UNIVERSITY OF GUJRAT

(UOG)

ASSIGNMENT NO: 01

Course Title: Parallel & Distributed Computing

Course Code: CS-424

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Q1. What is multiprocessor? Differentiate between multiprocessor and multicomputer.

There are more than on processor present in the system which can execute more than one process at the same time.
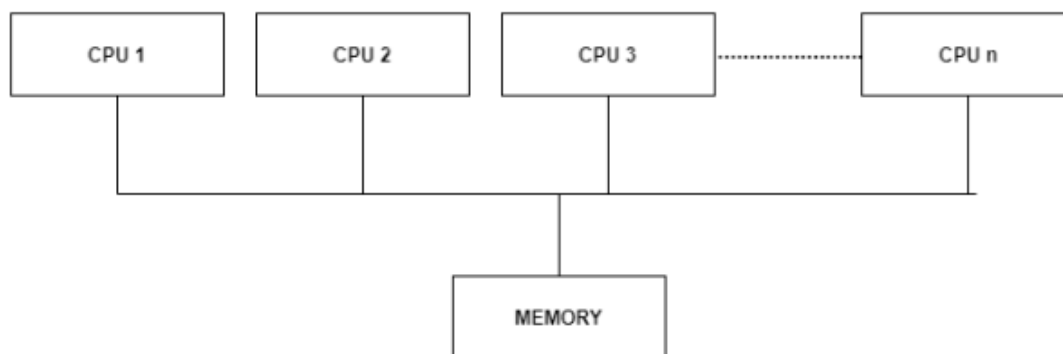
A **multiprocessor** is a computer system containing two or more central processing units (CPUs) that share resources like memory and buses. These processors work together to execute tasks simultaneously, which improves speed and performance.

Multiprocessor can be divided into independent task

- By Manually
- By programmer
- By Complier

Example: Multi-core processors, Supercomputers, Medical Imaging, Large Databases, Scientific Simulations

Uses: In banking systems, scientific simulations, cloud servers, and real-time applications where fast processing is required.
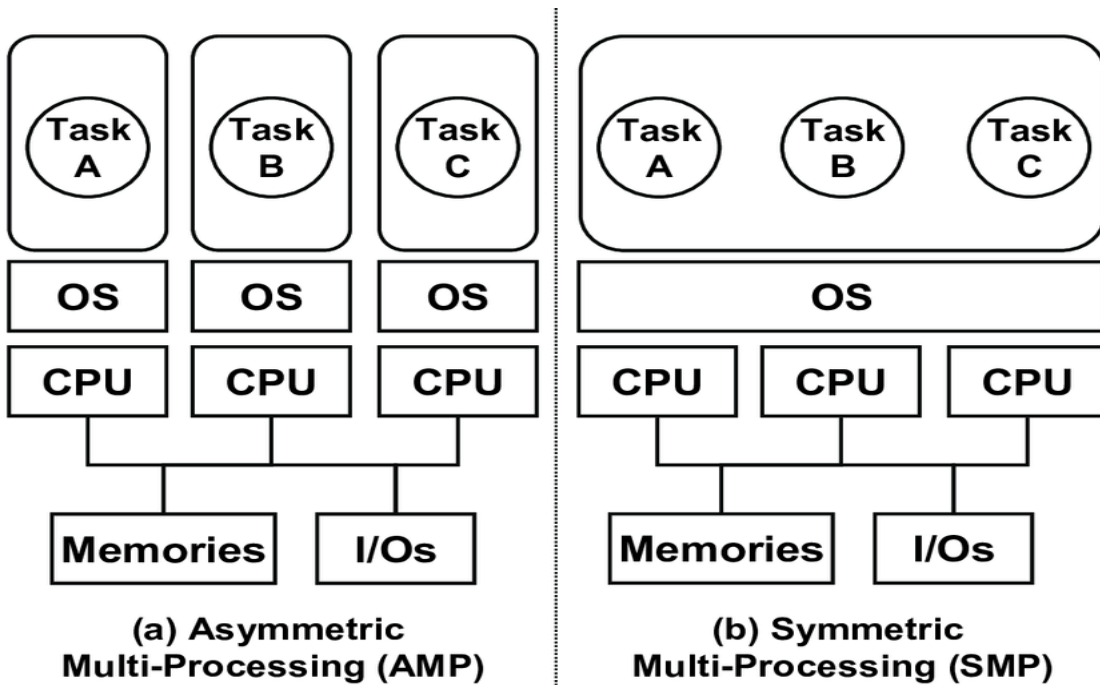

Multiprocessing Architecture

Types of Multiprocessors

1) Asymmetric Multiprocessors

There is a master processor that gives instruction to all the other processor. It contains master-slave relationship.

