

B. E.

Eighth Semester Examination, May-2006

DISTRIBUTED SYSTEM

Note : Attempt any five questions.

Q. 1. Discuss how remote procedure calls are implemented in DCE.

Ans. DCE is based on client/sever model client make request for services to the sever by RPC-Remote Procedure Call.

It is upto the RPC system to hide all the details from the clients, and to some extent from the sever as well. To start with, RPC system can automatically locate the correct sever of find to it, without the client having to aware part this is occurring. It can also handle the message transport in with directions, frequenting & remember them as needed.

Finally the RPC system can automatically handle locate the can sever and find to it.

As a consequence of the RPC system's ability to hide the details, clients & severs are highly independent of are another. A client can be written in C, and a sever in FORTRAN or vice-versa. A client & platforms & use different operating often. A variety of H/w protocol & data reference are also supported, all without any intervention from the client or sever the DCE RPC consists of a No. of components, including languages, libraries, dolmans, & utility programs, among others. Together these make it possible to write clients & severs.

In client/sever systems the give that holds everything together is the I/F definition. This is effectively a contact between the sever & its clients, specifying the services that the sever is offering to the clients.

The concrete representation of this contract is a file, the I/F definition file, which lists all the procedure that the sever allows its clients to invoke servility.

Q. 2. What is asynchronous transfer mode? Discuss the ATM referenced model in detail.

Ans. A hybrid form using fixed size blocks over virtual circuits was chosen as a compromise that gave reasonably good performance for both types of traffic. This scheme called ATM-Asynchronous Transfer Made. If has become an international standard, which play an important role in future distributed systems, both local-area ones & wide-area ones.

The ATM Model is that a sender be establishes a connection to the receiver or receivers. During connection establishment a route is determined firm. The sender to receiver and routing information shared in the switches.

Using above connection, packets can be sent, but they are chapped up in small fixed unit cells called CELLS, when connection NO longer needed, it is released & the routing information plunged from the switches.

Q. 3. (a) What are deadlocks? How are deadlocks prevented in distributed systems? Illustrate.

Ans. Deadlock : It is a situation where in two or more competing actions are waiting for the offer to finish, and thus neither ever does. It is often seen in a parady file either the chicken or the egg.

Deadlock prevention :

1. Removing the mutual exclusion conditions means that no process may have exclusive access to a resource.
2. Algo, used like non backing synchronization.
3. Hold & wait conditions removed by requiring.

Q. 3. (b) Compare Election algorithm and Bully algorithm.

Ans.

Election	Bulley
<p>In this one process has to act as coordination initiator, sequences or otherwise perform same special role.</p> <p>An election has to be preferred, for choosing a coordinator.</p> <p>It all processes are exactly the same with no distinguishing characters there is no way to select one of them to be special.</p>	<p>When a process notices that the coordinator is no larger responding to requests, it initiates and elections.</p> <p>A process P holds an election as follows :</p> <ul style="list-style-type: none">• P sends an Electron message to all processes with higher Nos.• If no one responds, P wires the election and become conditions.• It one of higher-ups answer, it take over. P's jobs is done.

Q. 4. Explain the following :

(a) Mutual Exclusion

(b) MACH process management :

Ans. (a) Mutual exclusion : System involving multiple processes are often most easily programmed using critical regions. When a process has to read or update certain shared data structures, it first enters a critical region to achieve mutual exclusion and ensure that no other process will use the shared data structure at the same time. In single processor system critical regions are protected using semaphases, monitors and similar constructs.

(b) MACH process management : Process management in Mach deal with processes, threads, and scheduling.

A process in Mach consists primarily of an address space & a collection of threads that execute in that address space. Processes are passive execution is associated with the threads. Pressing are used for collecting all the resources related to a group of cooperating threads into convenient containers.

