CSC369 Week 1 Notes

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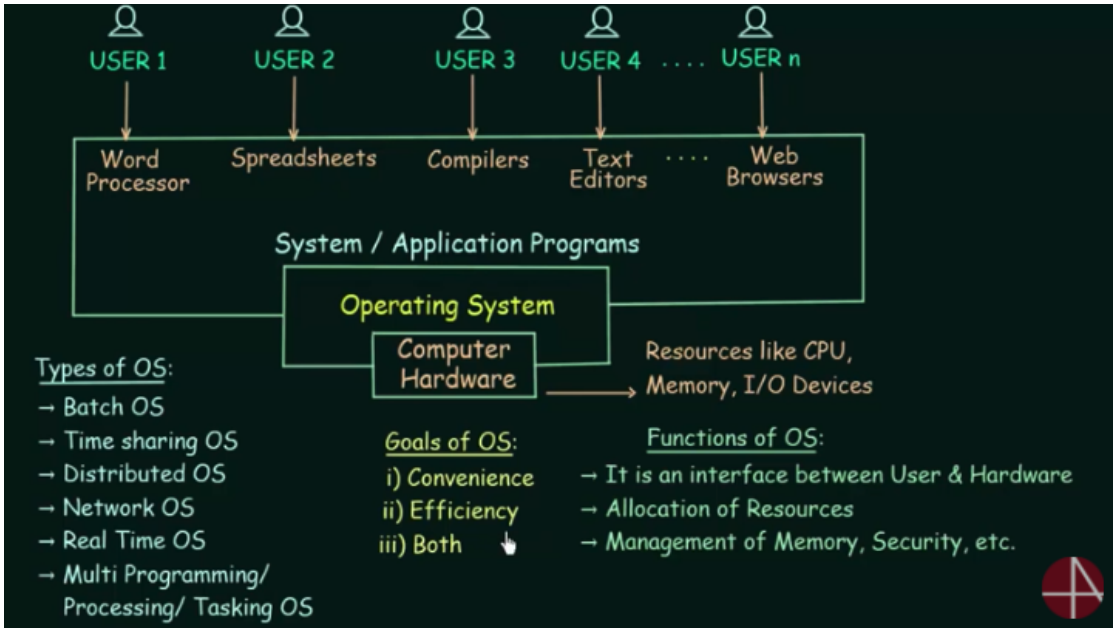
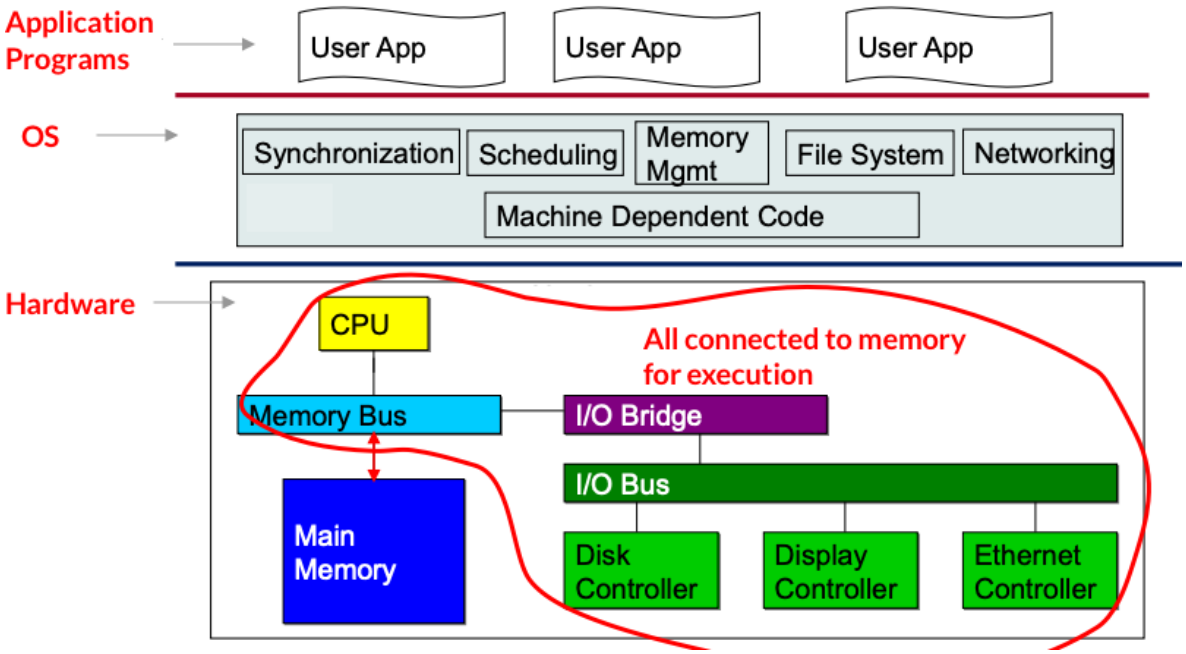
1 Intro to OS

- What is Operating System
  - is the program that manages the computer hardware
  - is the software layer between user applications and hardware
  - is used for
    - Allication of resources
    - Management of memory, security, etc.

