Computer Network Topology: What It Is and Types
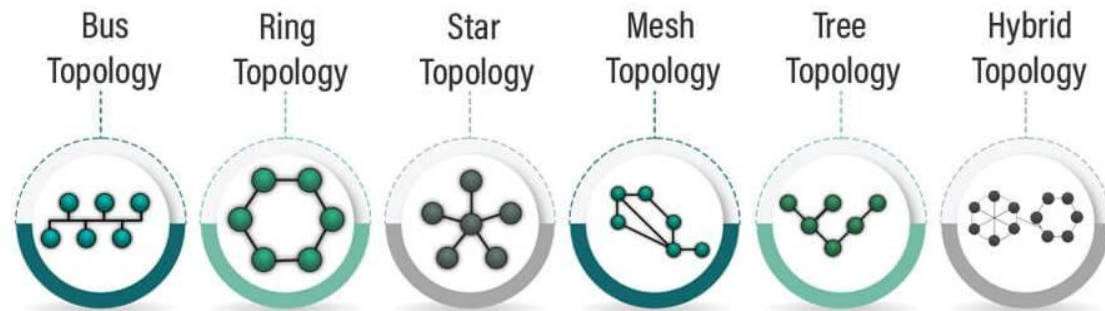
Definition of Topology

Topology is the logical and physical structure of the network.

There are several network topologies which few as follows:

- **Point to Point Topology**
- **Mesh Topology**
- **Star Topology**
- **Bus Topology**
- **Ring Topology**
- **Tree Topology**
- **Hybrid Topology**

What is Point-to-Point Topology?

Point-to-point topology is the direct connection between two devices or two sites. This is the simplest network topology, where two nodes are dedicated to connecting. This topology is expensive but very fast and uses full bandwidth. One of its disadvantages is that if the connection breaks between them, the whole network will be down. It is required in small setups where fewer nodes are needed.
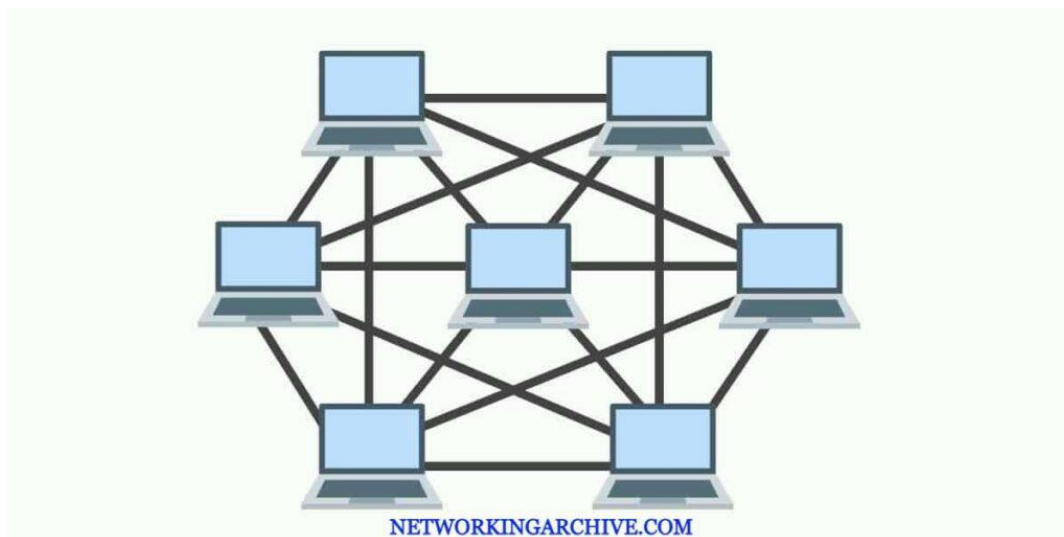
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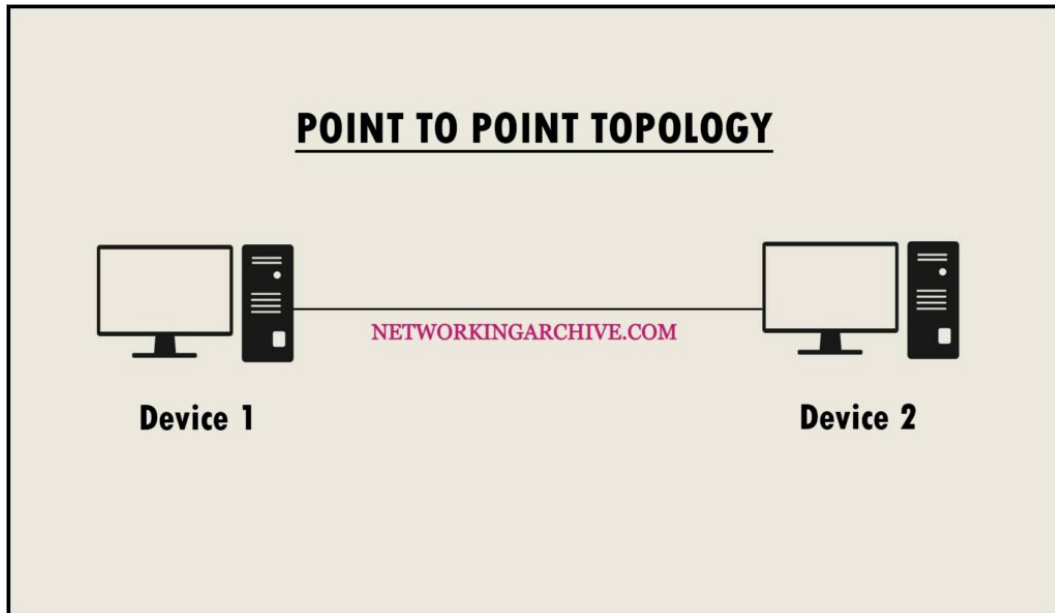
What is Mesh topology?

