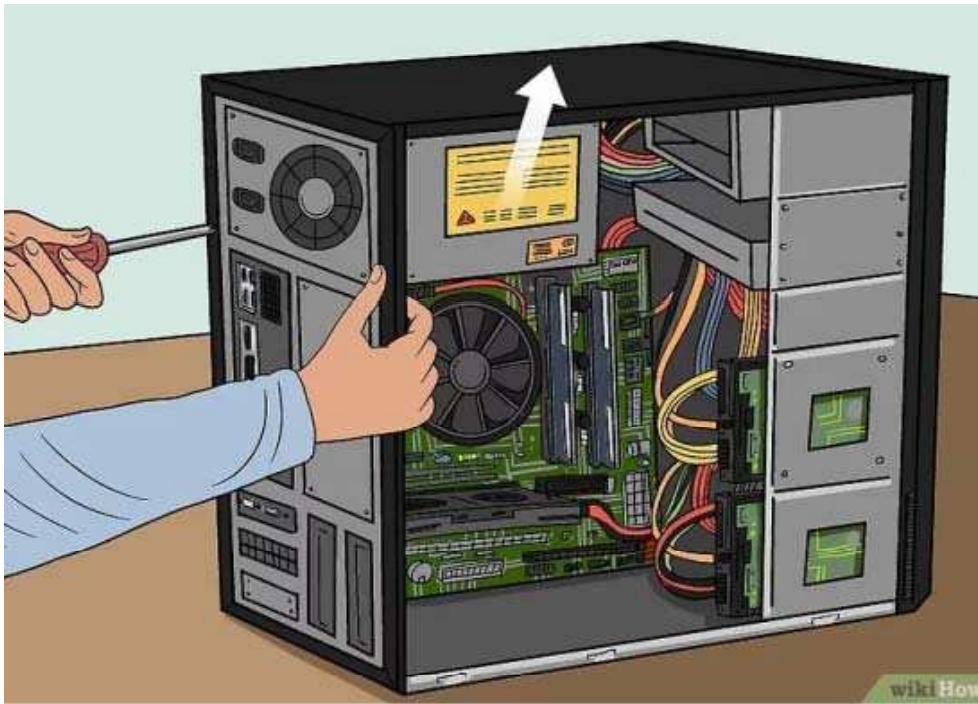# Lesson 3: Components of the Central Processing Unit
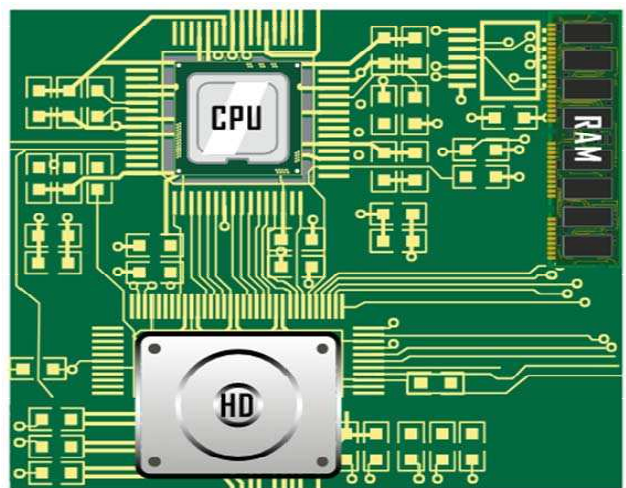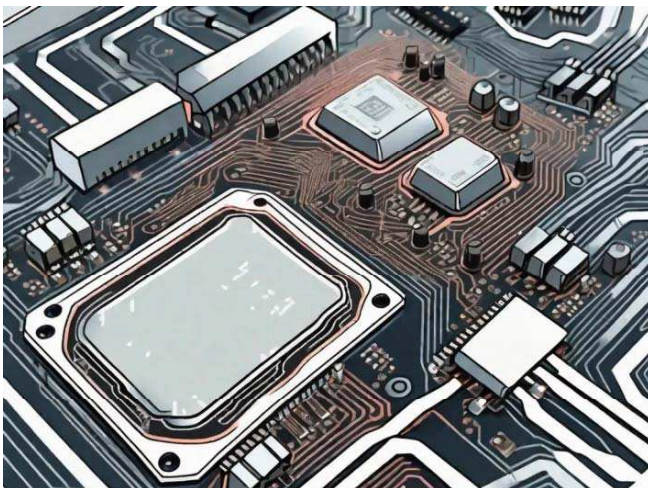

| 1) System buses | They enable data transfer between the various components of the computer and its peripherals. |

