- Shubham Agrawal

Network Topology

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What is Network Topology?

A computer network is a collection of two or more computers which are connected together to share information and resources.

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Types Of Topology

Based on geographical area covered

- Local Area Network (LAN)
- Metropolitan Area Network (MAN)
- Wide Area Network(WAN)

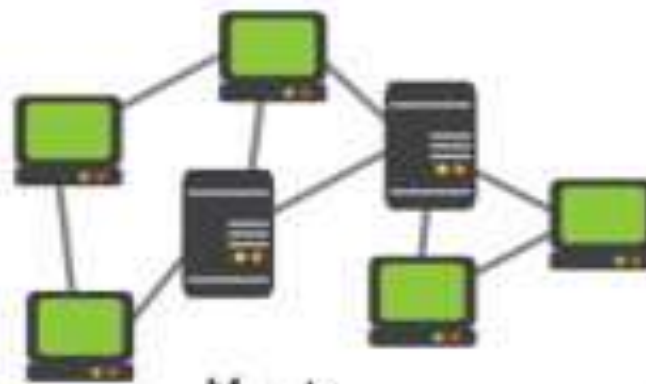**Based on Architecture**

- Bus Topology
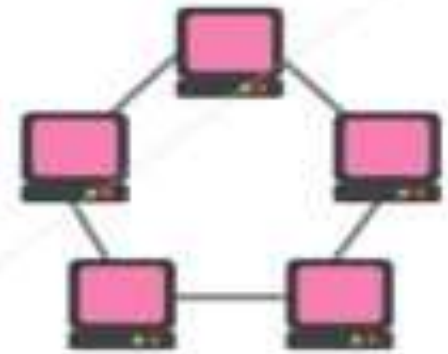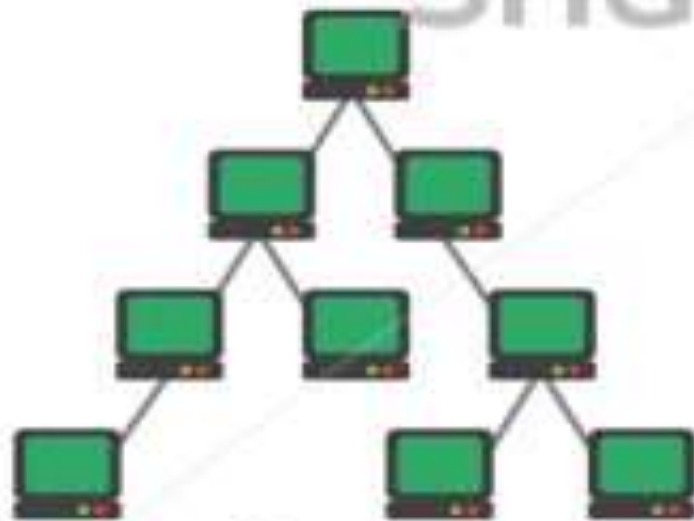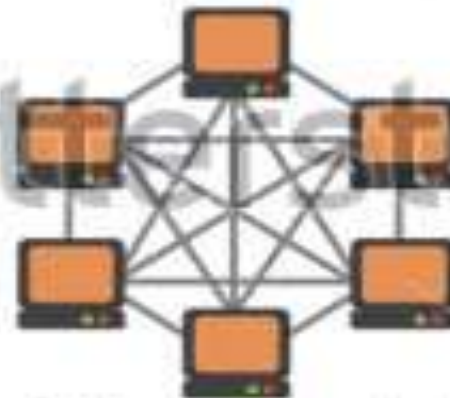- Star Topology
- Ring Topology
- Tree Topology
- Mesh Topology
- Hybrid Topology

