CANADIAN COLLEGE OF MODERN TECHNOLOGY

1 SILICON HILL

MILE 91

ASSIGNMENT ONE

NAME: HENRY MARRAH

ID NO: 19290308

DEPARTMENT: COMPUTER SCIENCE

LEVEL: YEAR THREE, SEMESTER ONE

MODULE: OPERATING SYSTEM

LECTURER: MR FODAY KAMARA

DATE OF SUBMISSION: 3RD MARCH, 2021.

Q1. Write short note on the various types of operating system

Answer

**The various types of operating system are as follows:**

1. Distributed Operating System
2. Simple Batch System
3. Network operating system
4. Real-time Operating System
5. Multiprocessor System and
6. Embedded Operating System etc.

1. **Distributed Operating System:** A distributed operating system manages a group of independent computers and makes them appear to be a single computer. This systems use multiple central processors to serve multiple real time application and multiple users. Data processing jobs are distributed among the processors accordingly to which one can perform each job most efficiently.

Types of Distributed Operating Systems

1. Client-Server Systems

2. Peer-to-Peer Systems

1. **Client-Server Systems:** This is a centralize **systems** that act as server systems to satisfy requests generated by client systems. The general structure of a client-server system is depicted in the figure below:
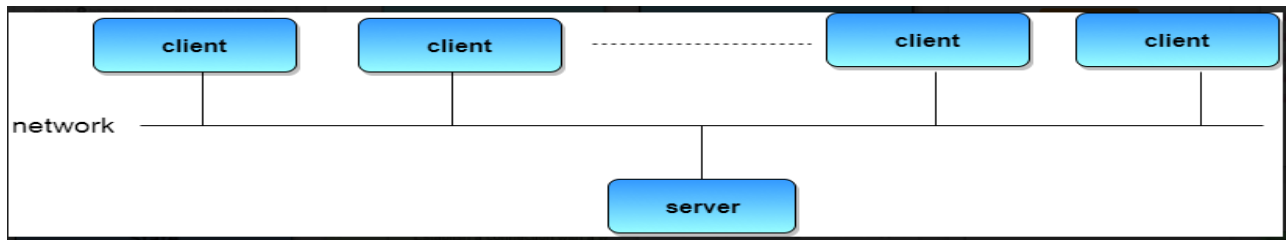
Systems can be broadly categorized as: **Compute Servers** and **File Servers**.

> **Compute Server systems**: This provide an interface to which clients can send requests to perform an action, in response Server to which they execute the action and send back results to the client.

> **File Server systems**: This provides a file-system interface where clients can create, update, read, and delete files.

2. **Peer-to-Peer Systems**: In contrast to the Tightly Coupled systems, the computer networks used in these applications consist of a collection of processors that do not share memory or a clock. Instead, each processor has its own local memory. The processors communicate with one another through various communication lines, such as high-speed buses or telephone lines. These systems are usually referred to as loosely coupled systems (or distributed systems). The general structure of a client-server system is depicted in the figure below:
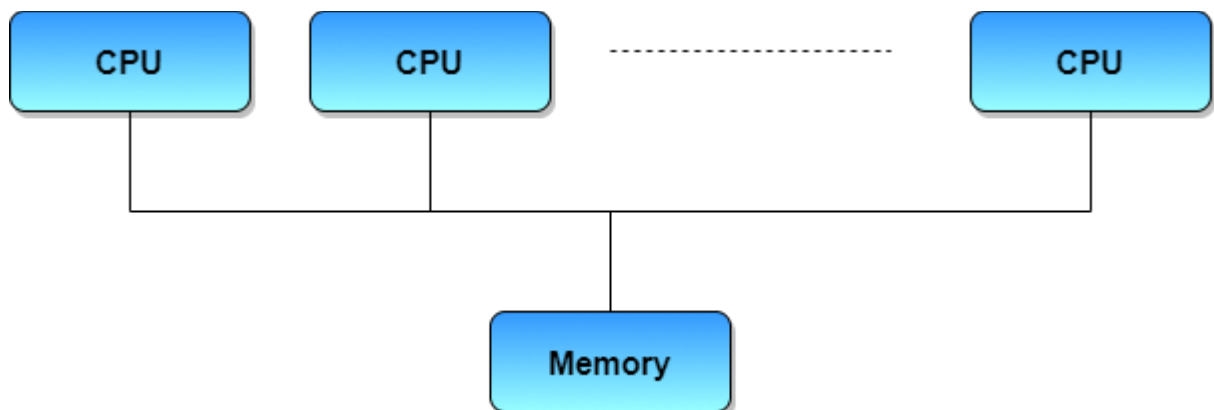
Advantages