There are two types of buses:

1.1) The internal bus or Front Side Bus (FSB)

It connects the components of the motherboard, such as the microprocessor to the chipset and the chipset to the RAM.
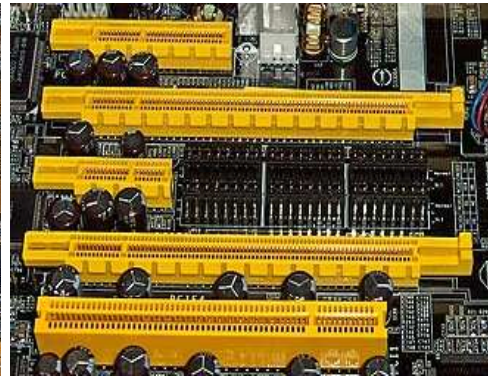
There are three types

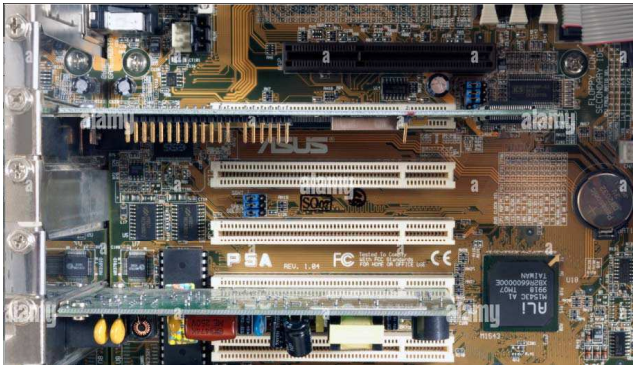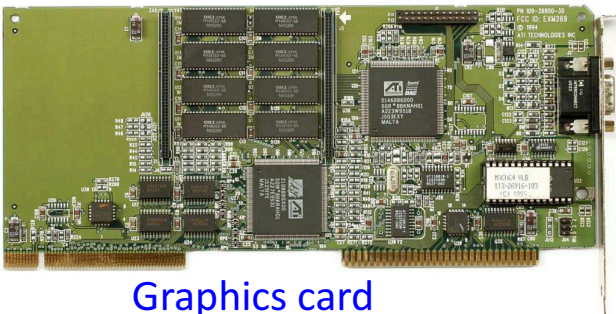## a) The PCI (Peripheral Component Interconnect) interface

Ports PCI

Ports PCI Express

It allows expansion cards to be connected to a computer's motherboard. One of the advantages of the PCI bus is that two PCI cards can communicate with each other without going through the processor.
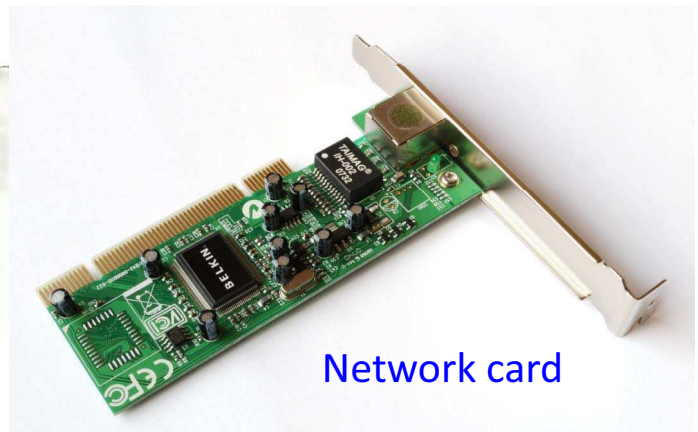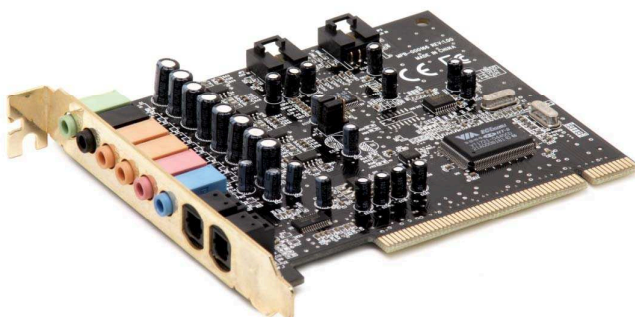

