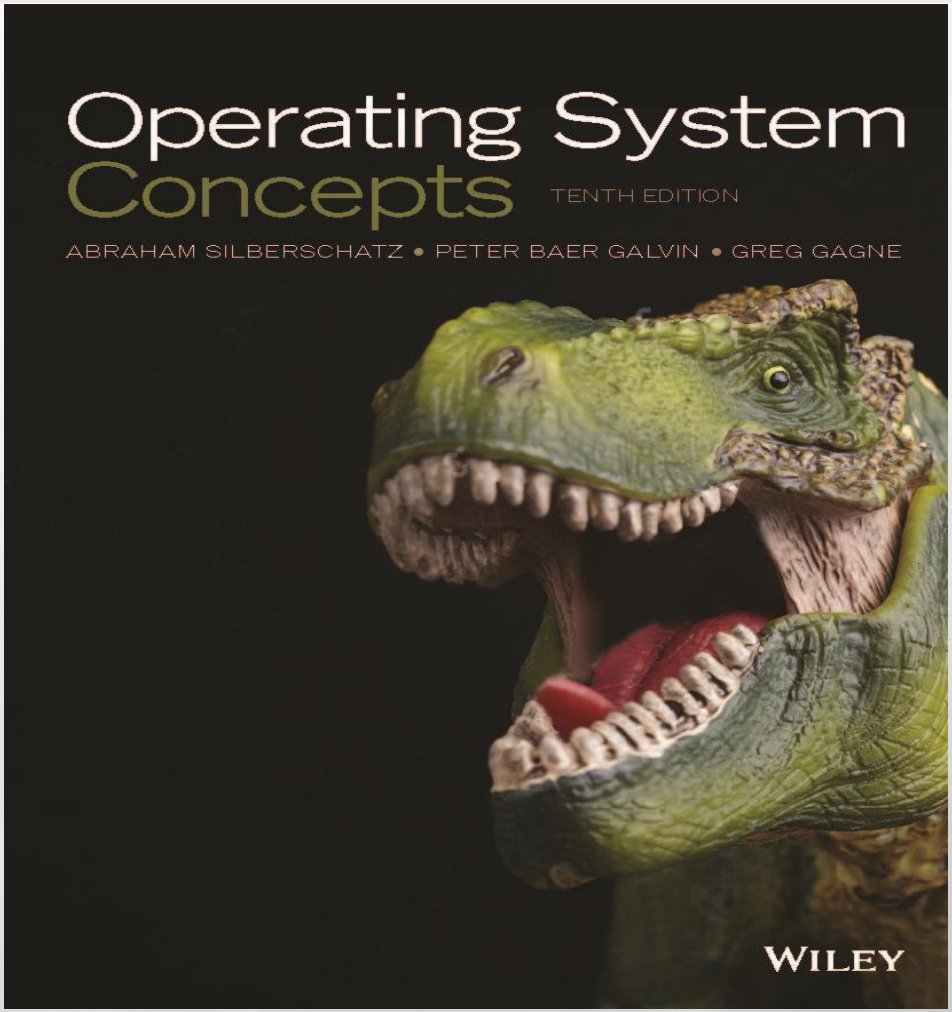
Mustansiriayah University
Collage of Education
Computers Science Department

Chapter One
Part 2



Fourth Class

2019-2020

1.6. Performance Development

- O.S. attempted to schedule computational activities to ensure good performance, where many facilities had been added to

نظام التشغيل يحاول جدولة الأنشطة الحسابية لكي يضمن انجاز جيد حيث تم اضافة بعض التسهيلات اليه

O.S. some of these are:

1. **On-Line and off-Line operations**

2. **Buffering (التخزين المؤقت)**

   a- The single-buffered

   b- The Double-buffering

3. **Spooling**

1.6.1. On-Line and Off-Line Operations

- A special subroutine was written for each I/O device called a device-driver.

