Application of Information & Communication Technologies

Lecture-4

Recap of Lecture 3

- System Unit
  - Digital Data & Program Representation
  - Bits & Bytes
  - Numbering Systems
    - Decimal & Binary
  - Coding System

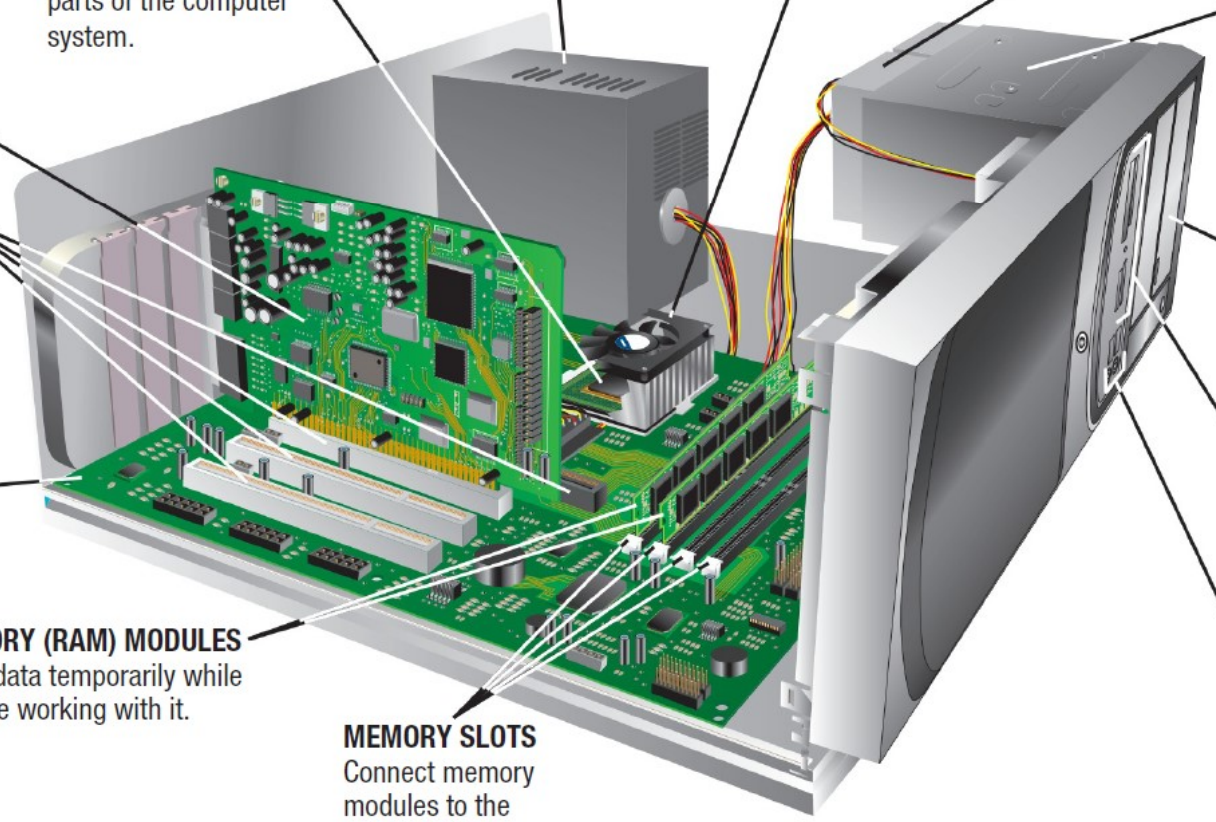
Overview of Lecture 4

- Inside System Unit
  - The Motherboard
  - Power Supply
  - Drive Bays
  - Processors
  - Memory
  - Cooling Components
  - Expansion Slots & Cards
  - Buses
  - Ports & Connectors

What is the System Unit?

- Main case/box of the computer.
- Holds CPU, memory, storage, power supply, ports.
- Works as the central body of the computer.

What is the System Unit?



CPU
Performs the calculations and does the comparisons needed for processing, as well as controls the other parts of the computer system.

POWER SUPPLY
Converts standard electrical power into a form the computer can use.

FAN
Cools the CPU.

HARD DRIVE
Stores data and programs; the principal storage device for most computers.

EXPANSION CARD
Connects peripheral devices or adds new capabilities to a computer.

DRIVE BAYS
Hold storage devices, such as the DVD and hard drives shown here.

