



CSCA0102

IT & Business Applications

Foundation in Business Information Technology
School of Engineering & Computing Sciences
FTMS College Global

Chapter 2

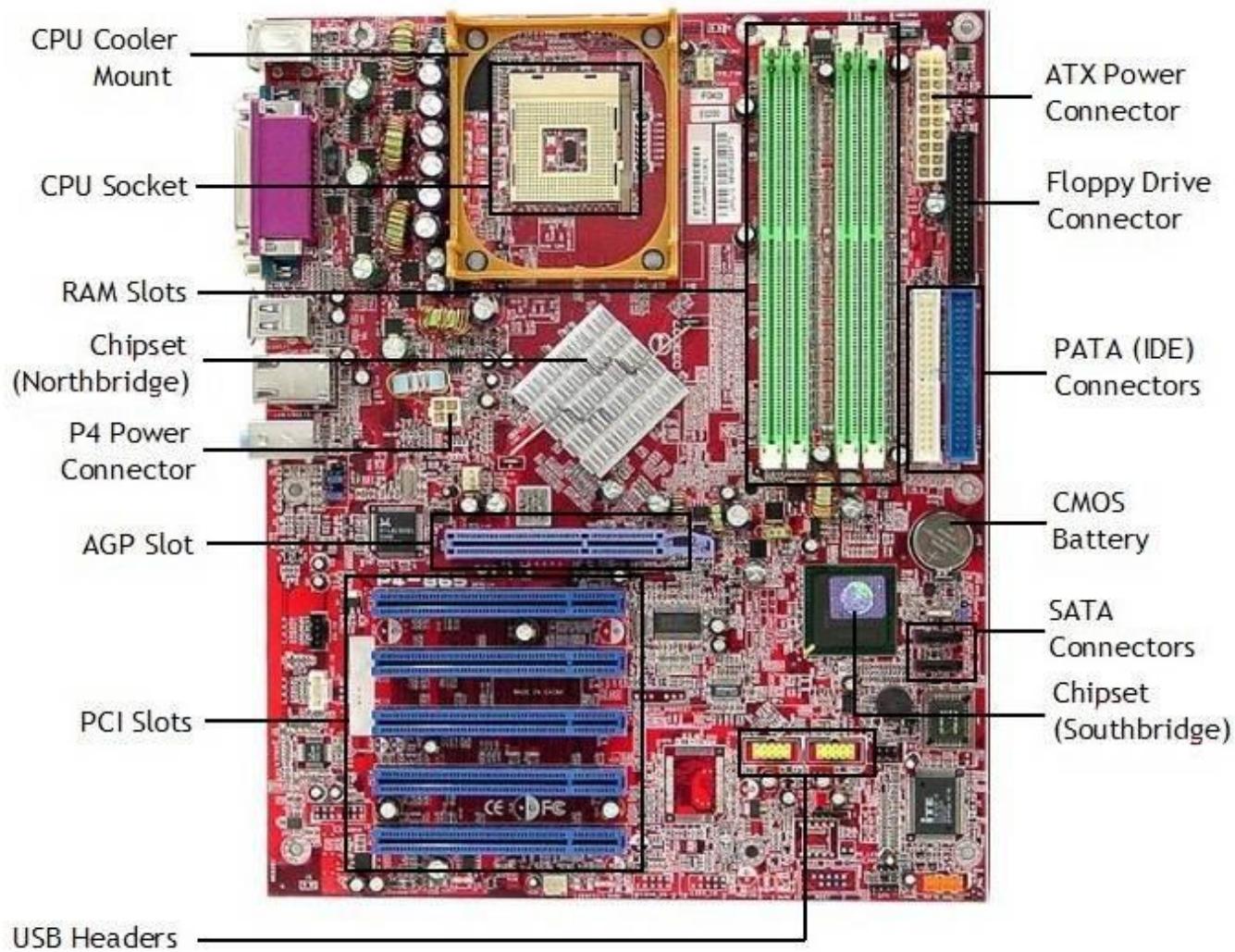
Data Storage Concepts



System Unit

- The system unit is the core of a computer system.
- The most important of these components is the central processing unit (CPU), or microprocessor, which acts as the "brain" of your computer.
- Another component is random access memory (RAM), which temporarily stores information that the CPU uses while the computer is on.
- Almost every other part of your computer connects to the system unit using cables.

