

OPERATING SYSTEM STRUCTURE - II

Operating System Structure:

The structure of an operating system is dictated by the model employed in building them. An operating system model is a broad framework that unifies the many features and services the operating system provides and tasks it performs. Operating systems are broadly classified into following categories, based on the their structuring mechanism as follows:

- c. Virtual Machine
- d. Exokernels
- e. Client-Server Model

Virtual Machines:

Virtual machine approach provides an interface that is identical to the underlying bare hardware. Each process is provided with a (virtual) copy of the underlying computer as shown in the fig. The resources of the physical computer are shared to create the virtual machine. CPU scheduling can be used to share the CPU and to create the appearance that users have their own processors.

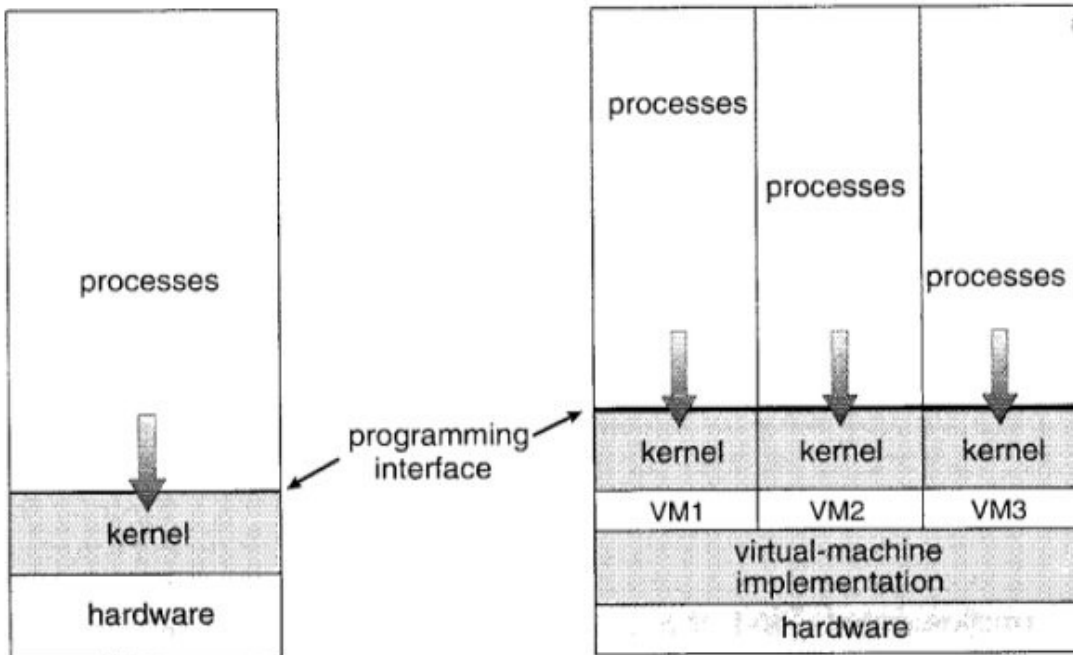


Fig: a). Non Virtual Machine

b). Virtual Machine.

Although the virtual machine concept is useful, it is difficult to implement. Much effort is required to provide an exact duplicate of the underlying machine.

Example. Java

Client-Server or Microkernel

The advent of new concepts in operating system design, microkernel, is aimed at migrating traditional services of an operating system out of the monolithic kernel into the user-level process. The idea is to divide the operating system into several processes, each of which implements a single set of services - for example, I/O servers, memory server, process server, threads interface system. Each server runs in user mode, provides services to the requested client. The client, which can be either another operating system component or application program, requests a service by sending a message to the server. An OS kernel (or microkernel) running in kernel mode delivers the message to the appropriate server; the server performs the operation; and microkernel delivers the results to the client in another message, as illustrated in Figure.

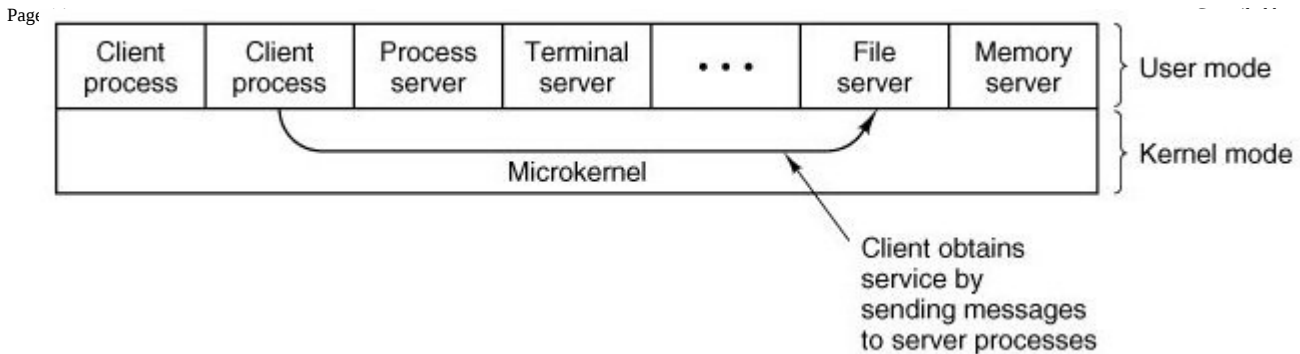


Fig: The client-server model.

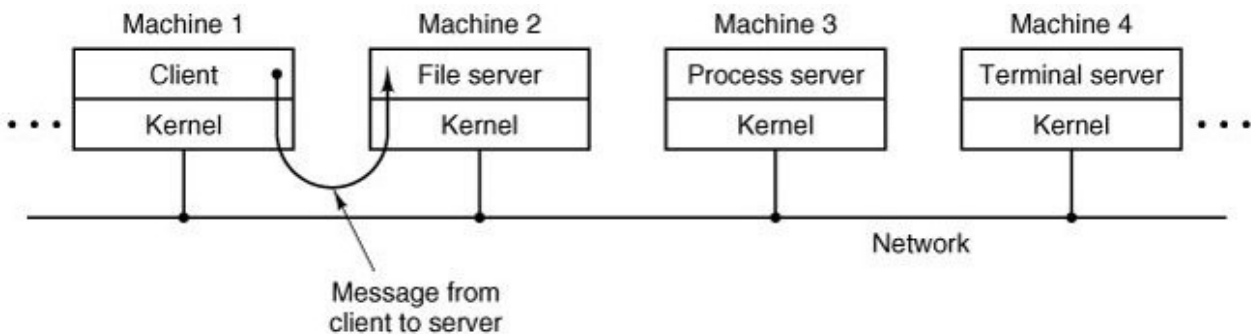


Fig: The client-server model in a distributed system.