EXPANSION SLOTS
Connect expansion cards to the motherboard to add additional capabilities.

DVD DRIVE
Accesses data stored on CDs or DVDs.

MOTHERBOARD
Connects all components of the computer system; the computer's main circuit board.

FLASH MEMORY CARD READER
Accesses data stored on flash memory cards.

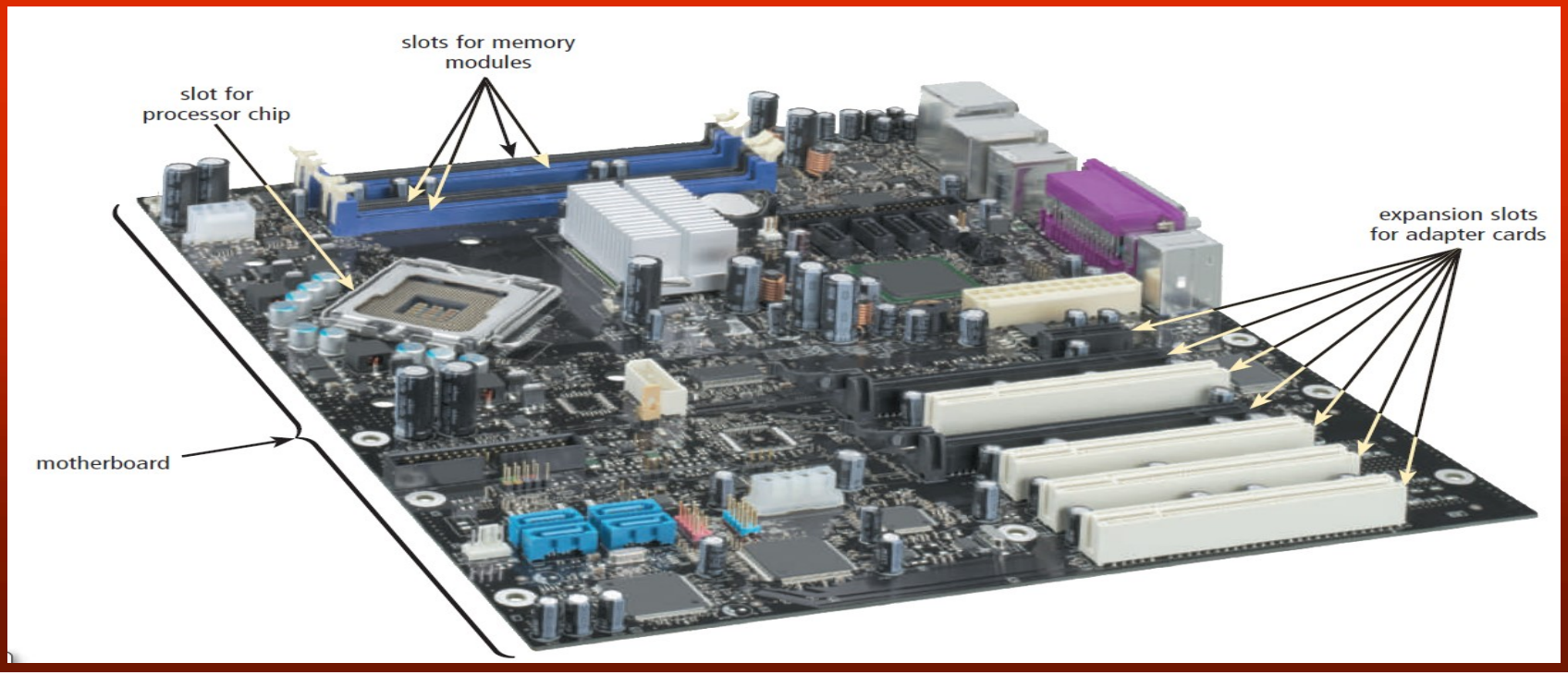
MEMORY (RAM) MODULES
Store data temporarily while you are working with it.

MEMORY SLOTS
Connect memory modules to the motherboard.

USB PORTS
Connect USB devices to the computer.

