The basics of Computer Hardware

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1

Introduction to computer hardware

What components makes the computer hardware?

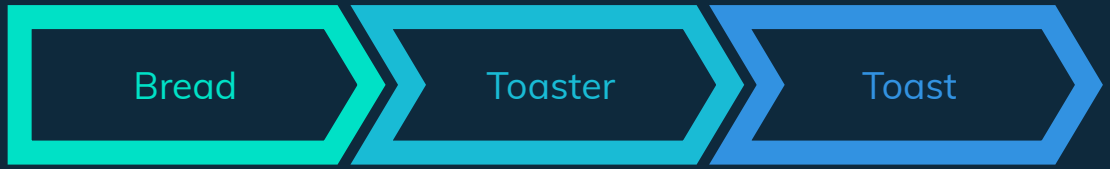
“ The computer is a tool that we use almost everyday. It is thus important to understand how its components are organised and how it fonctions concretely! ”

Let’s get started!

Introduction

To make this concept simple, let's compare a computer to another tool we often use in the morning: a **toaster**. How does it work?

- We put a piece of **bread** inside the toaster
- We press a button and wait for a certain amount of time
- The toaster does something to the bread
- At the end, it pops a piece of **toast**

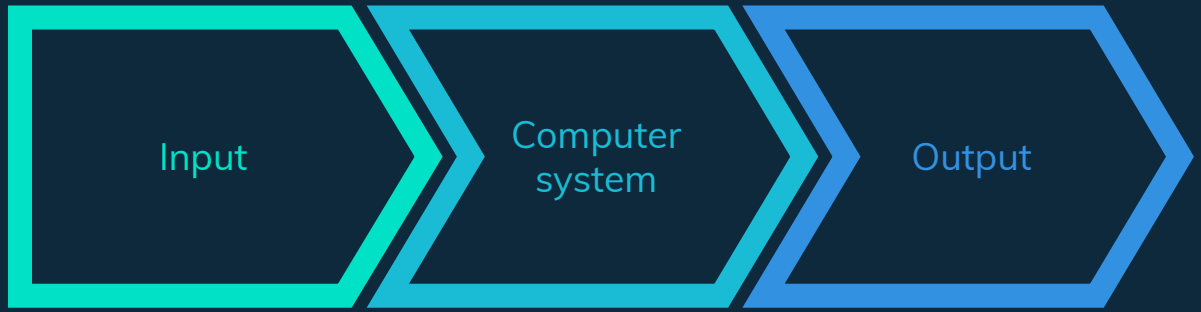


A computer works the same way!

Introduction

For the computer:

- You give it some **data or information** as **input**
- The computer does something to it
- At the end, it returns a **modified product** as **output** to you



2

Internal components of a computer

Which components do we find inside the computer?

Internal components: The case

A computer is made up of **many components** that work together in **processing information**.

- The outer shell is called the **case.**
- Its primary function is to **keep the components inside nice and safe** from things that are on the outside
- It also helps to **keep the system cool**