In this topology, each device is directly connected to all other devices instead of connecting to a centralized switch or server. One of the main disadvantages is that if one device is damaged, it can impact the entire network. Additionally, it is a very expensive setup.
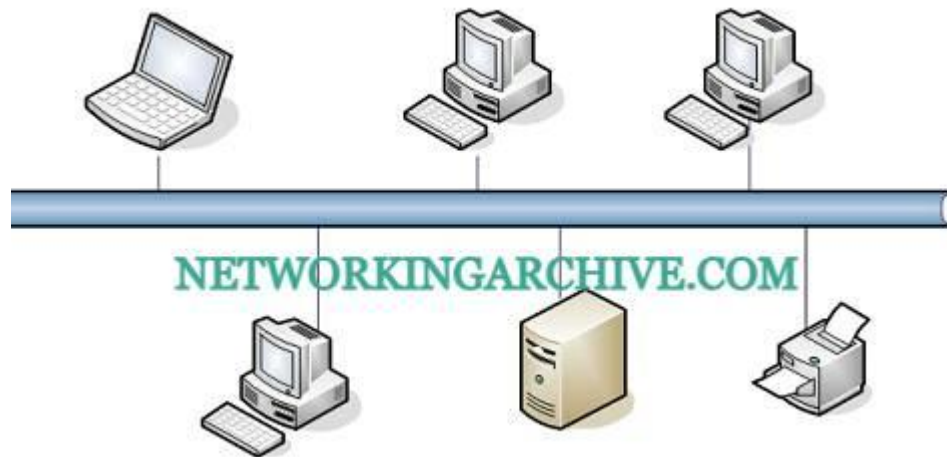
Diagram:

What is Bus Topology?

In bus topology, all devices are connected to a single medium and share communication. In the modern era, this topology is not often used. There is a single point of failure; if the medium is

cut, all communication will be disconnected. It is used with coaxial cables, such as thinnet or thicknet.

Diagram:

What is Star Topology?

