College: J D Women's College	**Subject**: Operating System
Dept: BCA	**Unit/Topic**: Multiprocessing OS
Year: 1st	**Faculty Member**: Kundan Kumar Gautam

Notes on Lecture - 1

Multiprocessing Operating System

Introduction

There are many types of operating system. One of them is Multiprocessing operating system. It is used to control the functions of a computer system that uses multiple processors. The processors are connected with physical memory, computer buses, clocks, and peripheral devices. The operating works by assigning different tasks of a process to different processors. It also allocates the shared resources to different processors as and when required.

The main objective of using multiprocessor operating system is to consume high computing power and increase the execution speed of system.

Multiprocessing Operating System controls the following four major components, which are used in the multiprocessing system.

- **CPU –** CPU is capable to access memories as well as controlling the entire I/O tasks.
- **IOP –** I/P processor can access direct memories, and every I/O processors have to responsible for controlling all input and output tasks.
- **Input/output Devices –** These devices are used for inserting the input commands, and producing output after processing.
- **Memory Unit –** Multiprocessor system uses the two types of memory modules such as shared memory and distributed shared memory.

Characteristics of Multiprocessor operating system

- The Multi processor OS allows communication between multiple CPUs with their shared memory and input/output devices.
- Multi processor OS can use different types of processor as per the need, such as central processing unit (CPU) or an input- output processor (IOP).
- Multi processor OS has a better reliability.
- If a processor fails due to any reason the other processors can handle all functions of the faulty processor.
- Multiprocessor system provides many benefits to enhance the system performance.
- Multiprocessor OS uses different compilers. They are able to identify the parallelism in a user's program in automation mode.
- Multiprocessors OS is categorized by their memory management such as shared memory or tightly coupled multiprocessor.

Advantages

There are list of several advantages of Multiprocessor operating system such as

- **Greater reliability**: If due to any reason, one processor fails to work there is no need to worry because the entire system will not stop rather work properly. The OS divides the work among the remaining processors and the work is carried on as usual. For example – if multiprocessor has 6 processors and any one processor does not perform properly, at this stage rest of them processors are assigned the responsibilities to handle this system.

- **Better throughput**: The OS is able to enhance the throughput of the system. The entire system improves because the multiple processors work in collaboration and perform computing in parallel.
- **Cost Effective System**: Multiprocessor systems are cost effective compared to single processor system in long run because this system is capable of sharing all input/output devices, power supplies system, and data storage units. In multiprocessor, there is no need to connect all peripheral terminals separately with each processor.
- **Parallel processing**: Multiprocessor O/S gets high performance due to parallel processing. In this system, single job is divided into various same small jobs, and different processors execute them in Parallel.

Disadvantages:

- Multiprocessor OS is complicated in nature in both form such as H/W and S/W.
- It is more expensive due to its large architecture.
- Multiprocessor operating system has a daunting task for scheduling processes due to its shareable nature.
- Multiprocessor OS system needs to manage large memory due to its sharing with other resources.
- Its speed can slow down when a processor stops or fails.
- It has more time delay when a processor receives message and takes appropriate action.
- It needs context switching which can be impacted its performance.