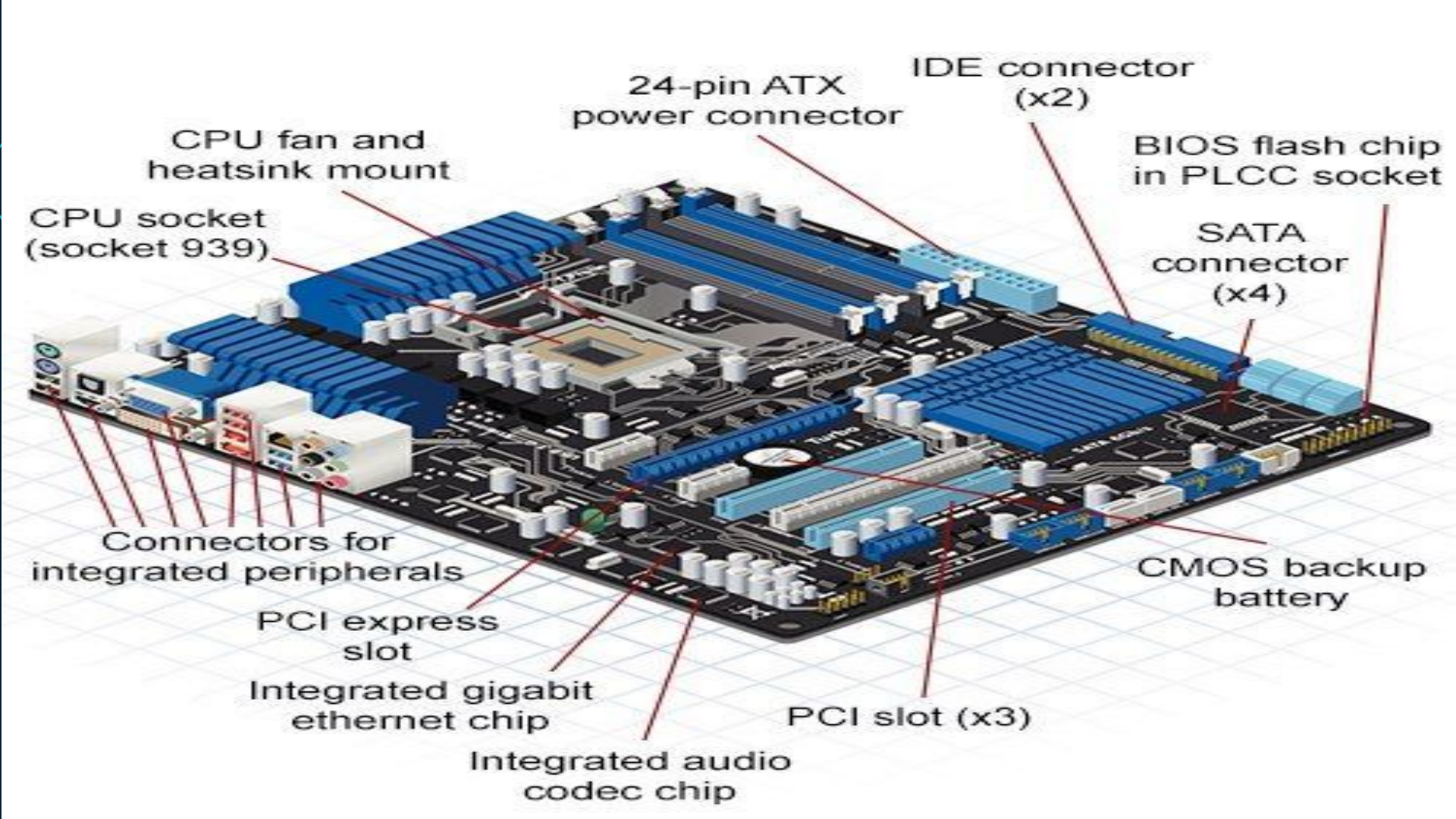
Internal components: The Power supply

- The **power supply** takes power from the **electric source** to spread it out in all the components of the computer
- In other words, **it supplies power to the internal components of your computer**
- During the mounting of the computer system, the power supply is chosen depending on **how much hardware we have** inside the system and also the **overall power needed** inside