Internet expansion card

Examples of PCI connection cards

Graphics card

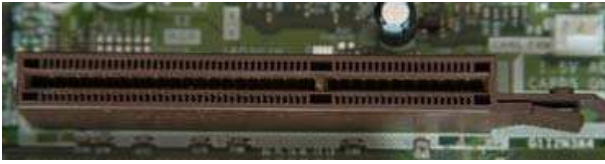Network card

Sound card

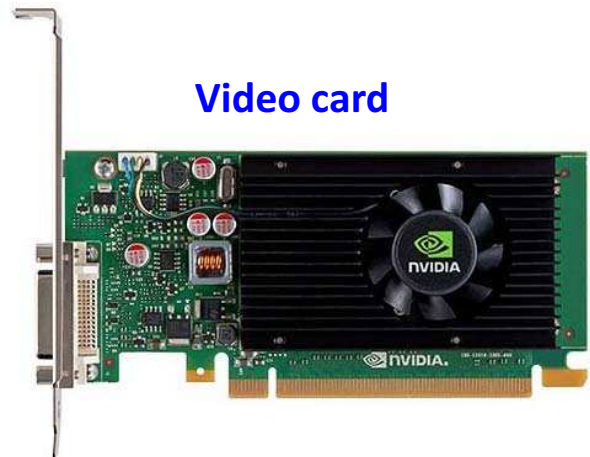WiFi card

b) Accelerated Graphics Port (AGP) is a parallel expansion card standard
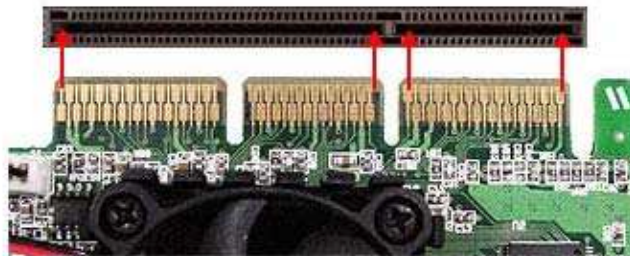
It is designed to add a video card to a computer system to assist with 3D graphics acceleration.
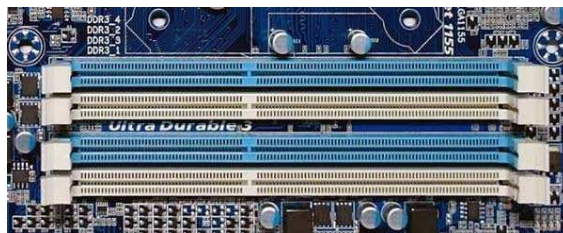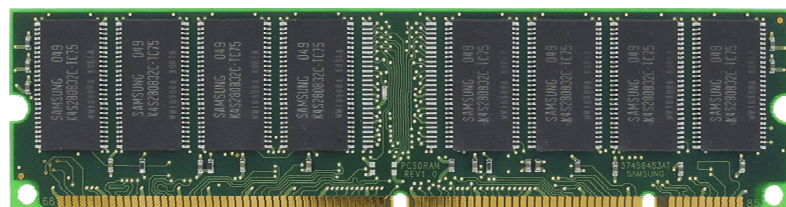
Port AGP

Video card

Video card location

C) SDRAM port The reference design for the parallel port SDRAM controller
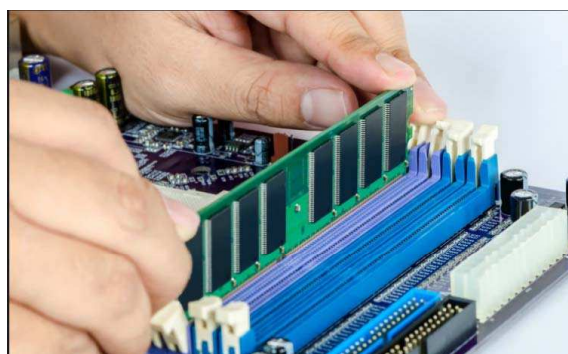
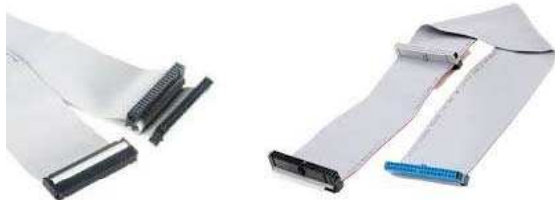**SDRAM port**

SDRAM card

SDRAM card location

SDRAM port

1.2) the expansion bus (input/output bus)

It connects the microprocessor to the input/output connectors and expansion connectors.