Star

Mesh
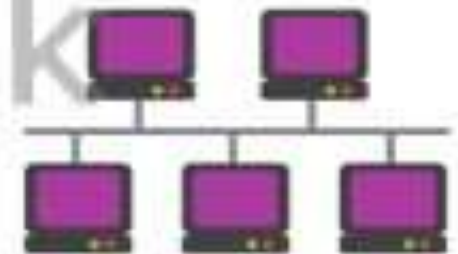
Ring

Tree

Fully Connected

Bus

Line

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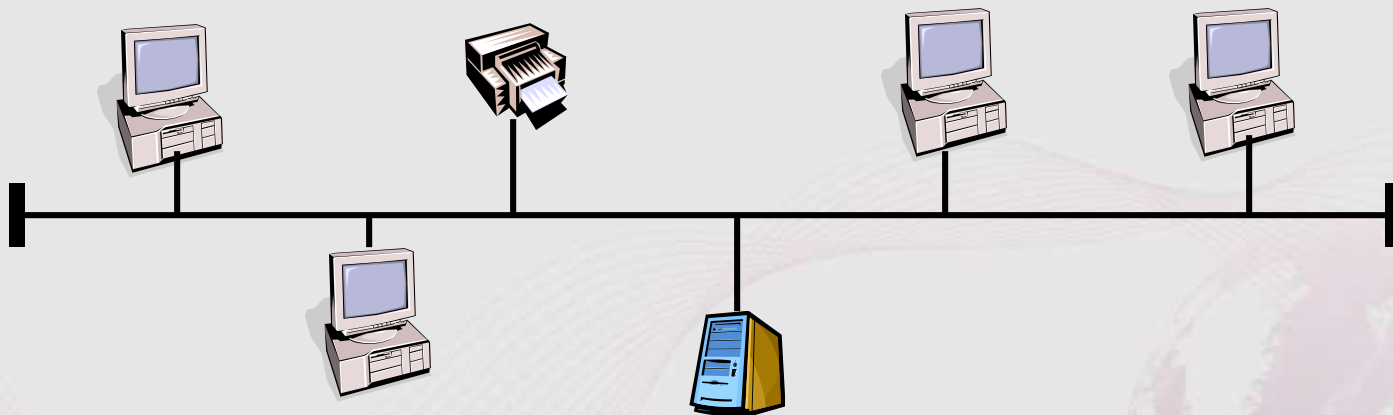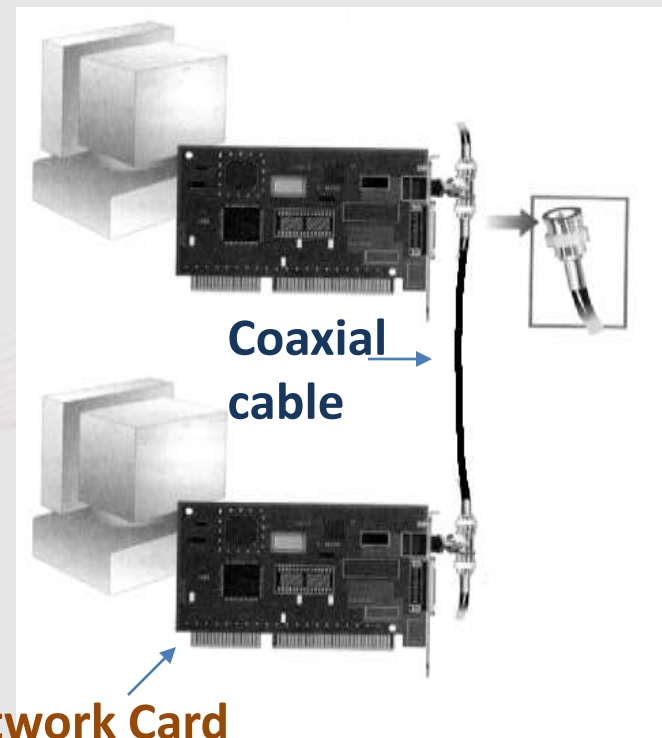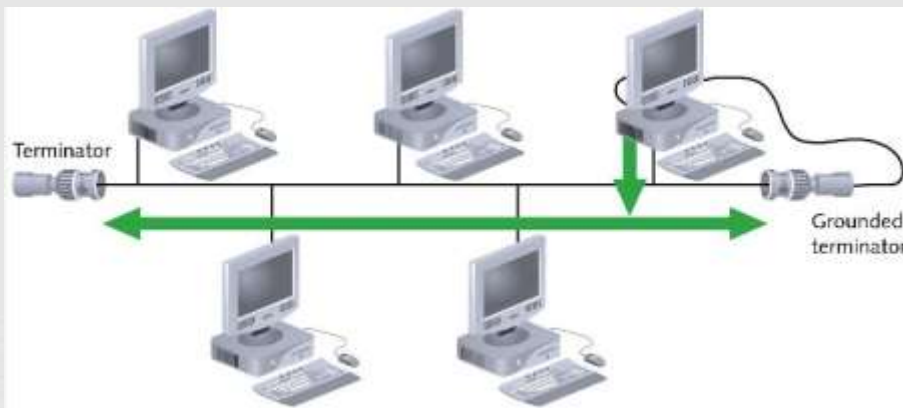
Bus Topology