2) Symmetric Multiprocessors

One OS control all CPU, each CPU has equal right. All the CPU are peer to peer relationship.

(a) Asymmetric Multi-Processing (AMP)

(b) Symmetric Multi-Processing (SMP)

Advantages

- Max throughput
- More Reliable system
- Fast Processing
- Efficiency improved
- More Economic system

Dis-Advantages

- More Costly
- Complicated
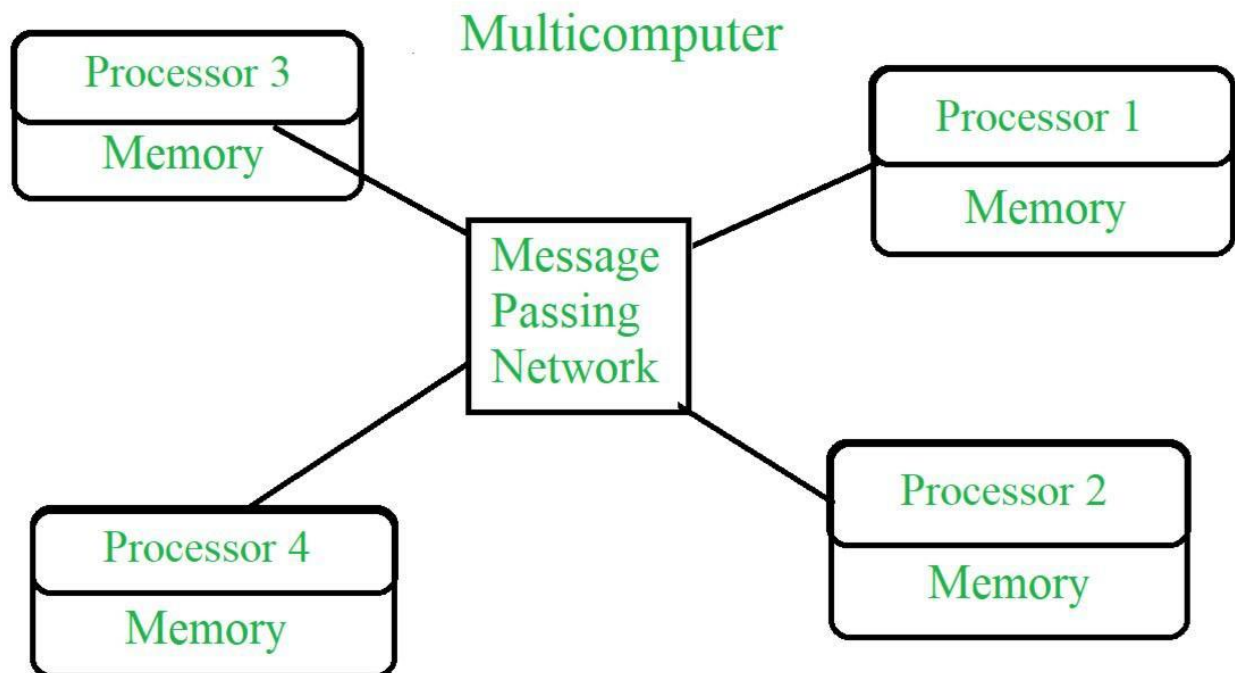- Large main memory required

Multicomputer

A **multicomputer** is a system made up of **multiple independent computers** connected through a **network**.

- Each computer has its **own private memory and I/O devices**.
- They communicate through **message passing** instead of shared memory.

Example: Distributed systems, computer clusters, and networks like the Internet.

Uses : Cloud Computing Platforms, Search Engines & Web Services, Big Data & AI, Real-Time Communication

Advantages

- Cost Effective
- Scalability
- Reliability / Fault Tolerance
- Resource Sharing
- Parallel Processing
- Geographical Distribution

Disadvantages

- Complex Network Management
- Security Issues
- Software Complexity
- Latency
- Data Consistency Issues
- Maintenance Cost

Difference

Aspect	Multiprocessor	Multicomputer
System Type	Single computer with multiple CPUs	Collection of independent computers
Architecture	Processors are connected and share memory	Each node has its own memory and is connected by a network
Resource Sharing	All processors share common memory and I/O	No shared memory, only message passing
Communication Method	Shared memory communication	Network-based communication
Cost	Expensive hardware setup	Relatively cheaper (uses normal computers)
Examples	Multi-core processors in servers	Distributed systems, Grid computing