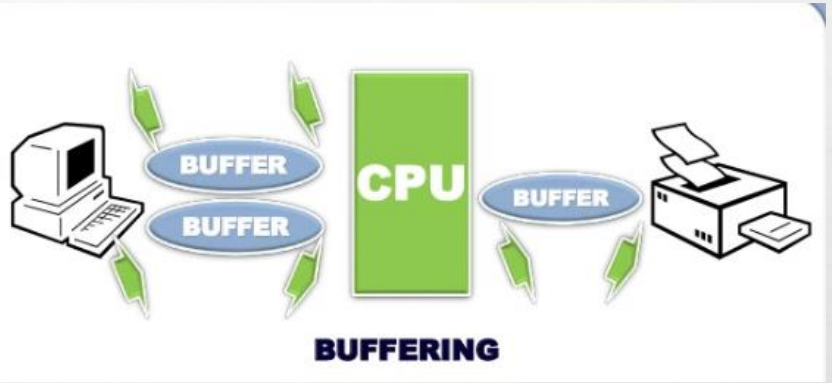
برنامج فرعي خاص تم كتابته لكل I/O device يسمى بالـ device-driver

- Some peripherals (I/O devices) has been equipped (مجهزة) for:
  - either On-Line operation, in which they are connected to the processor.
  - or off-line operations in which they are run by control units not connected to the central computer system

بعض الـ I/O devices مجهزة بـ
- On-Line operation والتي تكون مرتبطة بالـ processor
- Off-line operations والتي تنفذ عن طريق الـ control units وتكون غير مرتبطة بالـ central computer system

1.6.2. Buffering

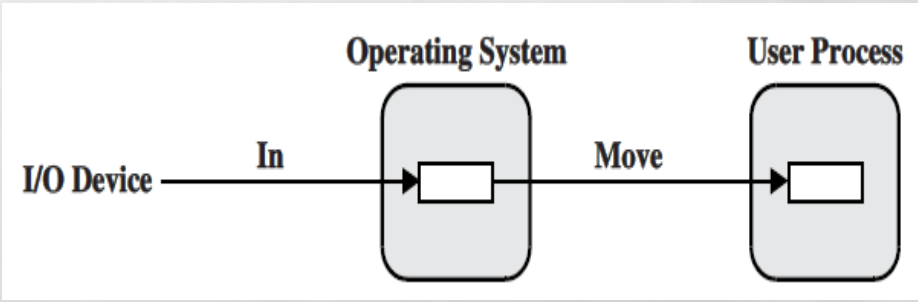
- **A buffer** is an area or primary storage for holding (يمسك) data during I/O transfers



- On **input,** the data placed in the buffer by an I/O channel, when the transfer is complete the data may be accessed by the processor.

There are two types of buffering:

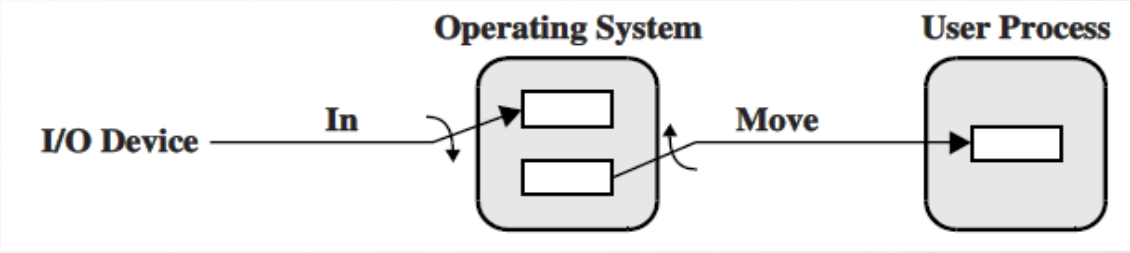
1. The single-buffered



The channel deposits (يودع) data in a buffer, the processor will accessed that data, the channel deposits the next data, etc. while the channel is depositing data, processing on that data may occur.

Buffering Cont.