There are two types:

a) The IDE cable connects the motherboard to the hard drives or the drive/burner.
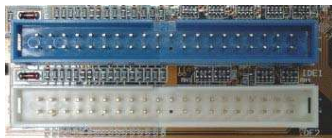
Connecting an IDE cable to the central processing unit

IDE Flat Cable + Connector

IDE port

Disque IDE

De 1980 à 2000

Nappe IDE
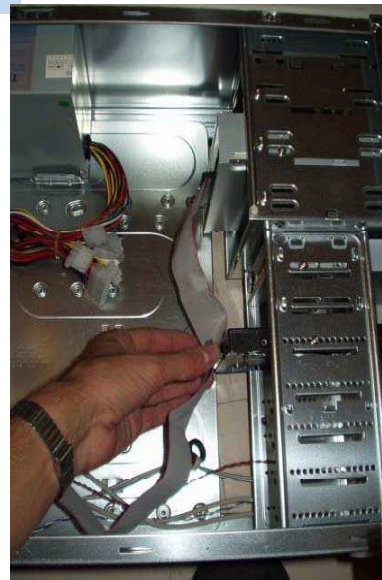
b) The SATA connector (Advanced Technology Attachment) ou S-ATA)

It allows any device compatible with this standard (hard drive, DVD drive, etc.) to be connected to a motherboard.
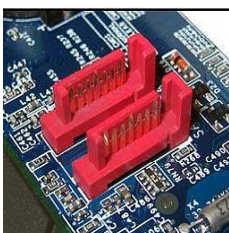
Port SATA

SATA Flat Cable + Connector

Flat SATA Cable + Right Angle Connector

Disque SATA

De 2000 à aujourd'huis

Nappe SATA

2) The processor or microprocessor (CPU)

2.1) Definition

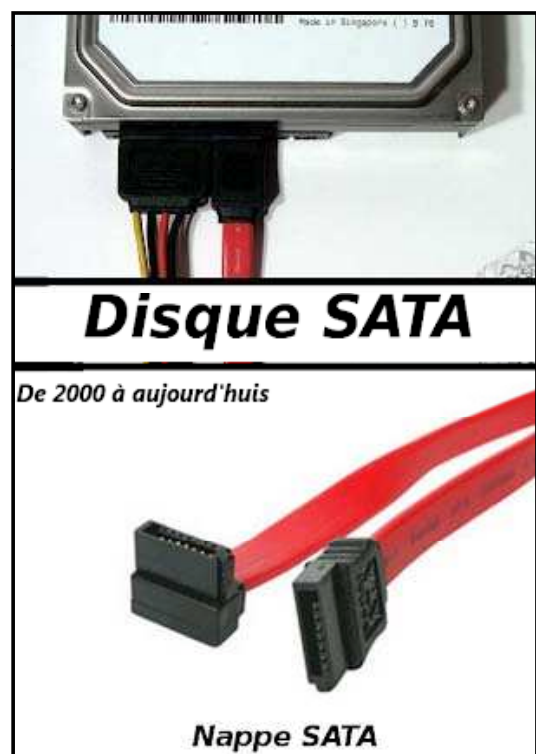The processor is a chip (a highly complex integrated circuit) measuring approximately 4 cm square and a few millimeters high.

It is the central processing unit (CPU) or "Central Processing Unit" (CPU).

It is the brain of the computer. It enables the computer to perform the requested operations (calculations).

The most common processor models are AMD and Intel.
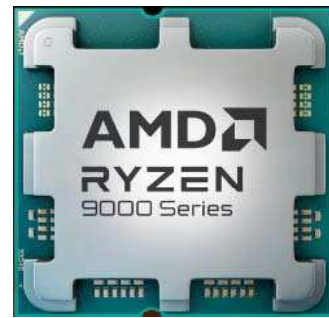
2.2) Operation

The processor gets very hot because it is working very hard. It is covered with a heat sink: thin metal fins that capture the heat emitted by the processor. Above the heat sink is a fan that removes this heat.