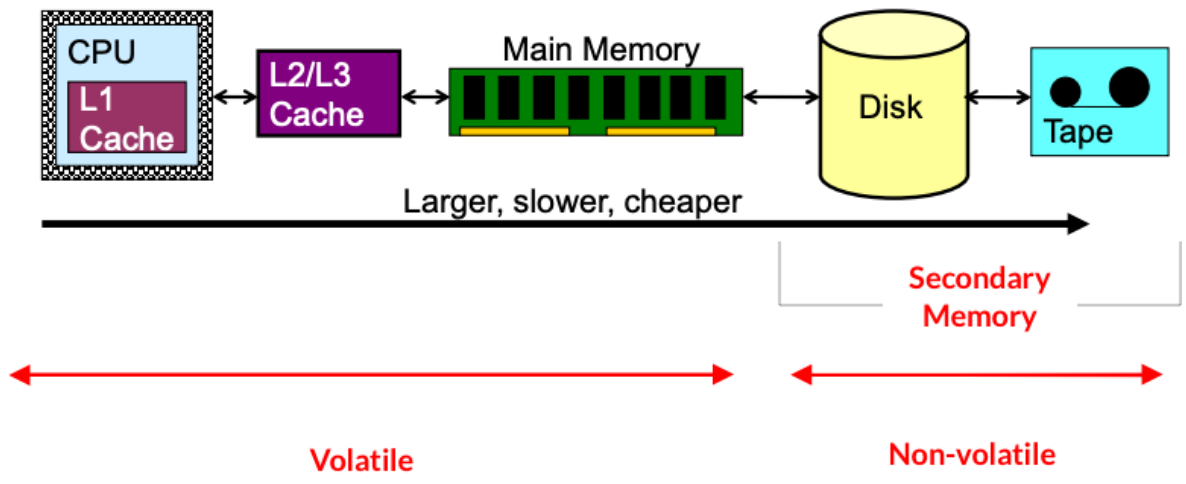


- Overview of Computer System



  - All hardware devices are connected through common **bus** and are loaded to memory for execution.
  - **Synchronization:** to ensure orderly acces to the shared memory

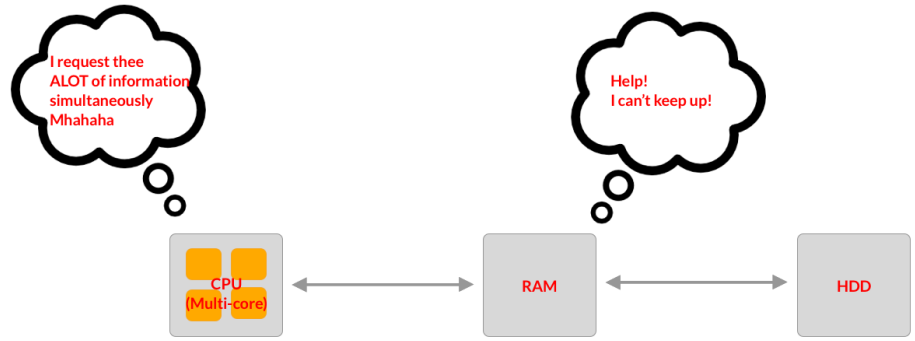
- Storge Hierarchy / Storage Structure

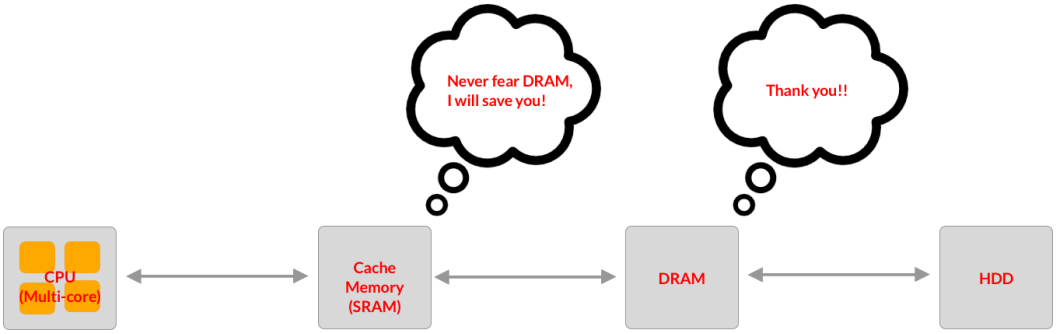


  - **Volatile** → Loses contents when power is removed
  - **Non-volatile** → Retains contents even when power is removed

- Caching / Cache Memory

  - Is also called **Static Random Access Memory (SRAM)**
  - Is more costly
  - Hides performance differences when large access-time gap exsists between two levels
    * Quad-quare requesting RAM for information





  - More can be found here

- Concurrency
  - Is execution of several instruction sequences at same time
    * i.e, CPU and device controllers
  - **Interrupt:** are signals sent to the CPU by external devices, (usually I/O devices)
    * It's like telling 'Hey CPU, please stop this process, and do y instead, since this is more important'
    * i.e. Network Packet has arrived, Disk I/O comeplete occured
  - **System Call:** are interrupt signals sent by software
    * Is a programmatic way of a program requesting for service to kernel of operating system
    * i.e. Accessing a hard-disk drive
  - IMPORTANT: An operating system is an event-driven program.

2 Process Threads

- Part 1: The Process Concept
  - **Process:** is a program in execution
  - **Threads:** is the unit of execution within a process.

$$\text{Thread} = \frac{\text{Job}}{\text{Unit of Work}} \tag{1}$$

    * A process can have anywhere from one thread to many threads
- Process Data Structure
- Process Control Block
- Linux PCB
- Process States & State Changes
- State Queues
- PCBs And State Queues
- Context Switch
- Operations on Processes
- Process Creation
- fork()
- Duplicating Address Processes
- Divergence
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