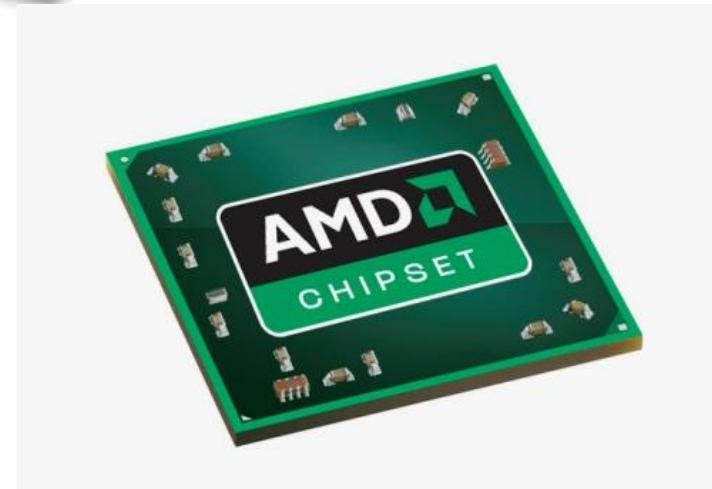
Motherboard



Motherboard

- The main circuit board of a microcomputer.
- The motherboard contains the connectors for attaching additional boards.
- The motherboard contains the CPU, BIOS, memory, mass storage interfaces, serial and parallel ports, expansion slots, and all the controllers required to control standard peripheral devices.,

Processor



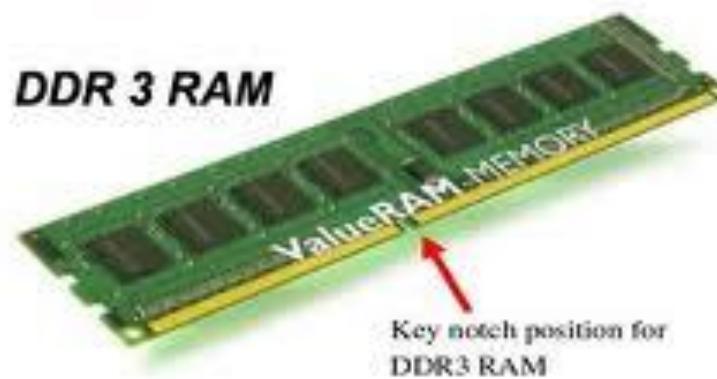
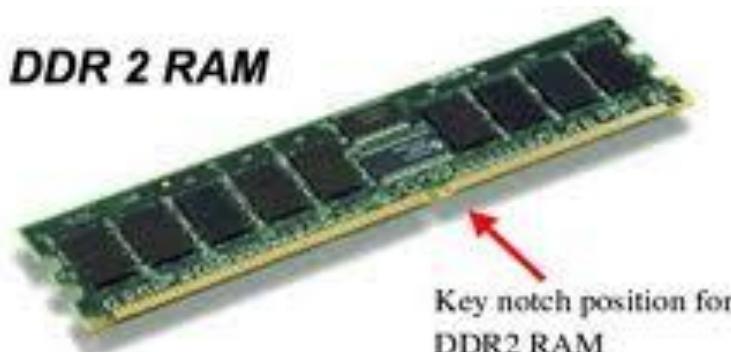
Processor

- A silicon chip that contains a CPU
- Three basic characteristics differentiate microprocessors:
 - **Instruction set:** The set of instructions that the microprocessor can execute.
 - **Bandwidth :** The number of bits processed in a single instruction.
 - **Clock speed :** Given in megahertz (MHz), the clock speed determines how many instructions per second the processor can execute.