Ventilateur

Radiateur

Processeur

2.3) Processor types and speeds

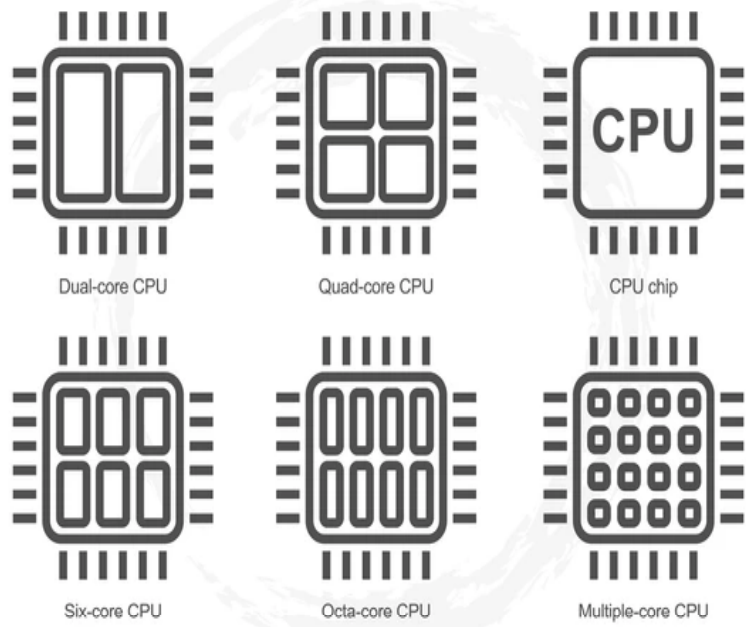When several processors are combined, we refer to a processor composed of several cores.

Dual-core CPU   Quad-core CPU   CPU chip

Six-core CPU   Octa-core CPU   Multiple-core CPU
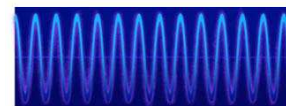
The speed (frequency) at which a processor performs calculations is called the "clock speed" and is measured in gigahertz (GHz = 10^9 Hz). It can exceed 3 GHz (GHz = billion cycles per second).

Intel® Core™ i9-13900K
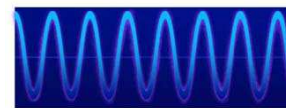
3.00 GHz
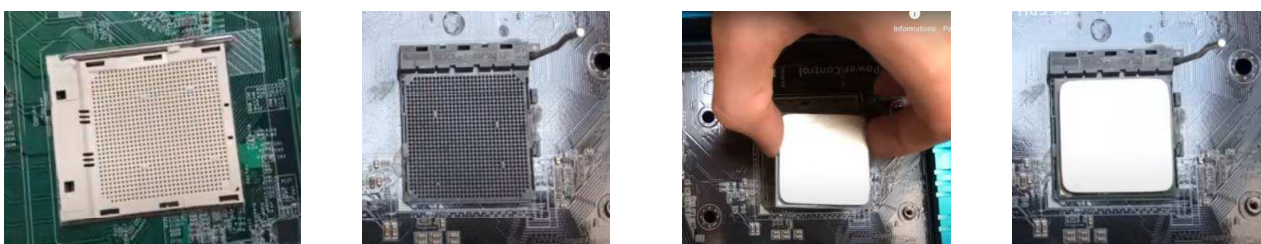(Performance Core™ base frequency)

5.80 GHz
(Max Turbo frequency)

2.4) Processor location

Socket

Socket Intel

Socket AMD

3) Memory

There are three types of computer memory:

a) Read-only memory is called ROM. It is a read-only memory. It is used to store data necessary for starting up the computer (BIOS, startup instructions, microcode). It is not erased when the system is turned off.

b) Temporary memory or random-access memory (RAM). This memory stores calculations and information for a defined period of time. This information no longer exists once the computer is turned off.
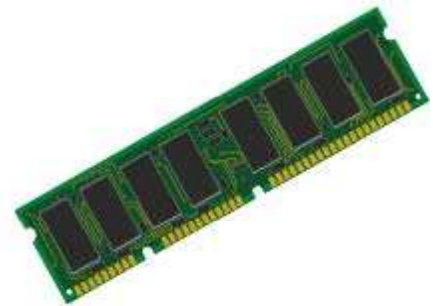
c) Internal memory: This is "usable" memory that can be read and written to, and can store data such as photos, video clips, music files, documents, etc. for long periods of time.


d) External memory: This stores data outside of a computer or other digital devices. It provides additional space for storing files, documents, media, and other types of data.