A **Bus topology** consists of a single cable—called a **bus**— connecting all nodes on a network without intervening connectivity devices

Advantages of Bus Topology

- Works well for small networks.
- Relatively inexpensive to implement.
- Easy to expand joining two cables together.
- Used in small network.

Coaxial cable

Network Card
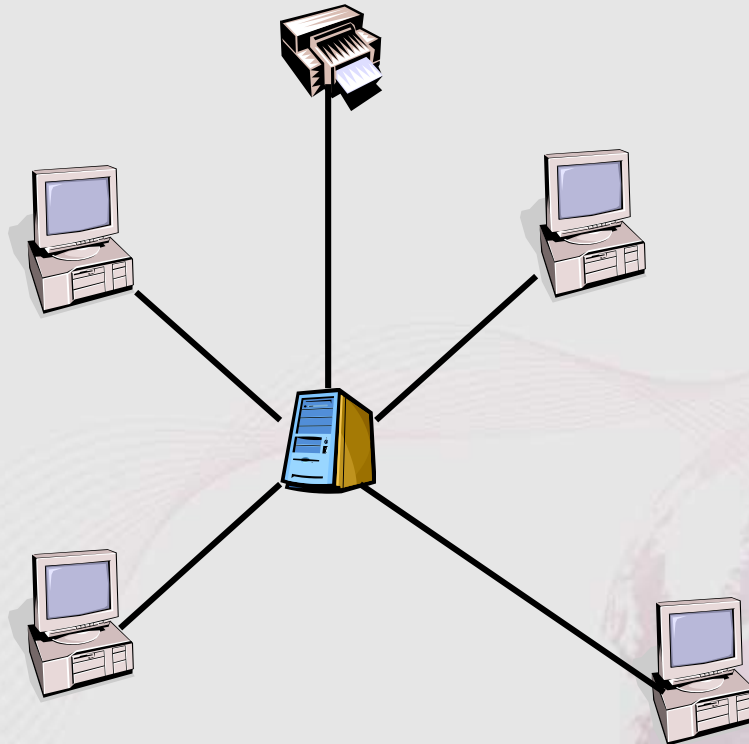
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Disadvantages of Bus Topology

- Management costs can be high
- Cables fails then whole network fails.
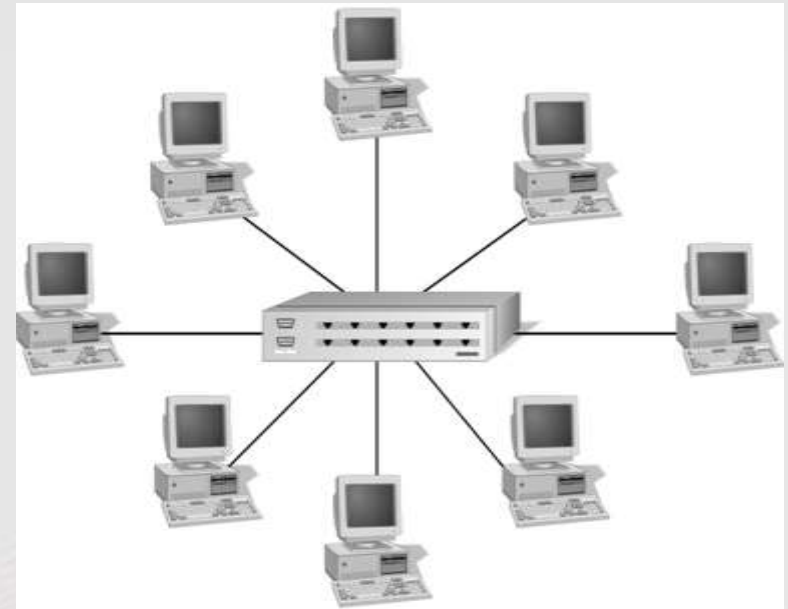- Cables has a limited length.