In a star topology, all devices connect to a centralized hub or switch in point-to-point connections. It is widely used in LAN network scenarios. In a hub device, there is no mechanism for forwarding traffic; it sends out data on all ports, including the one where the data originates. A switch is a more intelligent device that controls traffic based on MAC address tables and makes decisions on routing traffic. In a switch, data is sent to all ports except the one where the data originated.
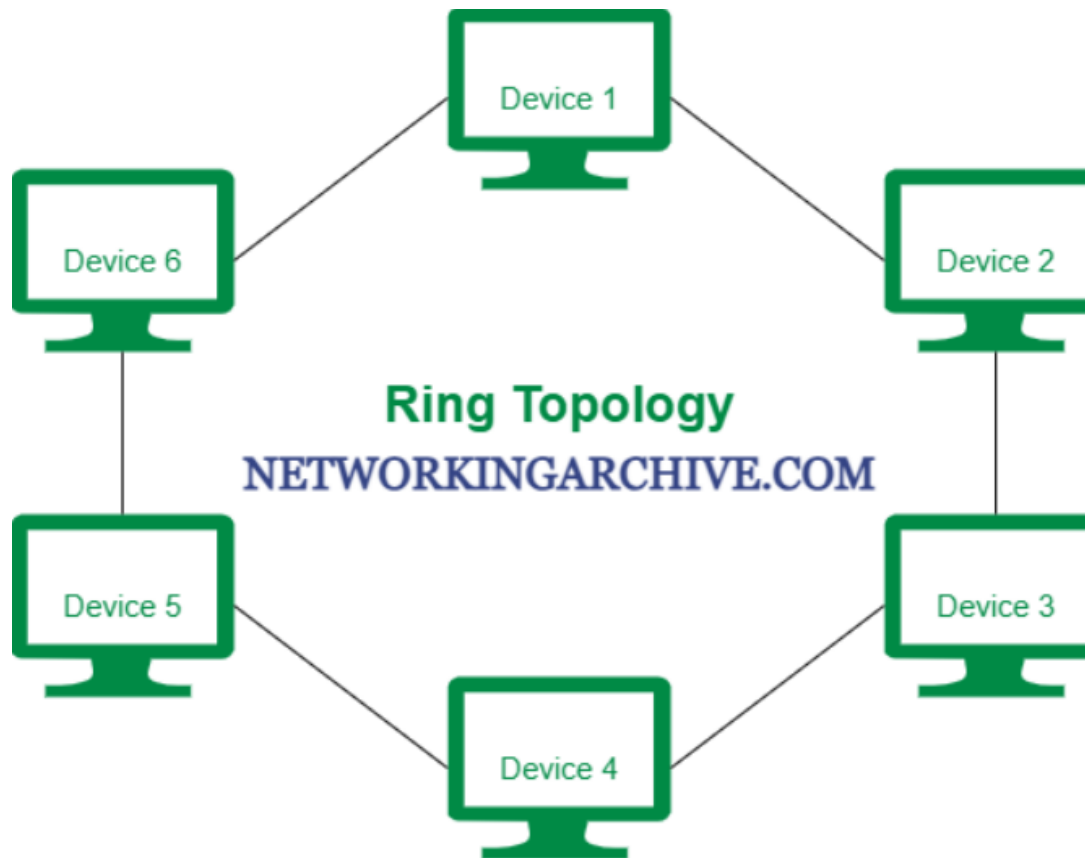
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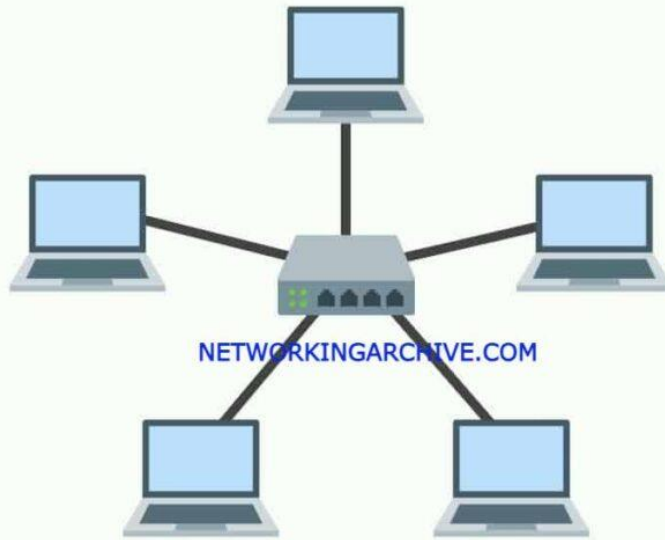
What is Ring Topology?

In a ring topology, all devices are connected circularly, with each device connected to others. It is a relatively expensive method because data must pass through all devices; if one device is damaged, all other traffic will be halted.
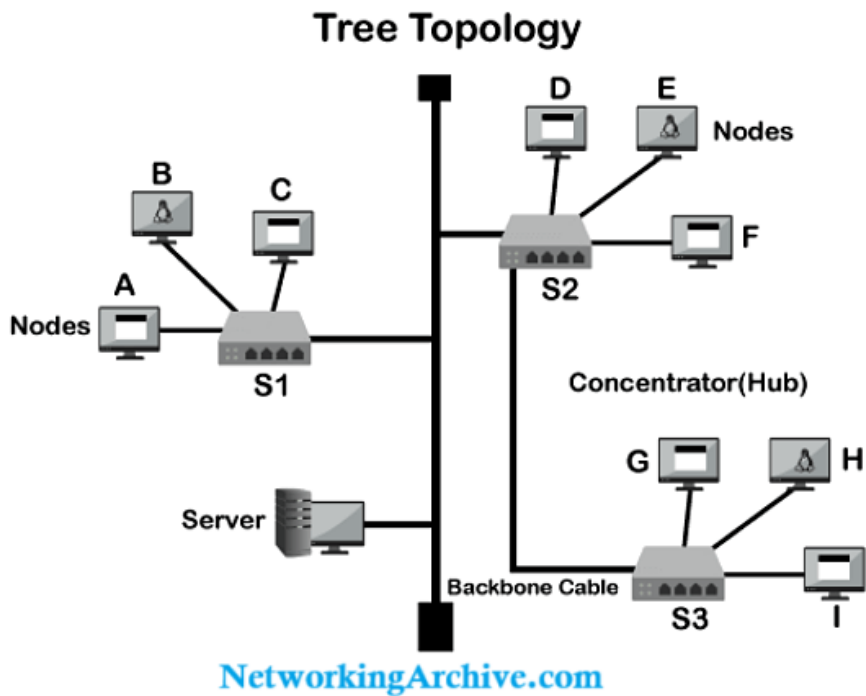
Diagram:

Ring Topology
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What is Tree Topology?

In tree topology, devices are organized in a hierarchical structure, with links and nodes connected systematically. A tree topology combines bus and star topologies, enhancing scalability, similar to branches connected to a tree. If one node is damaged, it does not affect the rest of the network. However, a significant disadvantage is that it is very difficult to configure.

Diagram:

Tree Topology

What is Hybrid Topology?

The hybrid topology consists of two or more network topologies, mitigating the weaknesses of each topology. It is used in various businesses and schools depending on their requirements.

Diagram: