# CASE STUDY NO : 13

Aim : Study of various Amoeba server.

## The Bullet Server -

- Designed to run on machines with large amounts of RAM and huge local disks.
- Used for file storage.
- Client process creates a file using the create call.
- Bullet server returns a capability that can be used to read the file with.
- Files are immutable and file size is known as file creation time. Contiguous allocation policies used.
- Handles file storage.
- Choice of file system is not dictated by operating system.
- The file system runs as a collection of server processes.
- The bullet server was designed to be very fast.
- Files are immutable: Once a file has been created, it cannot subsequently be changed.

## The Run Server -

- Used for fault tolerance and performance.
- When user types a command, two decisions have to be made. On which architecture should be the process be run?
- Run server manages the processor pools.
- Uses processes process descriptor to identify

appropriate target architecture.

- Checks which of the available processors have sufficient memory to run the process.
- Estimates which of the remaining processor has the most available compute power.
- The run server helps make decisions on.
  - On what architecture type.
  - which processor should be chosen.
- Each run server manages one or more processor pools.
- First the intersection of the process description and pool processors is ~~compound~~. computed.

The Directory Server -

- Used for file server.
- Maps from ASCII names to capabilities.
- Directories also protected by capabilites.
- Directory server can be used to name, ANY object, not just files and directories.
- Handles the naming of files and other objects.
- Primary function is to provide a mapping from human-readable (ASCII) names to capabilities.
- Directories are not immutable.
- Some of the directories in each user's root are similar to those in UNIX, such as bin, dev and etc.
- Public, which contains the start of the shared public tree.

The TCP/IP server

- A TCP/IP server has been provided to communicate with x terminals, to send and receive mail to non-Amoeba machines and to interact with other. Amoeba systems via the Internet.
- To establish a connection, an Amoeba process does an RPC with the TCP/IP server giving it a TCP/IP address.
- The caller is then blocked until the connection has been established or refused.
- In the reply, the TCP/IP server provided a capability for using the connection. Although Amoeba uses the FLIP protocol internally to achieve high performance, sometimes it is necessary to speak sometimes it is necessary to speak TCP/IP, Subsequent RPCs can send ~~and~~ and receive packets from the remote machine without the Amoeba process having to know that TCP/IP is being used.

The Boot Server -

- Provides a degree of fault tolerance.
- Ensures that servers are up and running.
- If it discovers that a server has crashed, it attempts to restart it, otherwise selects another processor to provide the service.
- Boot server can be replicated to guard against its own failure.

- A server that is interested in surviving crashes can be included in the boot server's configuration file.
- Each entry tells how often the boot server should be poll and how it should poll.
- The boot server can itself be replicated, to guard against its own failure.

## The Replication server -

- Used for fault tolerance and performance.
- Replication server creates copies of files, when it has time.
- Objects managed by the directory server can be replicated automatically by using the replication server.
- lazy replication
  - When a file or other object is created, initially ~~at~~ only one copy is made.
  - replication server can be invoked to produce identical replics, when it has time.
- It works best for immutable objects, such as bulled files.
- Immutable objects cannot change during the replication process, so it can be safely go in the background, even if it takes a substantial time.
- Runs the again and garbage collection machanism used by the bullet server and other servers.

Other Server -

Amoeba supports various other servers. These include a disk server (used by the directory Server for storing its arrays of capability pairs) Various other I/O servers, a time-of-day server, and a random number server (useful for generating ports, capabilities, and FLIP addresses). The so-called swiss Army knife server deals with many activities that have to be done later by starting up processes as a specified time in the future. Mail servers deal with incoming and outgoing electronic mail.