Star Topology

A star network is   designed with each node (file server, workstation, peripheral) connected directly to a central network hub or server.
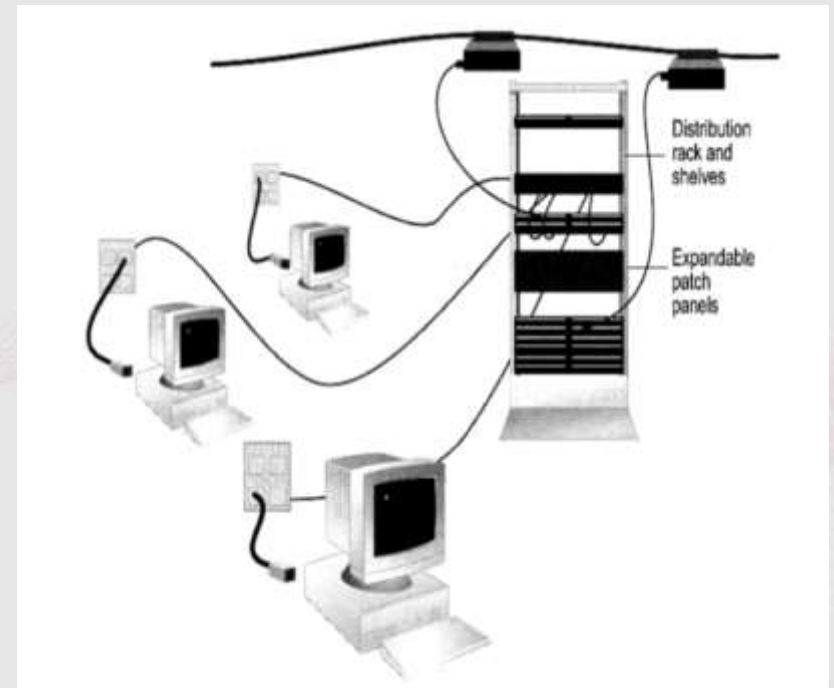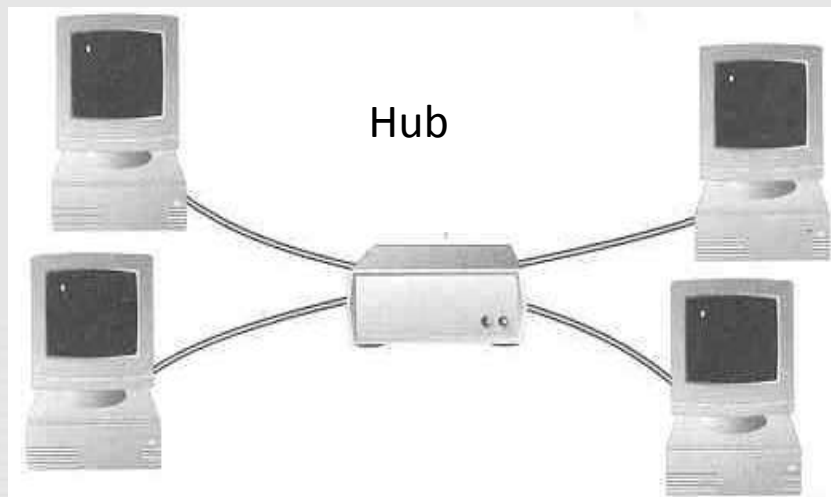
Advantages of Star Topology