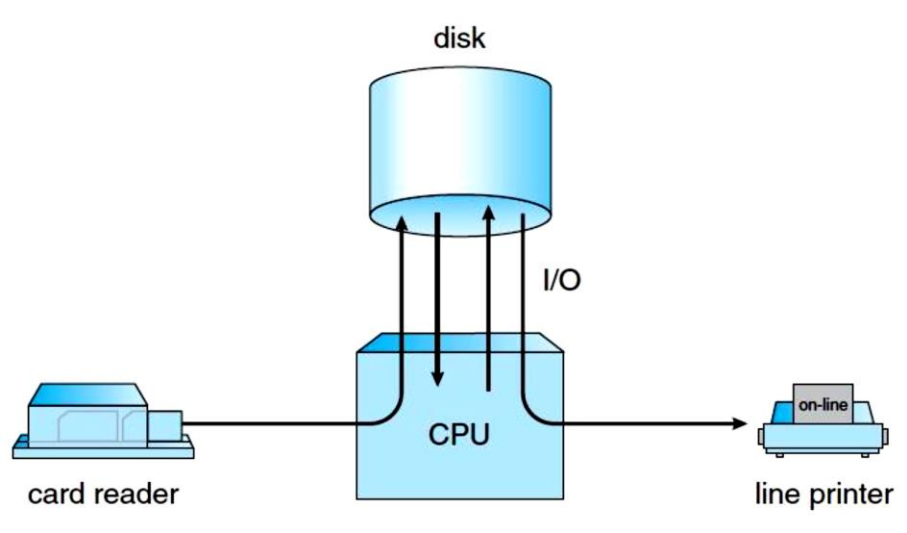
2. The Double Buffering



- This system allows overlap (تداخل) of I/O operations with processing
- While the channel is depositing (يودع) data in one buffer the processor may be processing data in the other buffer
- When the processor is finished processing data in one buffer it may process data in the second buffer
- **In buffering the CPU and I/O are both busy.**

Spooling

- Spooling uses the disk as a very large buffer for:
  - Reading as input devices
  - And for storing output files until the output devices are able to accept them
- Spooling allows the computation of one job to overlap with the I/O of another jobs
- Therefore spooling can keep both CPU and the I/O devices working as much higher rates



1.7. Multiprogramming

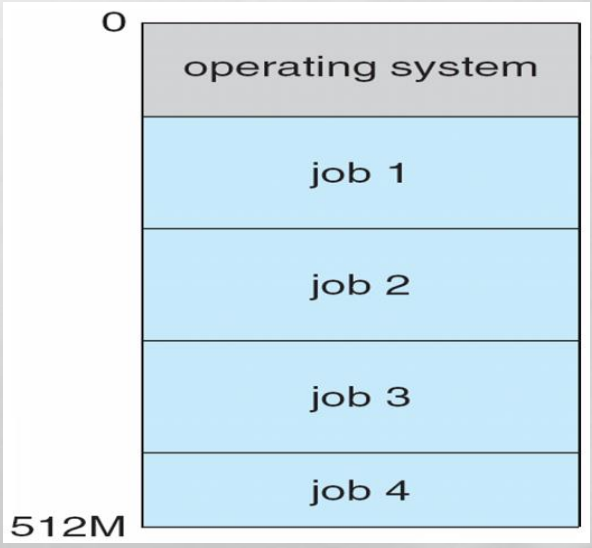
- Spooling provides an important data structure called a **job pool** kept on disk, the O.S. picks one job from the pool and begin to execute it.

- In **multiprogramming system:**
  - When the job may have to wait for any reason such as an I/O request, the O.S. simply switches to and executes another job.

  - When the second job needs to wait the CPU is switches to another job and so on.

