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## 1.4 Operating system structure-monolithic layered

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The mean of operating system architecture usually follows the leave-taking of particular principle. Such principle guide to re-structure the operating system mainly into relatively independent parts that can be easily provide basic independent features by keeping complicated designs in manageable conditions.

Apart from controlling complexity, the architecture of operating system influences key features that are in terms of robustness or efficiency as:

- The OS receives importance which allows to work if not then protected resources like physical devices or application memory. With such importance, the various related parts of OS or OS as a whole will be both accidental and malicious privileges misuse gets lowered.
- By breaking OS into different parts will led to adverse effect on efficiency since the overhead linked with communication among individual parts be exacerbated when coupled with hardware mechanisms?

### Monolithic Systems

Aboriginal concept of the operating system arrangement brings about no definite accommodation for the discriminating nature of the operating system. Furthermore the concept follows the separation of concerns; no action is acted to limit the blessings granted to the single parts of the operating system. The complete operating system acts with maximum approvals. The communication overhead inside the basic operating system is the identical as the communication overhead inside numerous other software, considered relatively low.

It is seen that CP/M and DOS are examples of monolithic operating systems that share common address space with certain applications. It is found in CP/M, 16 bit address space will begins with system variables along with application area additionally ends with 3 parts of O/S which are known as:

- CCP or Console Command Processor
- BDOS or Basic Disk Operating System
- BIOS or Basic Input/output System

If we see that in a DOS Operating System, there exists a 20 bit address space that begins with an array of interrupt vectors along with system variables that are followed by local DOS and its application area which will end with memory block utilised by video card and BIOS as shown in fig 1.4.

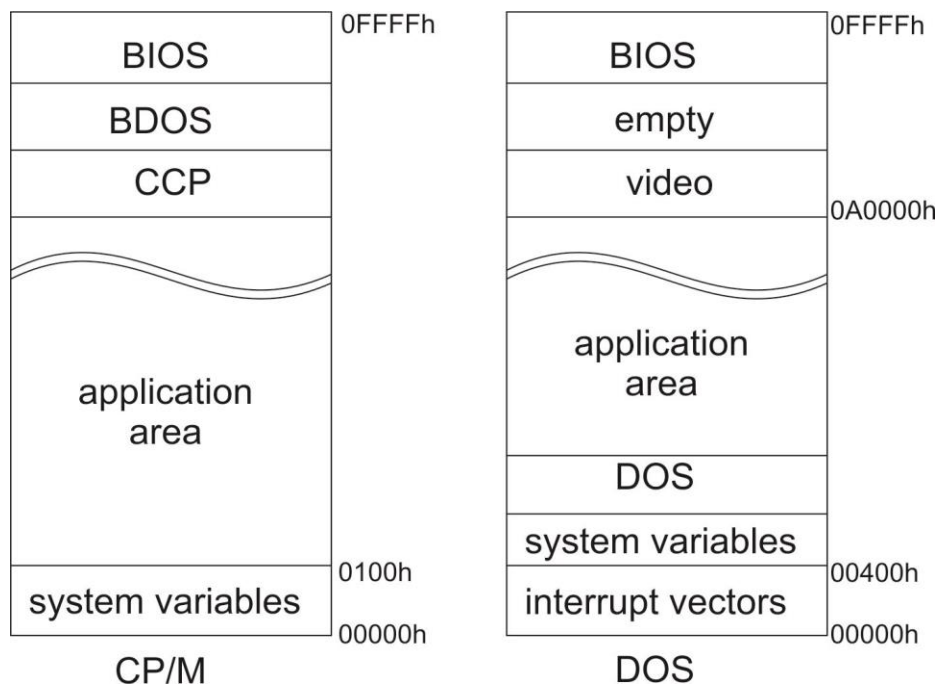


Fig 1.4: Monolithic Operating Systems

**Check your progress 3**

1. Which is not a part of Operating System?

- a. CCP
- b. BDOS
- c. BIOS
- d. DOS

**1.5 Virtual machine and Client server**

**Virtual machine**

A virtual machine (VM) abides an operating system OS or conduct environment that is embedded on software which copies consecrated hardware. The end user embraces the equivalent experience on a virtual machine as they would acquire on dedicated hardware.

Individualized software designated a hypervisor copies the PC client or server’s CPU, memory, hard disk and network as well as other hardware resources collectively, allowing virtual appliances to participate the resources. The hypervisor can copy integral virtual hardware platforms that are occasional from each other, assigning virtual machines to run Linux as well as Windows server operating systems on the identical underlying physical aggregation. Virtualization conserves costs by depreciating the need for physical hardware systems. Virtual machines additional desirably use hardware, which lowers the quantities of

hardware as well as associated maintenance costs, along with reduces power furthermore cooling demand. They also allay management due to virtual hardware does not collapse. Administrators can take advantage of virtual circumstances to simplify backups, disaster recovery, new deployments as well as elementary system administration tasks.

Virtual machines do not constrain distinguished hypervisor-specific hardware. Virtualization appears although require more bandwidth, storage along with processing capacity than a conventional server or desktop if the physical hardware is going to host multiple running virtual machines. VMs can easily move, be copied and reassigned between host servers to optimize hardware resource utilization. Because VMs on a physical host can consume unequal resource quantities (one may hog the available physical storage while another stores little), IT professionals must balance VMs with available resources.

### **Client server**

Client/server is a program relationship in which one program (the client) requests a service or resource from another program (the server).

It is seen that in client/server model, the programs are used by single computer only. It serves as an important concept for networking. Here, the client makes a connection with the server through local area network (LAN) or wide-area network (WAN) like Internet. After clearing the client's request, the connection gets terminated. In this case the Web browser serves as a client program which further appeals for a service from the server. The service and resource of the server will show the delivery of such Web page.

Computer assignments in which the server accomplishes a request created by a client are very customary furthermore the client/server model has served one of the main concepts of network computing. Most business approaches facilitate the client/server model as appears acts the Internet's core program, TCP/IP. For exemplary, when you examine your bank account from your computer, a client approximation in your computer overtures a request to a server program at the bank. That program may in twist forward an approach to its own client program, which that time conveys, a request to a database server at another bank computer. Once your account balance sheet has been acquired from the database, it is acknowledged back to the bank data client, which in turn applies it back to the client in your personal computer, which that time displays the information to you.

Both client programs as well as server programs are usual constituent of a larger program or application. On account of multiple client programs participate

the services of the equivalent server program, a special server identified a daemon may be charged due to anticipate client requests. In marketing, the client/server had been once used to differentiate allocated computing by personal computers (PCs) from the monolithic, concentrated computing model exercised by mainframes. This differentiation has largely evaporated, although, as mainframes along with their applications possess additionally turned to the client/server model further become part of network computing.

### **Check your progress 4**

1. Virtual machine can run:
  - a. Windows
  - b. Linux
  - c. DOS
  - d. all
2. In a Client/server program:
  - a. one program requests a service from another program
  - b. one program requests a copy to another program
  - c. one program requests a hardware to run another program
  - d. one program requests a software to load operating system

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## **1.6 Let Us Sum Up**

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### **In this unit, we have learned:**

- That an operating system or OS is software program that enables the computer hardware to communicate and operate with the computer software.
- We see that there are many functions of an operating system which will help in managing:
  1. Processor.
  2. Random Access Memory:
  3. Input/output
  4. Execution of applications