfills the request by providing shared access to resources such as:-

Printer, Modem & Database.

Client-Server architecture is mainly used in a N/w for efficient distribution of resources across different client.

The component of Client - Server are :-

* Client.

* Network. (N/w)

* Server.

Client contains component such as :- GUI, DBMS communicating package & O.S is used for communicating with the server database.

N/w is used for communicating the clients with the server. A N/w can be LAN, WAN, Internet etc.

Server contain various component such as -
N/w communication, authentication module database pack & O.S.
Authentication module verifies various client for their verification using password.
Database package contains various protocol for accessing the database that includes protecting the information from user by revoking permission for

reading & writing of record.