The CPU will never be idle

- The figure shows 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.**



1.8. Parallel Systems

- Computers today, are **multiprocessors system**, also known as **Parallel systems,** these multiprocessors sharing the computer Bus, the clock, and sometimes memory and peripheral devices

The advantages:

- Increase the throughput .
- Save money compared to multiple single systems because the processors can share peripherals, cabinets, and power supplies.
- Increase reliability (الموثوقية)

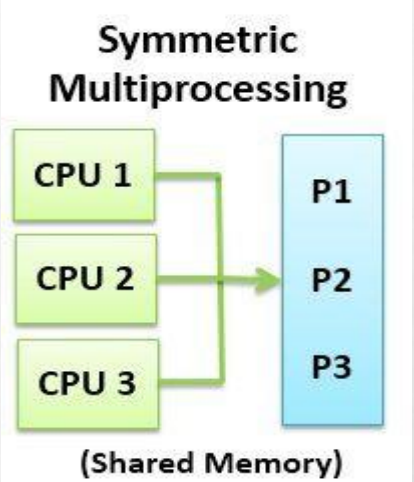
Two types:

1. **Asymmetric Multiprocessing**
2. **Symmetric Multiprocessing**

Multiprocessing Systems

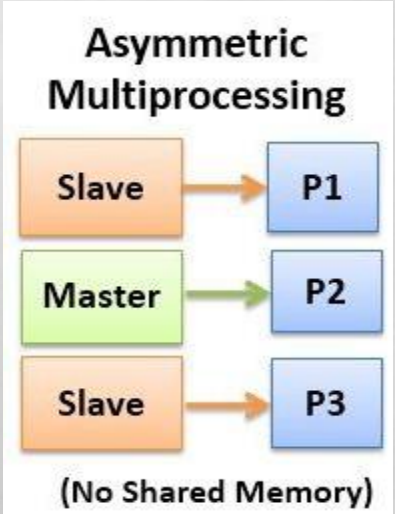
1. Symmetric Multiprocessing

- Each processor performs all tasks, means that all processors are peers;
- No master-slave relationship exists between processors.



2. Asymmetric Multiprocessing

- Each processor is assigned a specific task.
- A master processor controls the system; the other processors either look to the master for instruction or have predefined tasks.
- This scheme defines a Master-Slave relationship.
- The master processor schedules and allocates work to the slave processors.



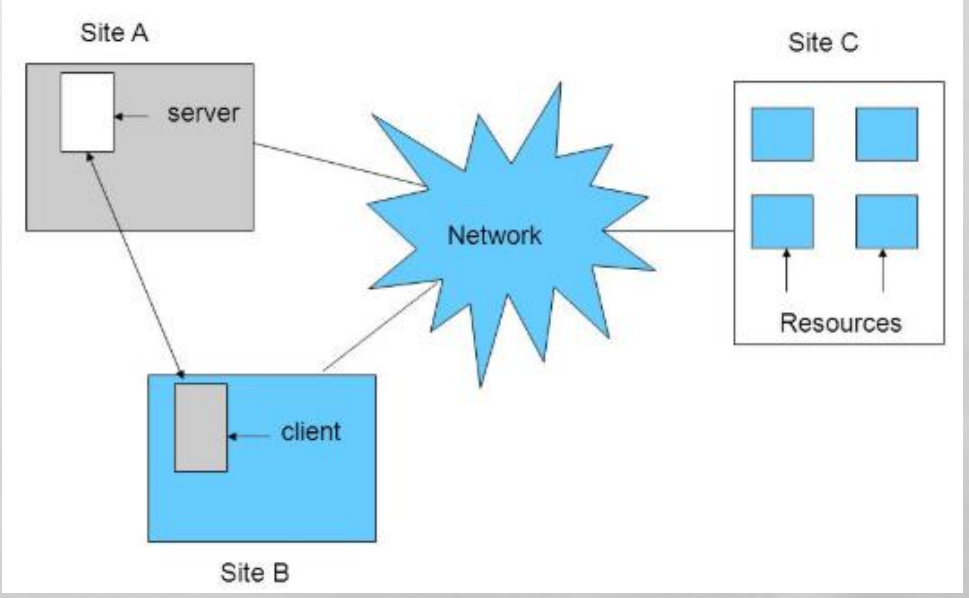
1.8. Distributed Systems

- A resent C/S is to distribute computation among several processors.
- In Contrast (نقيض) to the parallel system, the processors do not share memory and clock.

- The processors communicate with one another through various communication lines, such as high speed buses or telephone lines.

- The reasons for building distributed systems:

1. Resource sharing
2. Computation speedup
3. Concurrently
4. Reliability



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