Internal components: The Motherboard

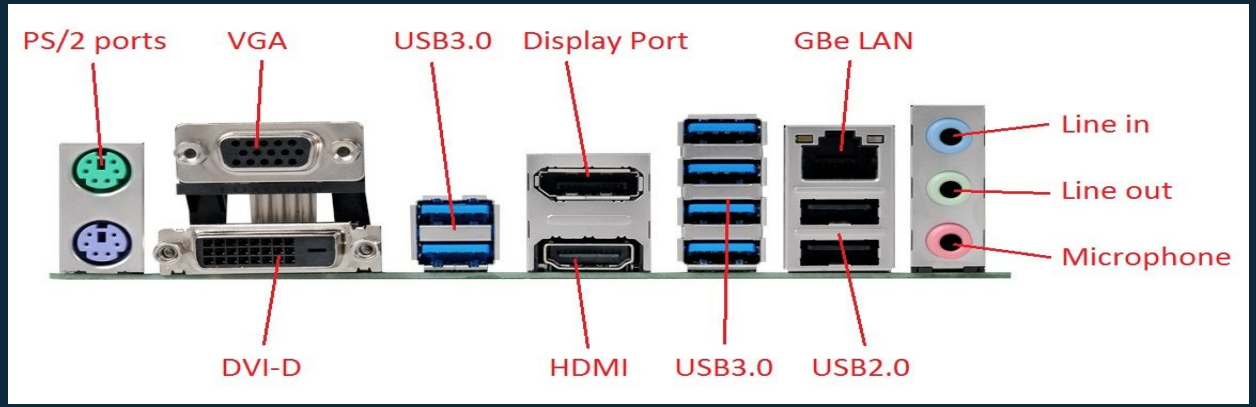
The **system motherboard** is a big card where all other components are connected. It allows all the components to communicate with each other

- It has **slots** and **ports** that allow you to connect peripherals, extension cards etc.
- There are many components that are basically inserted or included on the motherboard such as the **Bios**
- **BIOS** stand for **Basic Input Output System** contains basic informations needed for your computer to start well


IDE connector (x2)
24-pin ATX power connector
CPU fan and heatsink mount
BIOS flash chip in PLCC socket
CPU socket (socket 939)
SATA connector (x4)
Connectors for integrated peripherals
CMOS backup battery
PCI express slot
Integrated gigabit ethernet chip
PCI slot (x3)
Integrated audio codec chip

Internal components: The Motherboard

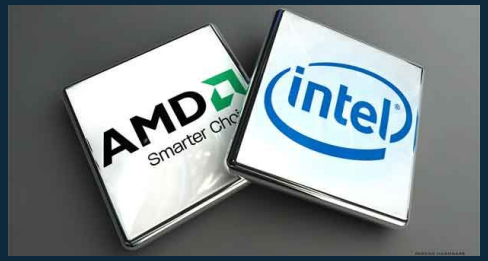
- The motherboard also comprises various **ports** where we can **plug all our devices**



Internal components: The CPU

The **CPU** (**Central Processing Unit**) **is the big brain of the computer**

- It processes all the informations in a computer
- Its main characteristic is its **Frequency**, measured in **Hertz** (**MegaHertz, GigaHertz**)
- There are two main companies that produce CPUs. We have **Intel** and **AMD**



The Central Processing Unit

The big brain of the computer

Internal components: The CPU's Heat sink

- While processing informations, the CPU gets quite hot and need to be cooled. That is why, we need a **heat sink**
- This component's function is to **keep the chip underneath nice and cool**

NB: The CPU is quite powerful at processing but it doesn't store anything. That is why storage devices are needed!

Internal components: The Hard drive

The **Hard drive** is the component that **stores all the softwares, the files and folders in our computer**

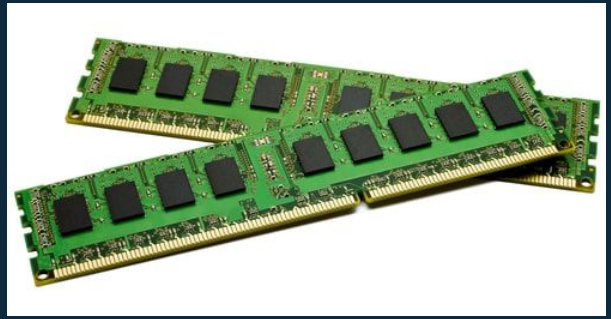
- It is the computer's **long term storage**
- We have two main **types of Hard drive**:
  - The **Static Drive** or **HDD (Hard Disk Drive)** made up of a platter which spins around, with an arm and its head to read the informations stored in there
  - The **Solid State Drive** or **SSD** is mostly used nowadays and it is much more faster

