JS2 - NETWORK TOPOLOGIES

Meaning of Network Topology

Network topology refers to the **arrangement or layout of computers and other devices in a network** and how they are connected to one another.
Three common ones are:

1. **Bus Topology**
2. **Star Topology**
3. **Ring Topology**

Bus Topology

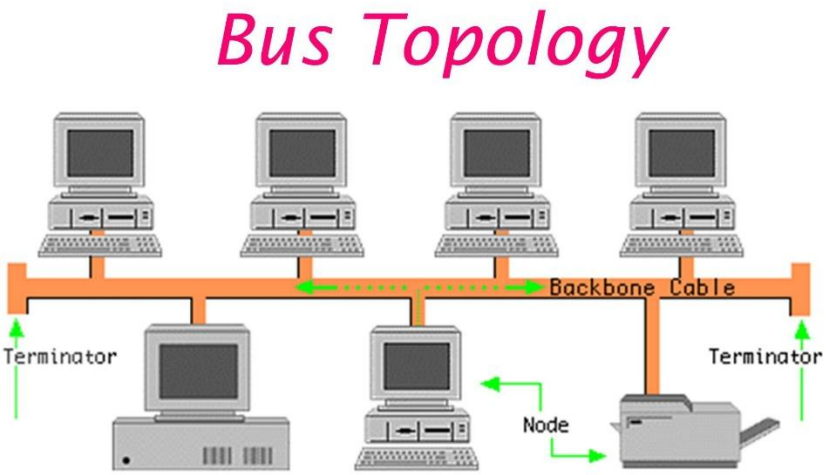
A **bus topology** is a network arrangement in which all computers and devices are connected to a **single main cable**, called the **backbone**.
The devices share the same communication line.

Advantages of Bus Topology

- It is **simple to install**.
- It requires **less cable** than some other topologies.
- It is relatively **cheap** to set up.
- It is suitable for **small networks**.
- Adding a device can be relatively easy.

Disadvantages of Bus Topology

- If the **main cable fails**, the entire network can stop working.
- Performance becomes slower when **many devices** are connected.
- Finding faults can be difficult.
- There is a limit to the number of devices that can be connected effectively.
- Data collisions can occur when several devices transmit data at the same time.



Star Topology

A **star topology** is a network arrangement in which all computers and devices are connected to a **central device**, such as a **switch or hub**.
The central device controls communication between the connected devices.

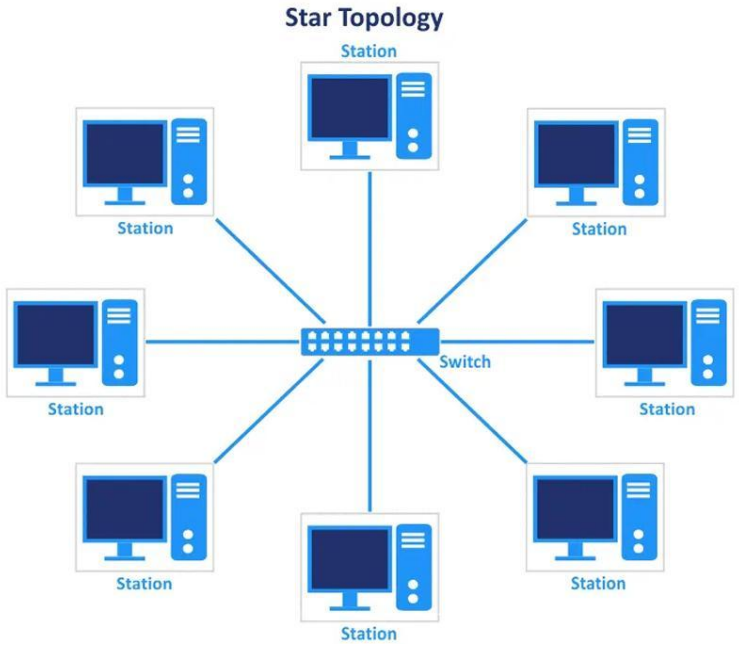
Advantages of Star Topology

- It is **easy to install and manage**.
- If one cable or computer fails, the **other devices can continue working**.
- It is easy to **identify and fix faults**.
- Devices can be added or removed easily.
- It provides good network performance.

Disadvantages of Star Topology

- If the **central switch or hub fails**, the entire network may stop working.
- It requires **more cable** than a bus topology.

- It can be more **expensive** to install.
- It depends heavily on the central device.



Ring Topology

A **ring topology** is a network arrangement in which each device is connected to **two other devices**, forming a closed **circle or ring**.
Data travels around the ring from one device to another until it reaches its destination.

Advantages of Ring Topology

- Data can travel in an **orderly manner**.
- There is less chance of data collisions.
- All devices have an opportunity to transmit data.
- It can provide consistent network performance when there are many devices.

Disadvantages of Ring Topology

- If one device or connection fails, it can **affect the entire network**.
- Adding or removing a device can be difficult.
- Finding faults can be challenging.
- It can be slower because data may need to pass through several devices before reaching its destination.