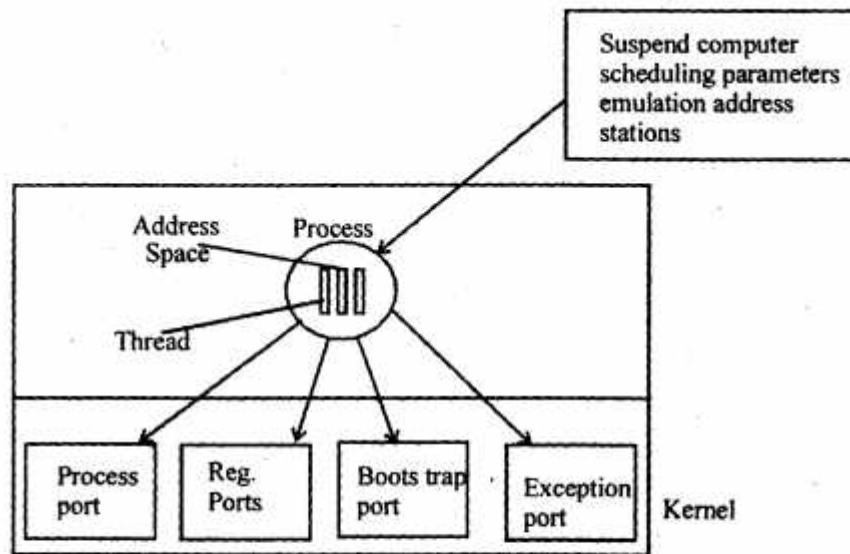


Fig. show a Mach process

Q. 5. What is distributed file system? What makes it different from conventional file systems? Illustrate the emerging trends in distributed file systems.

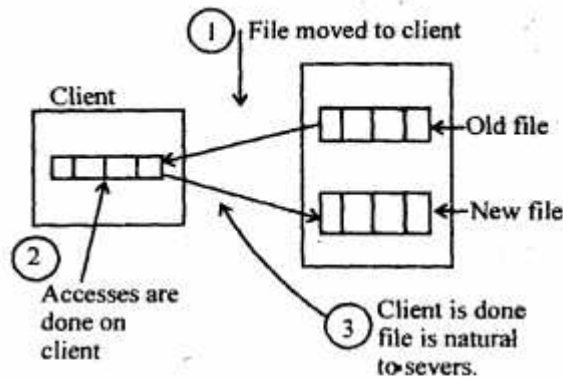
Ans. Distributed file system : A dFS typically has two reasonably distinct components :

- (i) TRUE FILE SERVICE
- (ii) DIRECTORY SERVICE

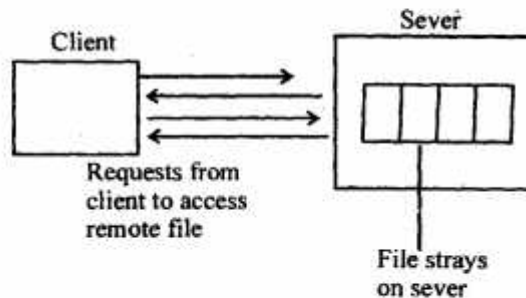
The former is concerned with the open on individual files such as reading writing and appending, whereas the latter is concerned with creating & managing directories, adding & deleting files from directories and so on. For any file source, whether for a single processor or a distributed system, the most fundamental issue is what is a file? In many systems such as UNIX & MS-DOS, a file is an uninterpreted sequence of bytes. The meaning & structure of the information in the files is entirely upto application programs.

All file services are split into two types :

- 1. In upload/download model.
- 2. In remote access model.



Second model is remote access model.



Q. 6. Explain the following :

(a) Fault-tolerance distributed systems

(b) DCE threads.

Ans. Explain Following :

(a) Fault-to-balance distributed systems : A system is said to find when it does not meet its specification. In some cause, such as supermarket's distributed O.s, a failure may result is some store running out of

connect beams. In other cases, such as in a distributed air traffic control system, a failure may be catastrophic. As computers & distributed systems become widely used in safety-critical missions.

(b) **DCE threads** : DCE thread package, along with the RPC package is one of the fundamental building blocks of DCE. The DCE thread package is based on P1003.4a POSIX standard. It is a collection of user-level library procedures that allow processes to create, delete & manipulate threads.