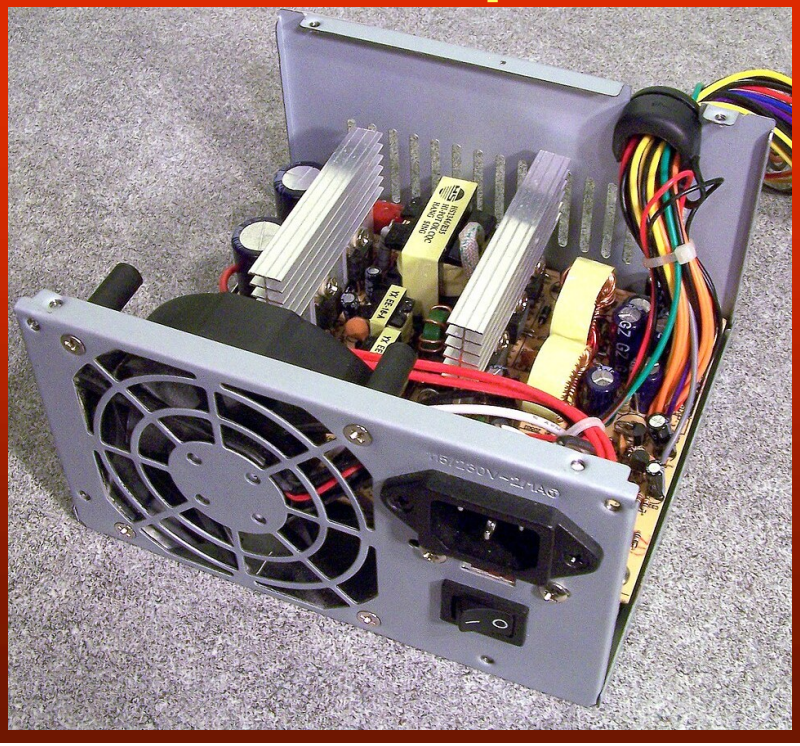
The Motherboard

- Largest circuit board.
- Connects all components.
- Holds: CPU socket, RAM slots, expansion slots, chipset.



Power Supply

- Power Supply Unit (PSU): Converts (AC) wall electricity → usable computer power (DC).
- Includes cooling fan (sometimes variable speed).
- Some peripherals use external AC adapters (e.g., printer, modem).



Drive Bays

- A drive bay = a rectangular opening in the system unit.
- It usually holds:
  - Hard disk drives (HDDs)
  - Solid-state drives (SSDs)
  - Optical drives (CD/DVD/Blu-ray)
- External bays = you can see and access from outside (e.g., CD/DVD drive slot, card reader).
- Internal bays = hidden inside, for HDD/SSD.

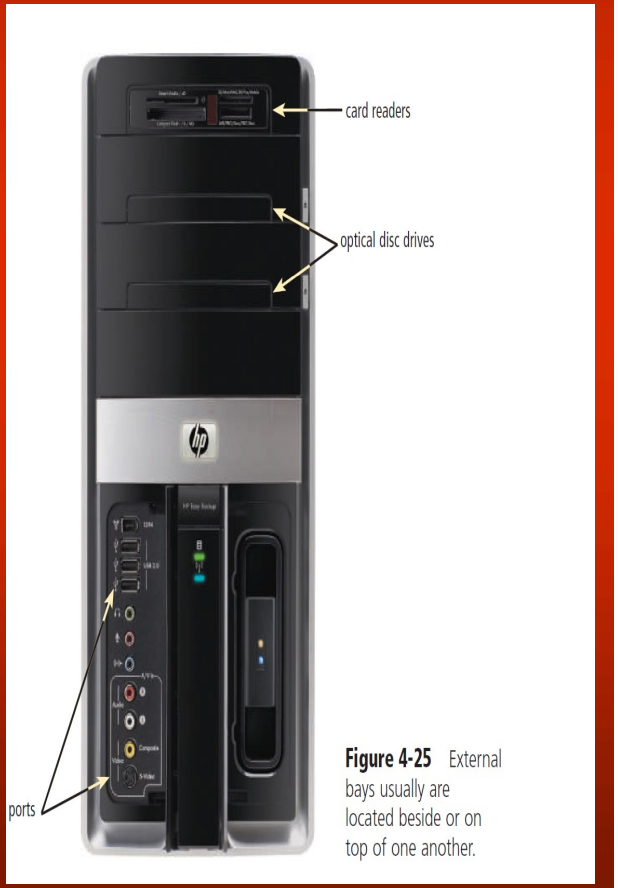


Figure 4-25 External bays usually are located beside or on top of one another.

