Performance Development

o/s attempted to schedule computational activities to ensure good performance , where many facilities had been added to o/s some of these are :

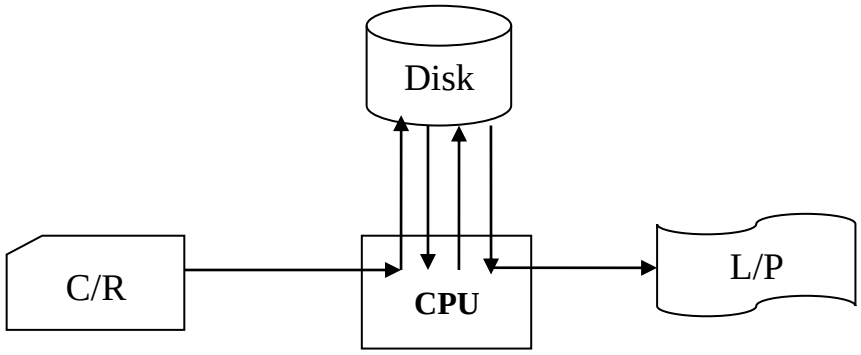
a- Spooling (Simulataneous Peripheral operation On- Line)

1- Spooling uses the disk as a very large buffer for reading as far a Head as possible on input devices and for storing output files until the output devices are able to accept them.

2- Spooling is now a standard feature of most O/S .

3- Spooling allows the computation of one job can overlap with the I/O of another jobs , therefore spooling can keep both CPU and I/O devices working as much higher rates.

4- The figure below show the spooling layout



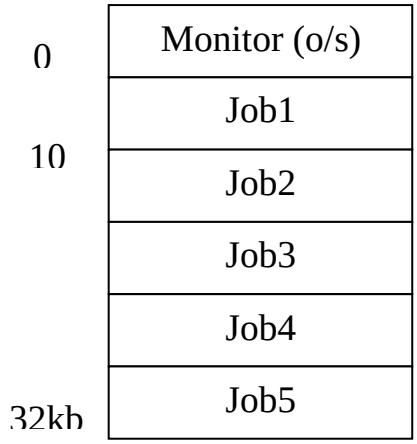
The spooling layout

b- Multiprogramming batch system

1- Spooling provides an important data structure called a job pool kept on disk. The O/S picks one job from the pool and begin to execute it.

2- In multiprogramming system , when the job may have to wait for any reason such as an I/O regrets , the O/S simply switches to and executes another job .when the second job need to wait the CPU is switches to another job and so on . Then the CPU will never be idle.

3- The figure below show the multiprogramming layout where the O/S keeps several jobs in memory at a time . This set of jobs is a subset of the jobs kept in the job pool.



The multiprogramming layout

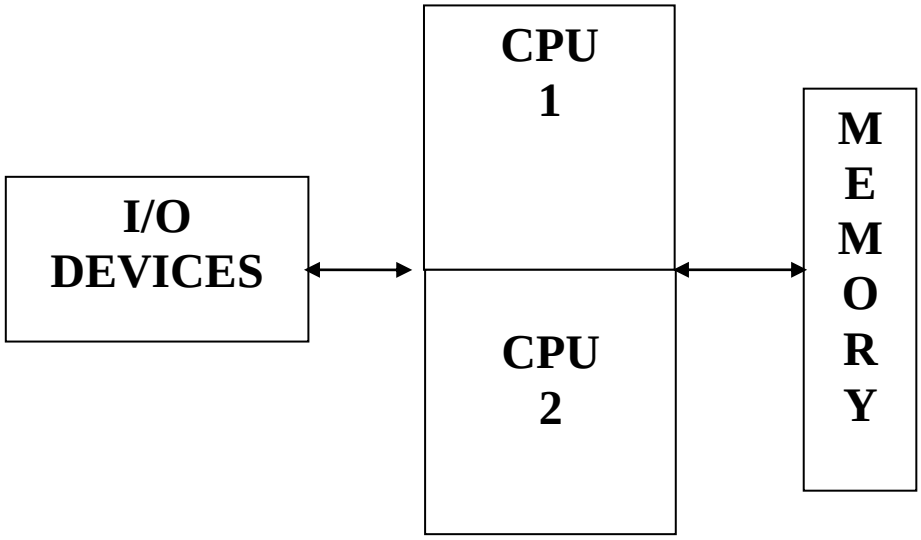
2-Time Sharing System

This type of o/s provides on- line communication between the user and the system , where the user will give instruction to the o/s or to the program directly (usually from terminal) and receivers an intermediate response , therefore some time called an interactive system .
The time sharing system allows many users simultaneously share the computer system where little CPU time is needed for each user.
As the system switches rapidly from one user to the next user is given the impression that they each have their own computer , while actually one o/s shared among the many users.

- Advantage : reduce the CPU ideal time
- Disadvantage : more complex.

3-Parallel systems

1- Most systems to date are simple –processor system that is they have one main CPU.
2- There is a trend to have multiprocessor system , where such systems have more than one processor in close communication sharing the computer Bus , the clock , and some times memory and peripheral devices, in the figure below
3- The advantage of this type of systems :



Parallel system layout

1- Increase throughput
2- The cost
3- Increase reliability

There are two types of processors in multiprocessors systems:-

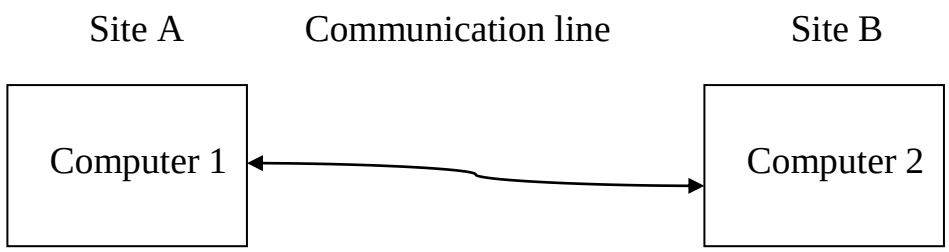
a- Symmetric multiprocessor
b- Asymmetric multiprocessor

4-Distributed systems

1- A recent trend in C/S is to distribute computation among several processor.

2- In contrast to the parallel system , the processors do not share memory and clock.

3- The processors communicate with one another through various communication lines, such as high speed buses or telephone lines. This type of systems called a distributed system.



Distributed system

There are many reasons to build this type of system :-

1- Resource sharing
2- Computation speed up
3- Reliability
4- communication

5-Real time system

A real time system is used when there are rigid time requirement on the operation of a processor or the flow of data. A real time system guarantees that critical tasks complete on time . The secondary storage of any sort is usually limited , data instead being stored in short term memory (ROM)

There are two categories of real time system :

1- hard real time systems
2- soft real time systems