Placing Microprocessor



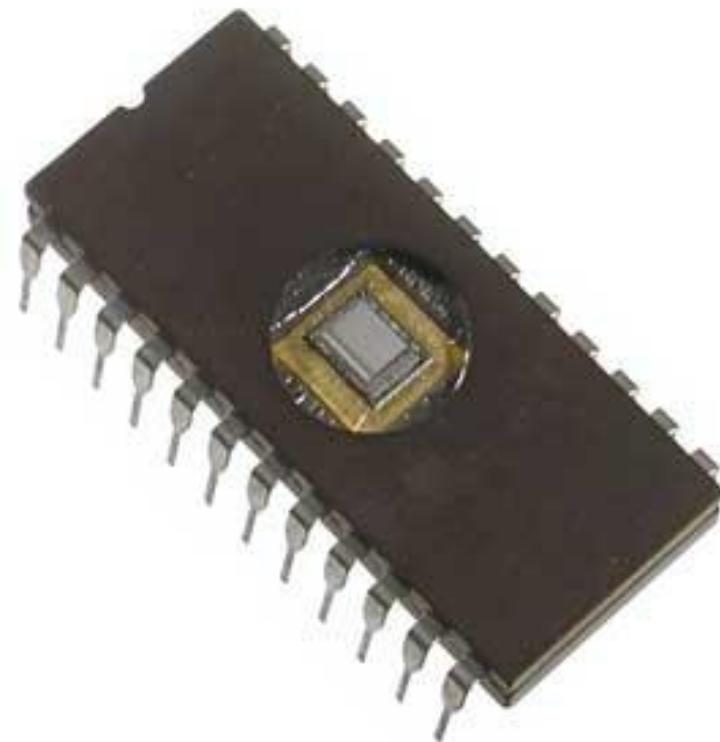
Random Access Memory (RAM)



Random Access Memory (RAM)

- A type of computer memory that can be accessed randomly.
- There are two different types of RAM:
 - **DRAM (Dynamic Random Access Memory)**
 - **SRAM (Static Random Access Memory).**
- The two types of RAM differ in the technology they use to hold data, with DRAM being the more common type. In terms of speed, SRAM is faster. DRAM needs to be refreshed thousands of times per second while SRAM does not need to be refreshed, which is what makes it faster than DRAM.

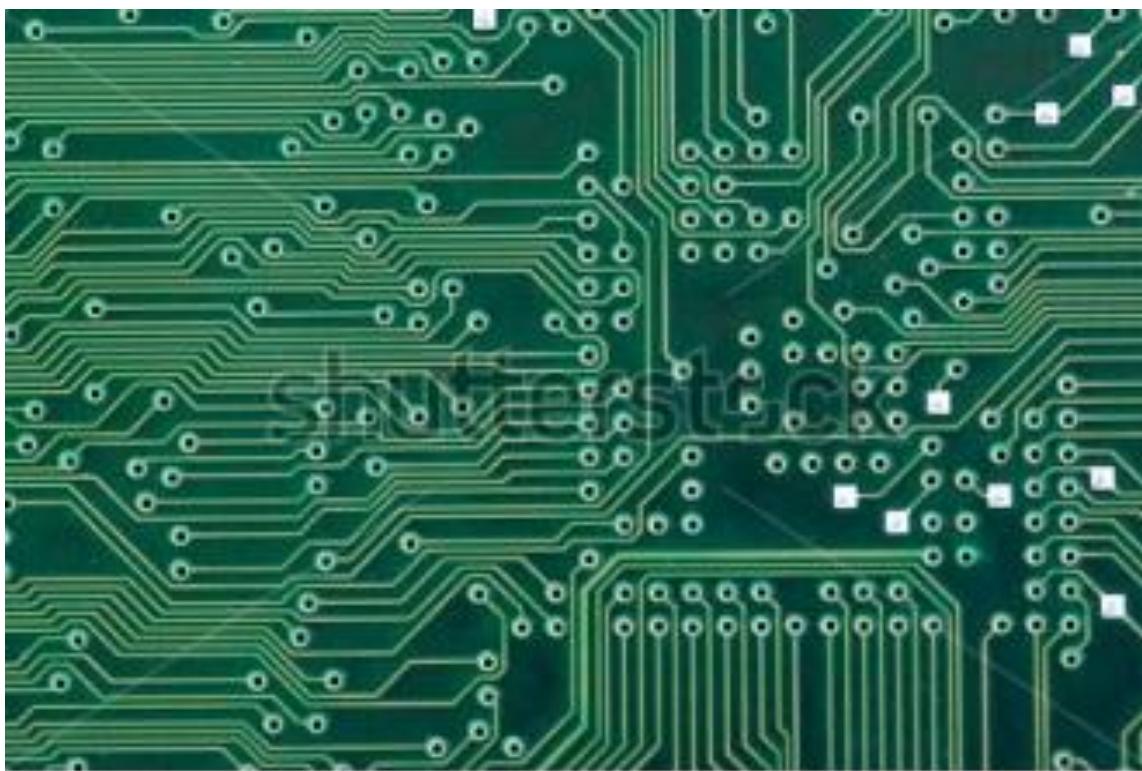
READ Only Memory (ROM)