Processors

- CPU (Central Processing Unit): The "brain" of computer.
- Handles instructions & calculations.
- Multi-core → many tasks at once.
- GPU (Graphics Processing Unit): For graphics, gaming, AI.

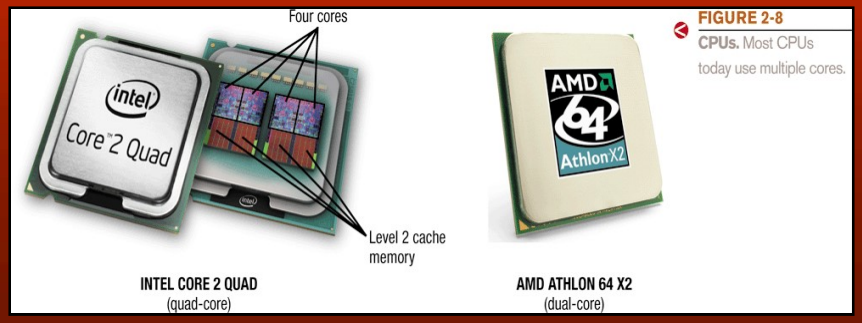


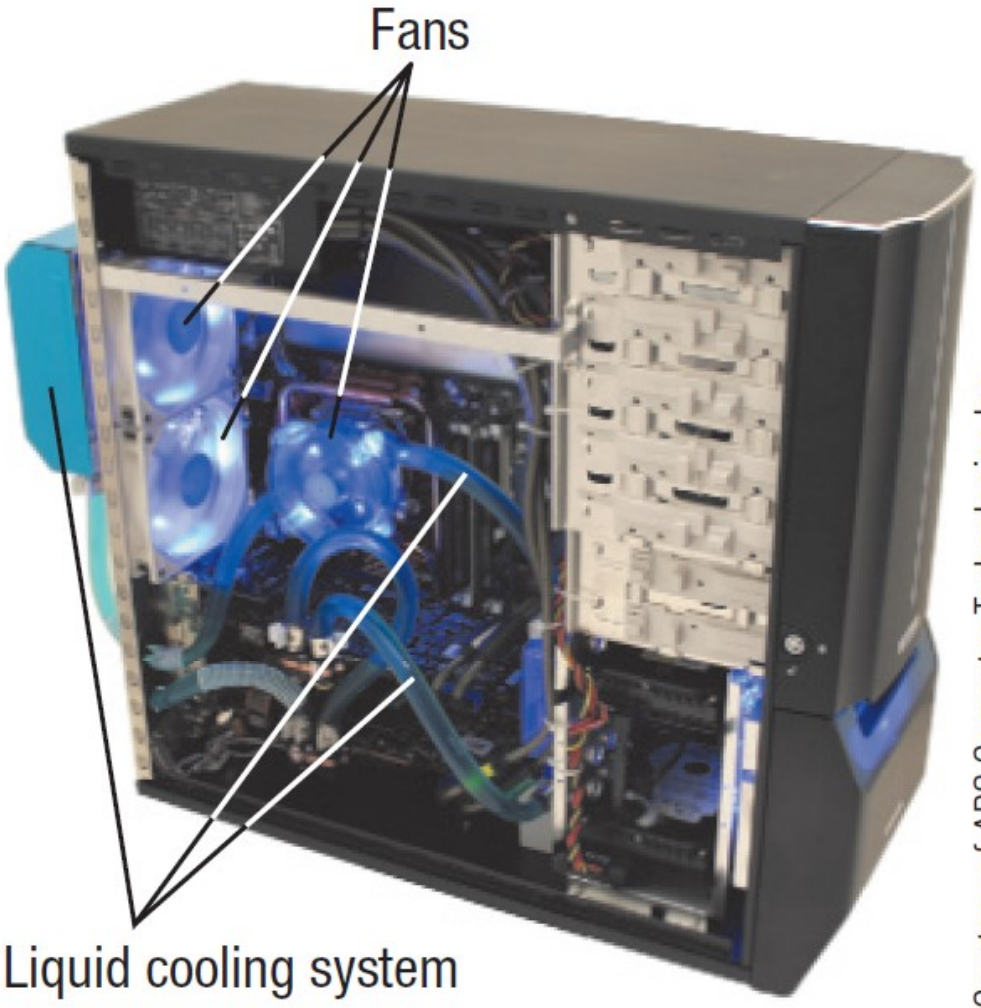
FIGURE 2-8
CPUs. Most CPUs today use multiple cores.