Hard drive

Long term computer storage device

Internal components: The RAM

- To process information, the CPU also needs a short term memory: the **RAM**
- **RAM** stands for **Random Access Memory**
- The bigger your RAM is, the more you can execute many tasks on your computer simultaneously without it **slowing down**



Internal components: Extension cards

- These are additional cards used to **extend the abilities of a computer**
- These cards are plug on slots of the motherboard
- We have many examples of **extension cards** we can plug on the motherboard. The ones commonly used are:
  - **The video card**
  - **The sound card**
  - **The network card**

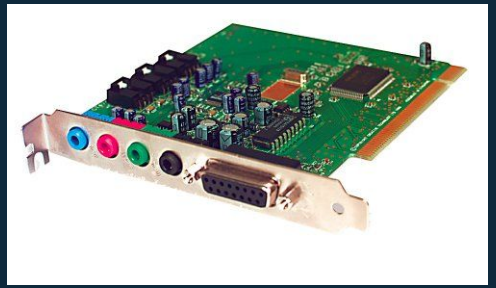
Internal components: Extension cards

The video card

This cards is needed to display informations on the monitor

The sound card

This card is responsible for all the sounds you hear on speakers, earphones etc.



The network cards

This card allows us to connect the computer to a network

Internal components: The Drive

- The **Drive** is **design to play all the optical disks such as the CD, DVD, Blu Ray etc.**

What about the laptop?

A laptop contains all of these components.

It is just more compact, the components are tiny and are assembled more efficiently!

3

Input and output devices

What components make the computer hardware?

Input and output devices

- **The computer system is divided up into input and output devices**
- **Input devices**
  - These are devices used to send information into your computer
- **Output devices**
  - These devices are used to retrieve information from your computer.
  - These are components where informations come out from the computer

Let's takes some examples of input and output devices

Input devices

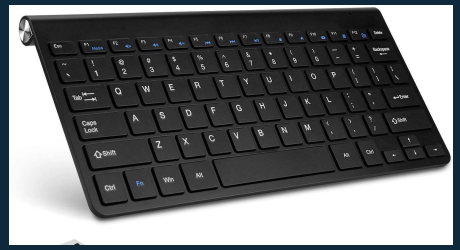
Sending information into the computer

Input and output devices

- **The basic input devices we often have on our computers are:**

The keyboard

To input data by typing



The mouse

Input data by clicking

The webcam

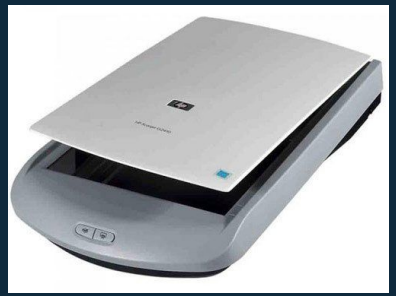
Input photo and video streams

Input and output devices

- **We also have:**

The Scanner

To convert physical to digital document



The microphone

To input sounds in the computer

Output devices

Components where informations come out from the computer

Input and output devices

- **The basic output devices we often have on our computers are:**

The monitor

To display informations to the user

The printer

To transform digital to physical document by printing them

The speakers

To output sounds from the computer

Input and output devices

“ Nowadays, there is a big variety of input and output devices we can plug and use on our computer and more of them are invented daily! ”

*“ This is basically all about the **Hardware**. But to be able to use a computer system, **Softwares** are required!*

*We mostly talk of the **operating system** (Windows, Linux, Mac OS systems) and the **applications** (games, antivirus, Word processing softwares, Spreadsheets etc.) ”*

Thanks!

Any questions?

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