READ Only Memory (ROM)

- Computer memory on which data has been prerecorded.
- Once data has been written onto a ROM chip, it cannot be removed and can only be read.
- ROM retains its contents even when the computer is turned off.

Bus



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Bus

- A collection of wires through which data is transmitted from one part of a computer to another.
- Connects all the internal computer components to the CPU and main memory.

Ports

- An interface on a computer to which you can connect a device.
- Personal computers have various types of ports.
- Internally, there are several ports for connecting disk drives, display screens, and keyboards.
- Externally, personal computers have ports for connecting modems, printers, mice, and other peripheral devices.

Serial Ports



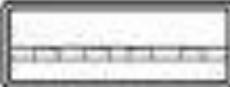
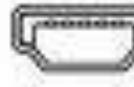
Parallel Ports



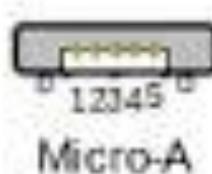
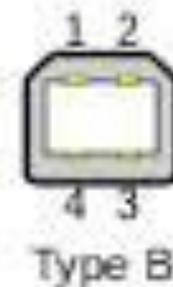
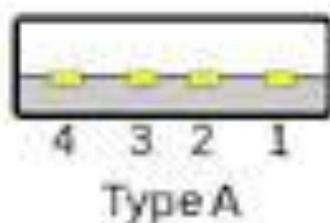
USB Ports



USB Types

Type	Port Image	Connector Image
Type A	4.5mm x 12.0mm 	
Type B	7.3mm x 8.5mm 	
Mini-A	3.0mm x 6.0mm 	
Mini-B	3.0mm x 6.0mm 	

USB Ports



Data Storage

Examples:

- Floppy disk
- Hard disk
- Optical disc
- Removable media

Data Storage

File System:

- A **file system** (or **filesystem**) is used to control how information is stored and retrieved.
- Without a file system, information placed in a storage area would be one large body of information with no way to tell where one piece of information stops and the next begins.

Data Storage

File System: FAT32 vs. NTFS

- FAT (File Table Allocation)
- NTFS (New Technology File System)
- NTFS
 - Faster
 - Safer
 - More space-efficient

Data Storage

Bits and Bytes

- All computer data is stored in a **binary** format as either a one or zero (called a **bit**).
- Eight of these bits together are most commonly called a **byte**.
- Storage capacity is measured by a prefix to the B (**byte**) to represent a specific amount, ie **K** (**Kilobyte**), **M** (**Megabyte**), **G** (**Gigabyte**), **T** (**Terabyte**) etc.