Memory

- RAM (Temporary, fast).
- ROM (Permanent, startup instructions).
- Cache (Very fast, close to CPU).
- Flash (USB, SSD).

Cooling Components

- Computers generate heat.
- Cooling methods: Fans
- Heat sinks
- Liquid cooling (advanced PCs).



Liquid cooling system

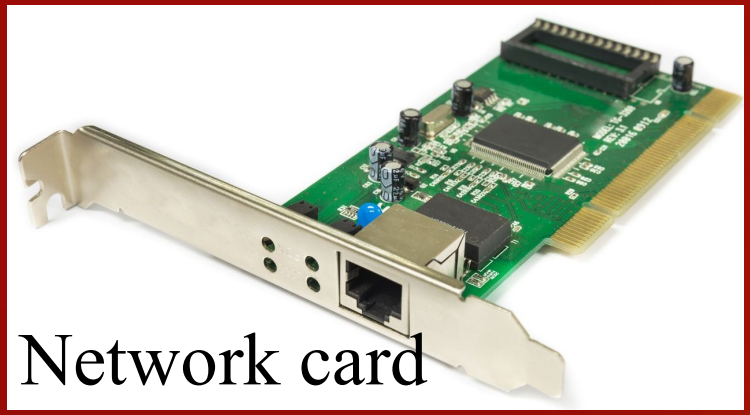
Courtesy of ABS Computer Technologies Inc.

DESKTOP COMPUTERS

Can use fans, heat sinks, and liquid cooling systems to cool the inside of the computer.

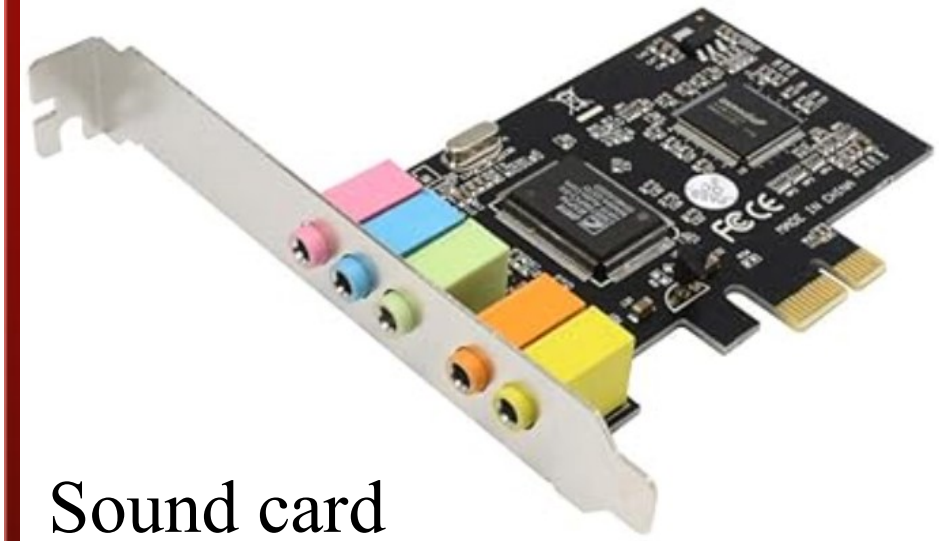
Expansion Slots & Cards

- Slots on motherboard → add functionality.
- Examples:
  - Graphics card
  - Sound card
  - Network card



Network card

Wireless Network cards



Sound card

Graphics card

Drive Bays vs Expansion Slots & Cards

Feature	Drive Bays	Expansion Slots
Location	In the system unit case	On the motherboard
Purpose	Hold **storage devices**	Add new **functionality**
Type	Rectangular **openings**	Connector **slots**
Example	Hard drive, SSD, Optical disc drive, Card reader	Graphics card, Sound card, Network card