- Good option for modern networks
- Low startup costs
- Easy to manage
- Offers opportunities for expansion
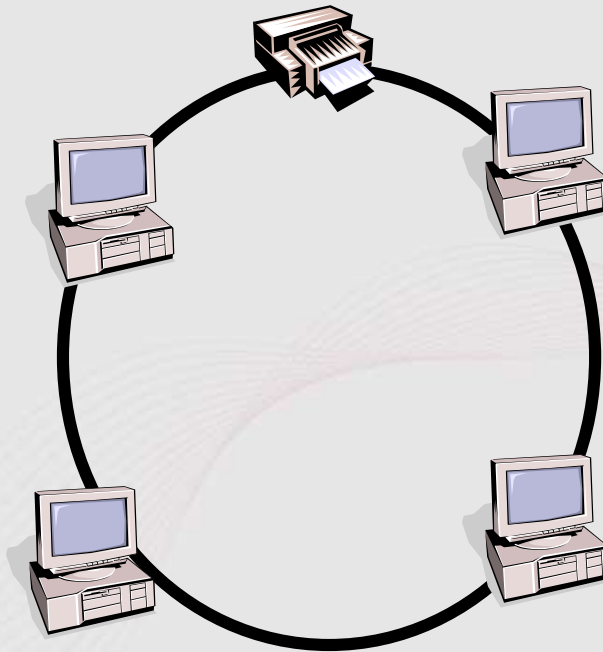- Most popular topology in use wide variety of equipment available

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Disadvantages of Star Topology

- Hub is a single point of failure
- Requires more cable than the bus
- Cost of installation is high.

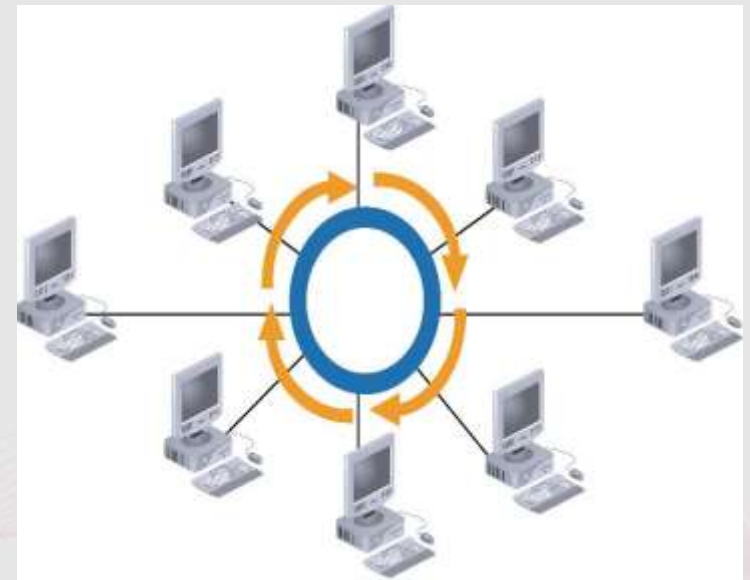Hub

Distribution rack and shelves

Expandable patch panels

Ring topology

A ring network is one where all workstations and other devices are connected in a continuous loop. There is no central server.
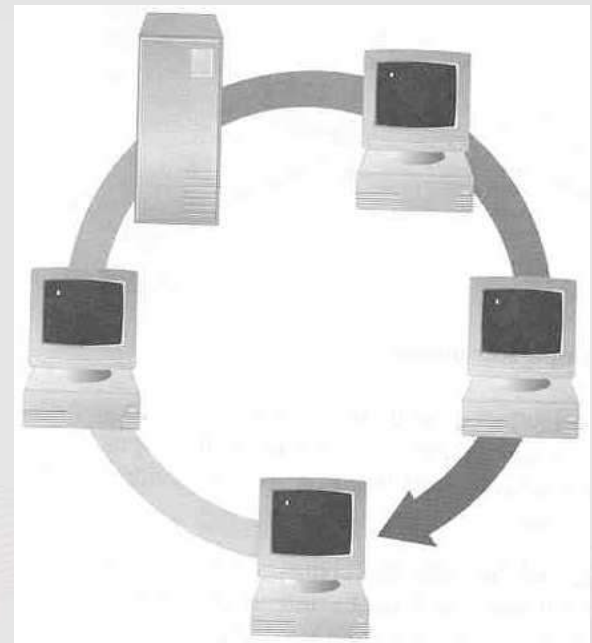
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Advantages of Ring Topology