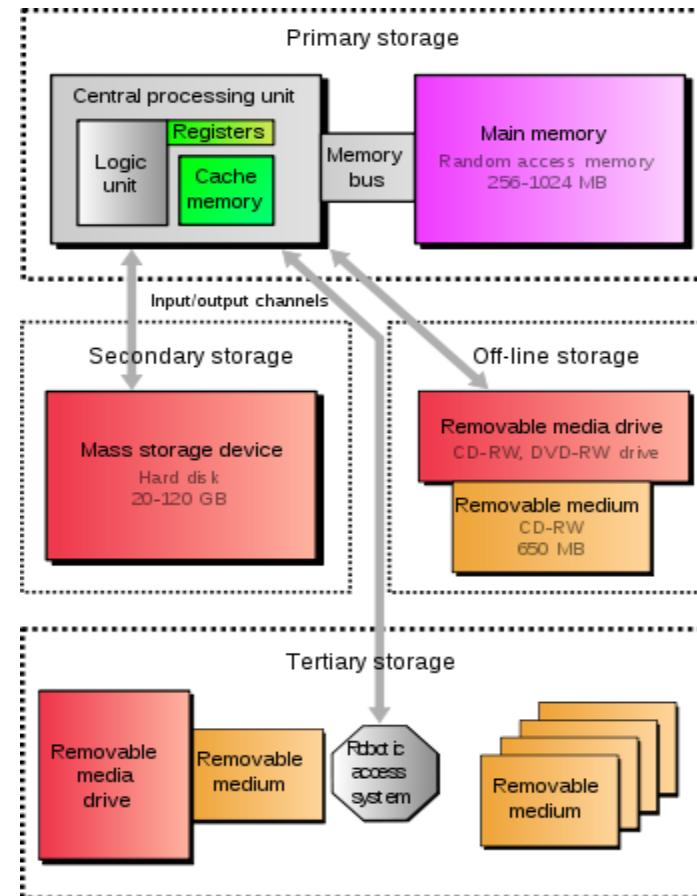
Data Storage

Bits and Bytes

- Kilobyte (KB) = 1,024 Bytes
- MegaByte (MB) = 1,024 Kilobytes or 1,048,576 Bytes
- Gigabyte (GB) = 1,024 Megabytes or 1,073,741,824 Bytes
- Terabyte (TB) = 1,024 Gigabytes or 1,099,511,627,776 Bytes

Data Storage

Type of Storage



Data Storage

Type of Storage

- **Primary Storage**
- A storage location that holds memory for short periods of times while the computer running.
- Example: computer RAM and cache

Data Storage

Type of Storage

- **Secondary Storage**
- A storage medium that holds information until it is deleted or overwritten regardless if the computer has power.
- Example: hard disk

Data Storage

Type of Storage

- **Off-line Storage**
- Term used to describe any storage that is removable and cannot be accessed by the computer once removed.
- Off-line storage allows a user to store information that will not be affected by computer viruses or hardware failure.
- Example: floppy disk

Data Storage

Type of Storage

- **Tertiary Storage**
- Typically it involves a robotic mechanism which will *mount* (insert) and *dismount* removable mass storage media into a storage device according to the system's demands.
- Example: tape libraries and optical jukebox

Data Storage

Storage Technologies

- Semiconductor
- Magnetic
- Optical
- Paper

Data Storage

Storage Technologies

- **Semiconductor**
- Uses semiconductor-based integrated circuits to store information.
- Example: RAM, Flash memory

Data Storage

Storage Technologies

- **Magnetic**
- Magnetic storage uses different patterns of magnetization on a magnetically coated surface to store information.
- Example: Hard disk, floppy disk, tape

Data Storage

Storage Technologies

- **Optical**
- the typical optical disc, stores information in deformities on the surface of a circular disc and reads this information by illuminating the surface with a laser diode and observing the reflection.
- Example: CD, DVD, BD

Data Storage

Storage Technologies

- **Paper**
- typically in the form of paper tape or punched cards, has long been used to store information for automatic processing, particularly before general-purpose computers existed.
- Example: punch card