➢ Better service to the customers.

➢ Reduction of the load on the host computer.

➢ Reduction of delays in data processing

Disadvantages

➢ Since the data is shared among all the computers, so to make the data secure and accessible to few computers, you need to put some extra efforts.

➢ If there is a problem in the communication network then the whole communication will be broken.

2. Batch operating system: The users of batch operating system do not interact with the computer directly. Each user prepares his job on an offline device like punch cards and submits it to the computer operator. To speed up processing, jobs with similar needs are batched together and run as a group. Thus, the programmers left their programs with the operator. The operator then sorts programs into batches with similar requirements.

Advantages

➢ No interaction between user and computer.

➢ No mechanism to prioritise the processes.

Disadvantages

➢ Batch systems are hard to debug

➢ It is sometimes costly

3. **Network Operating System**: Network Operating System runs on a server and provides server the capability to manage data, users, groups, security, applications, and other networking functions. The primary purpose of the network operating system is to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), and a private network or to other networks.

Advantages

➢ Centralized servers are highly stable

➢ Remote access to servers is possible from different locations and types of systems.

Disadvantage

➢ High cost of buying and running a server.

➢ Dependency on a central location for most operations.

4. Real Time operating System: Real time system is defines as a data processing system in which the time interval required to process and respond to inputs is so small that it controls the environment. Real time processing is always on line whereas on line system need not be real time. The time taken by the system to respond to an input and display of required updated information is termed as response time. So in this method response time is very less as compared to the online processing.

There are two types of real-time operating systems.

1. **Hard real- Time systems**: Hard real-time systems guarantee that critical tasks complete on time. In hard real-time systems secondary storage is limited or

missing with data stored in ROM. In these systems virtual memory is almost never found.

2. **Soft real-Time systems**: Soft real time systems are less restrictive. Critical real-time task gets priority over other tasks and retains the priority until it completes. Soft real-time systems have limited utility than hard real-time systems.

Advantages

➢ Each task gets an equal opportunity
➢ Fewer chances of duplication of software

Disadvantages

➢ One must have to take care of the security and integrity of user programs and data
➢ Data communication problem

5. **Multiprocessor System:** A Multiprocessor system consists of several processors that share a common physical memory. Multiprocessor system provides higher computing power and speed. In multiprocessor system all processors operate under single operating system. Multiplicity of the processors and how they do act together are transparent to the others.

Advantages

➢ Execution of several tasks by different processors concurrently, increases the system's throughput without speeding up the execution of a single task.
➢ It enhanced performance

Disadvantage

➢ It is very expensive

➢ As multiple processors are communicating with each other so the operating system implementation is complex to handle.

6**. Embedded Operating System:** An embedded Operating System is designed to perform a specific task for a particular device which is not a computer. For example, the software used in elevators is dedicated to the working of elevators only and nothing else. So, this can be an example of Embedded Operating System. The Embedded Operating System allows the access of device hardware to the software that is running on the top of the Operating System.

Advantages

➢ These consume less memory and other resources.

➢ Low cost.

Disadvantages

➢ Only one job can be performed.

➢ It is difficult to upgrade or is nearly scalable

References

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