4) Chipsets

The chipset is an electronic circuit that manages communications between the processor and the components connected to the computer's motherboard (RAM, graphics card, hard drive, etc.) as well as external peripherals.
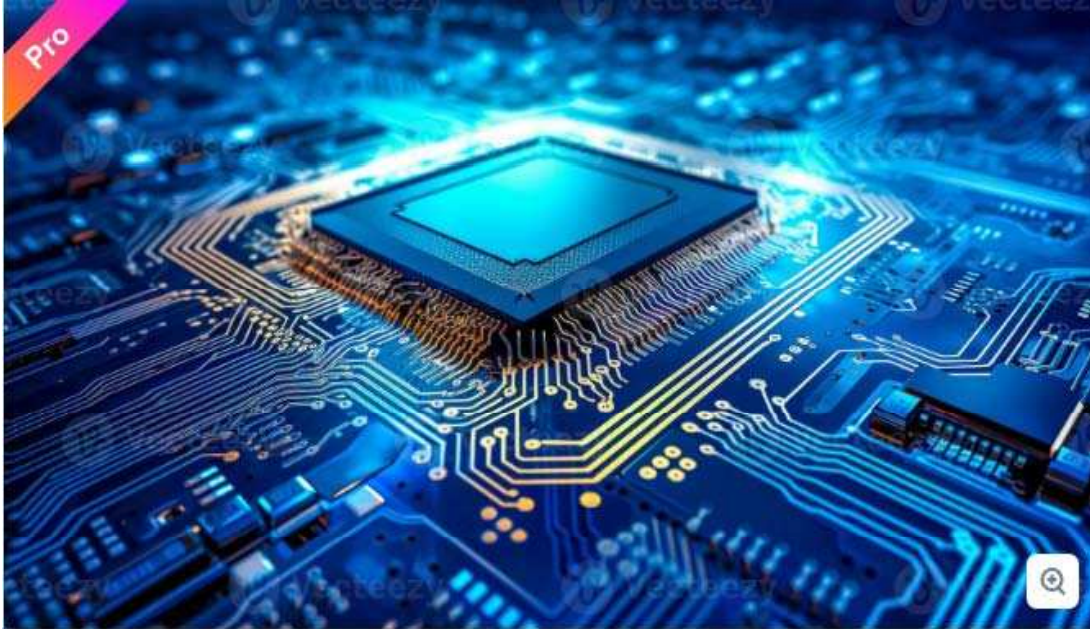
There are two chipset architectures: Northbridge and Southbridge.

The Northbridge chip manages communications between the processor and fast peripherals such as RAM, the graphics card, and the Southbridge (via an internal bus). The Northbridge is directly connected to the processor.

The Southbridge chip manages communications with input/output devices (IDE, SATA, USB, Ethernet, etc.). Apart from the monitor, all devices connected to your PC pass through this chip.
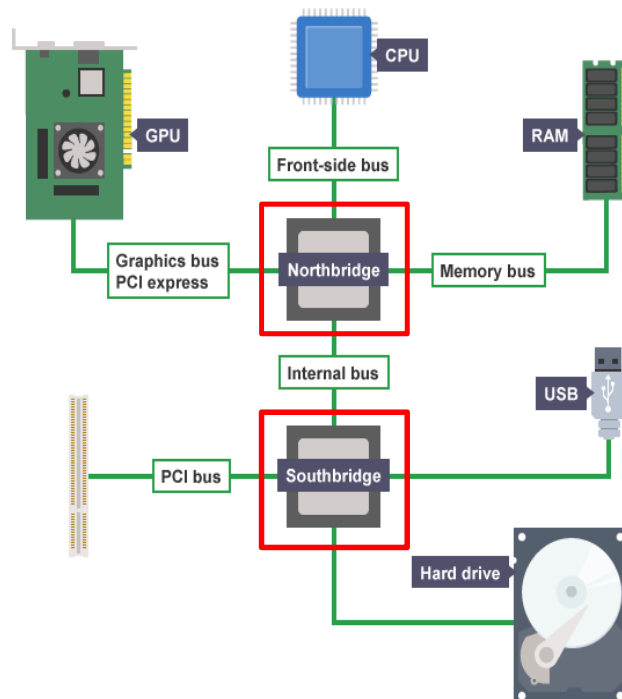
End of Lesson 3

Thank you for your attention!