- Easier to manage; easier to locate a defective node or cable problem

- Well-suited for transmitting signals over long distances on a LAN

- Handles high-volume network traffic
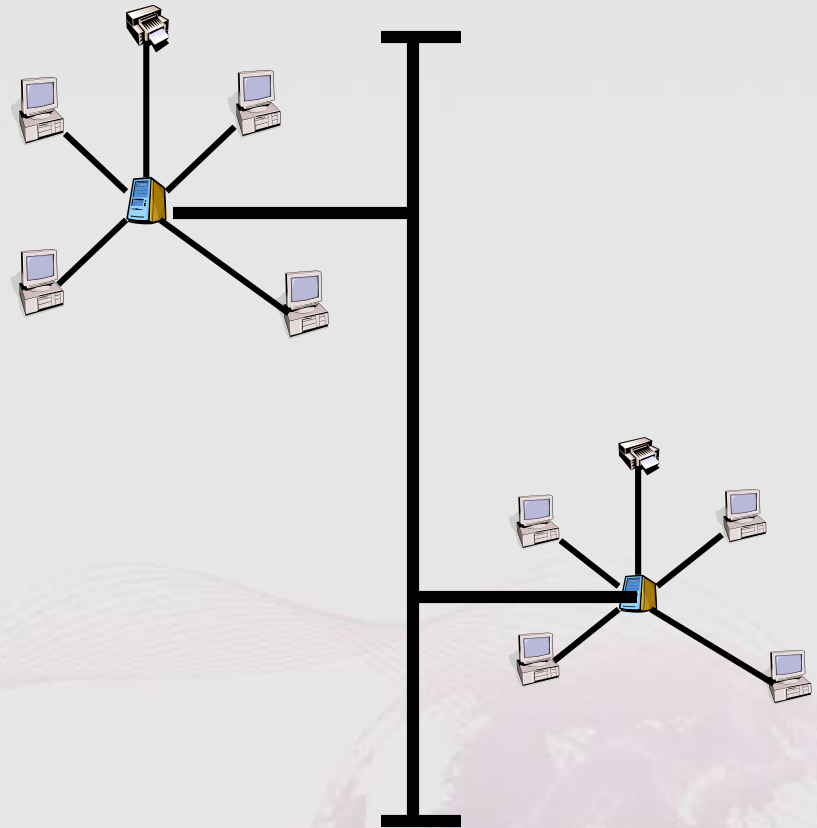
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Disadvantages of Ring Topology

- Expensive
- Requires more cable and network equipment at the start
- Not used as widely as bus topology
  - Fewer equipment options
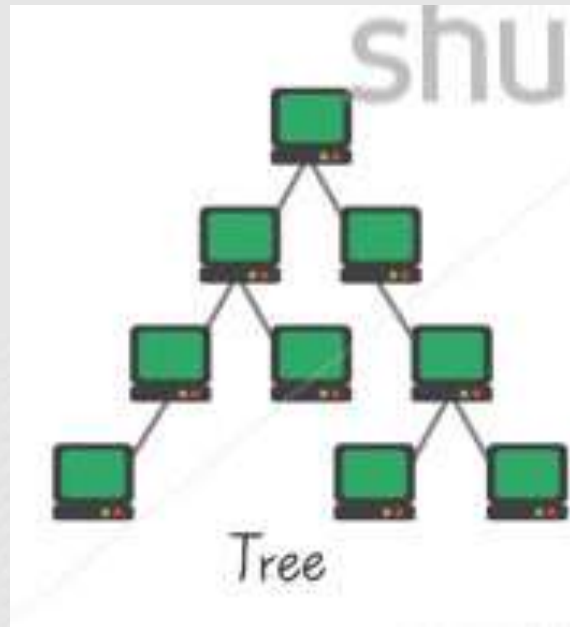 - Fewer options for expansion to high-speed communication