Buses

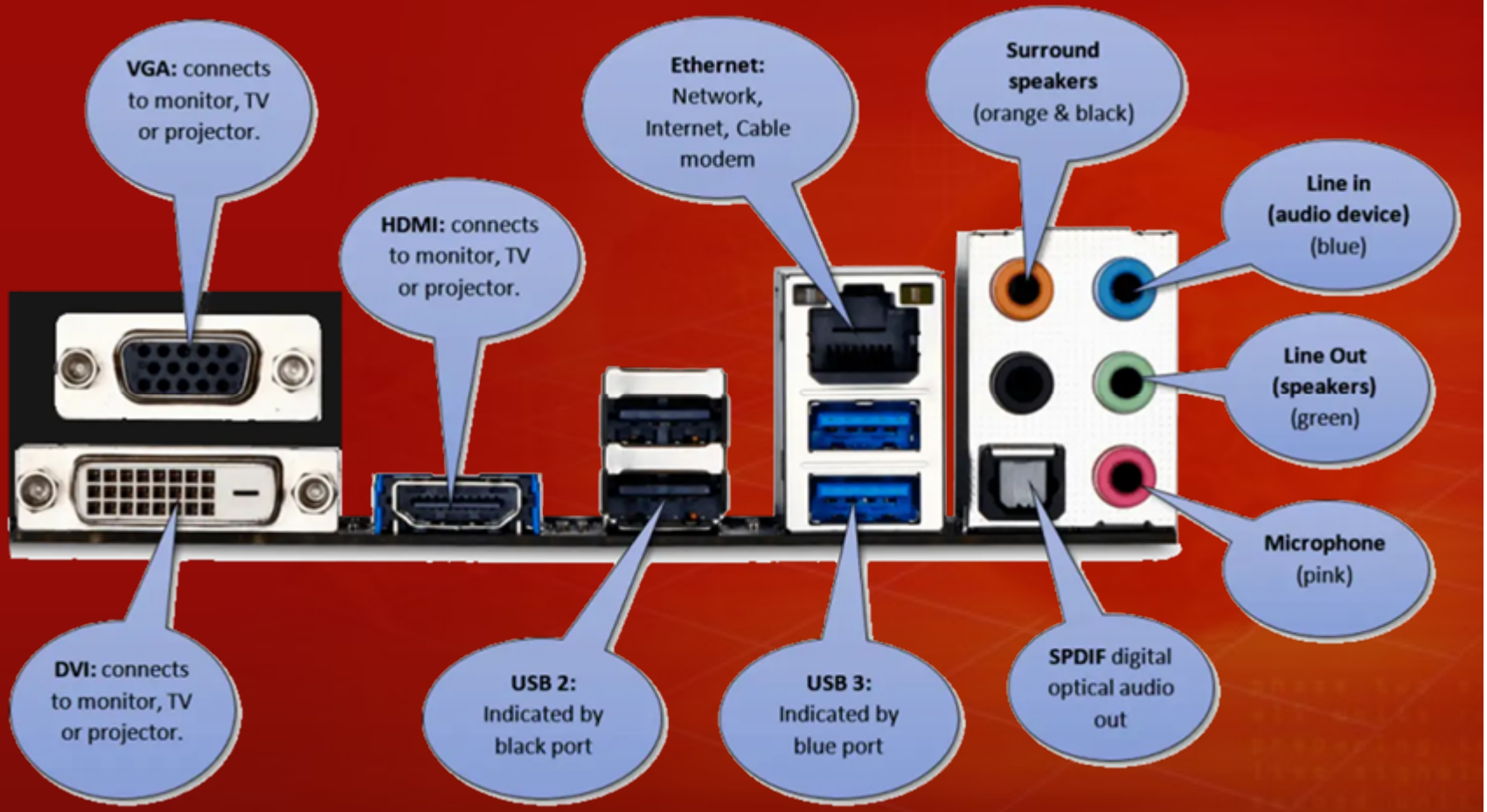
- Highway for data inside computer.
- Types:
  - Data Bus → moves data.
  - Address Bus → tells location.
  - Control Bus → manages signals.

Ports & Connectors

- Port: Physical interfaces that allow devices to connect to a computer and facilitate data transfer, and communication.

- USB: keyboard, mouse, flash drive.
- HDMI/VGA: monitor.
- Ethernet: Internet.
- Audio ports: headphones, speakers.

Ports & Connectors



Summary

- Inside System Unit
  - The Motherboard
  - Power Supply
  - Drive Bays
  - Processors
  - Memory
  - Cooling Components
  - Expansion Slots & Cards
  - Buses
  - Ports & Connectors

Suggested Reading

- Ch-02, The System Unit: Processing and Memory , “Understanding Computers: Today and Tomorrow, Comprehensive”, 15th Edition by Deborah Morley & Charles S. Parker
- Ch-04, Discovering Computers Fundamentals- Your Interactive Guide -- Gary B Shelly; Misty E Vermaat; Jeffrey J Q