Q. 7. (a) How scheduling is achieved in distributed systems? Illustrate.

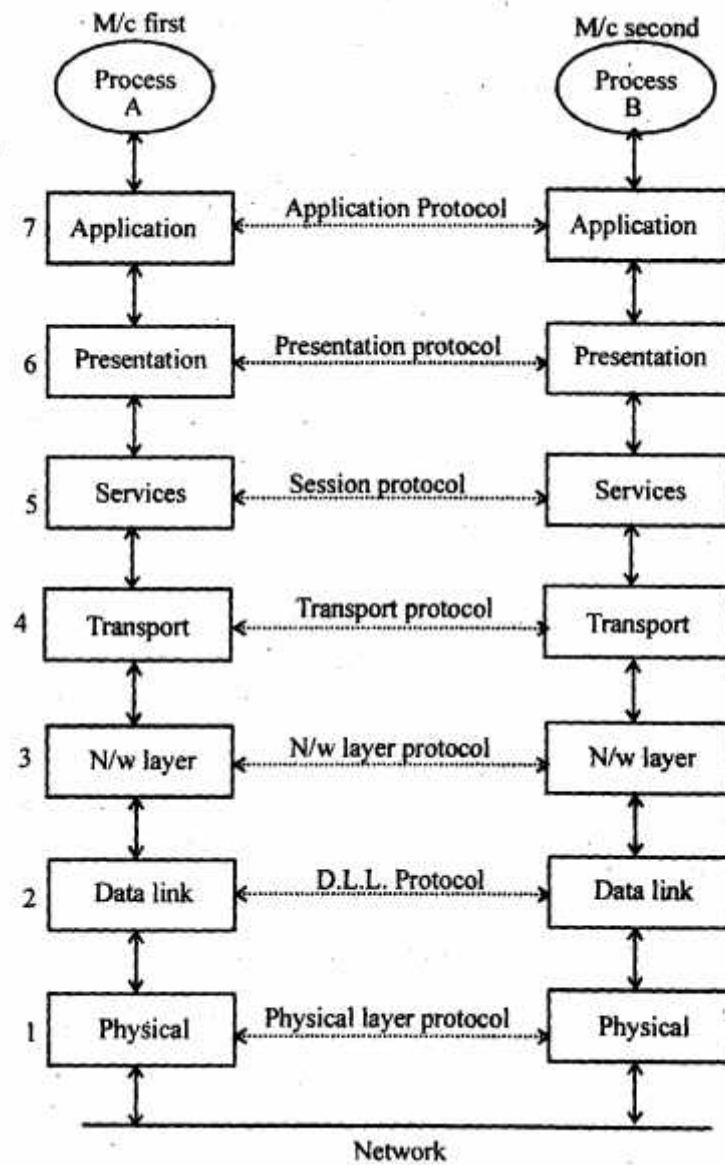
Ans. Scheduling in distributed systems : There is not really a lot of say about scheduling in distributed system. Normally each processor does its run scheduling without regard to what the other processors are doing. Usually this approach works fine, however when a group of related, heavily interacting processes are all running on different processors, independent scheduling is not always the most efficient way.

Time slot	Processor		Processor							
	0	1	0	1	2	3	4	5	6	7
0	A	C	x				x			
1	B	D			x			x		
2	A	C		x			x		x	
3	B	D	x					x		
4	A	C		x						x
5	B	D			x		x			

Allocate flats share by X

Q. 7. (b) What are layered protocols in distributed systems? Outline the purpose of each of these protocols.

Ans. Layered protocols in distributed systems : In layered protocols in the distributed system, we discuss about OSI model. Which is given below :

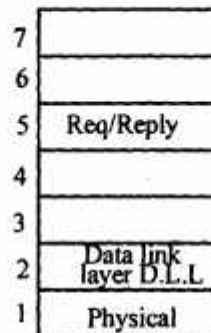
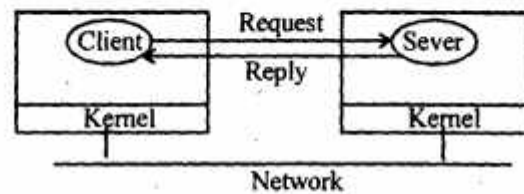


Q. 8. Explain the following :

(a) Client-server model

(b) Page-based distributed shared memory.

Ans. (a) Client-Server model :



The idea behind this model is to structure the O.S as a group of co-operating processes are called sever, that offers services to the users called CLIENT.

(b) Page-based distributed shared memory : These system are built on top of multicomputers, that is processors connected by a specialized message passing network, workstations on a LAN or similar designs. The essential element here is that no processor can directly access any other processor's memory. Such systems are sometimes called NORMA (NO Remote Memory Itcers) system.