Tree topology

- It has a root node and all other nodes are connected to it forming a hierarchy. It is also called Hierarchical Topology.
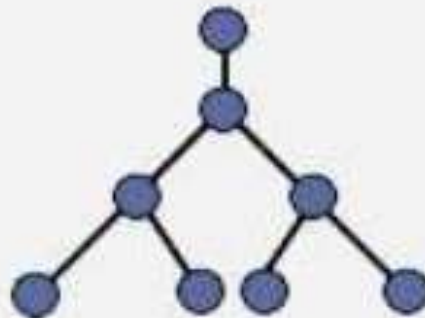
Advantages Of Tree Topology

- Extension of Bus and Star Topology.
- Expansion of nodes is possible and easy.
- Easily managed and maintained.

Tree

Disadvantages Of Tree Topology

- Heavily cabled.

- Costly.

- If more nodes are added maintenance is difficult.
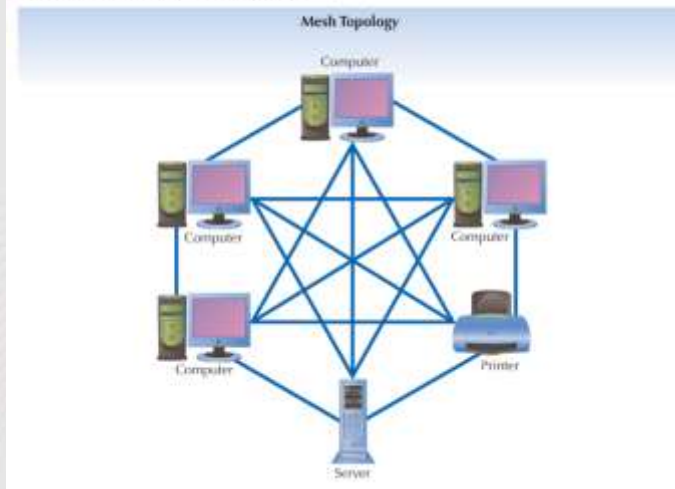
- Central hub fails, network fails.

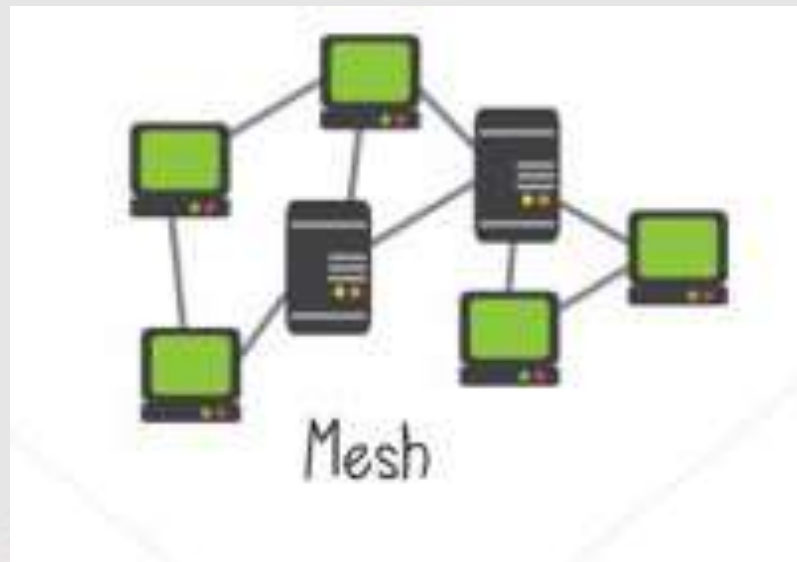Hierarchical

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Mesh Topology

It is a point-to-point connection to other nodes or devices. Traffic is carried only between two devices or nodes to which it is connected. Mesh has n(n-2)/2 physical channels to link hn devices.

Figure 5.5d Network Topologies

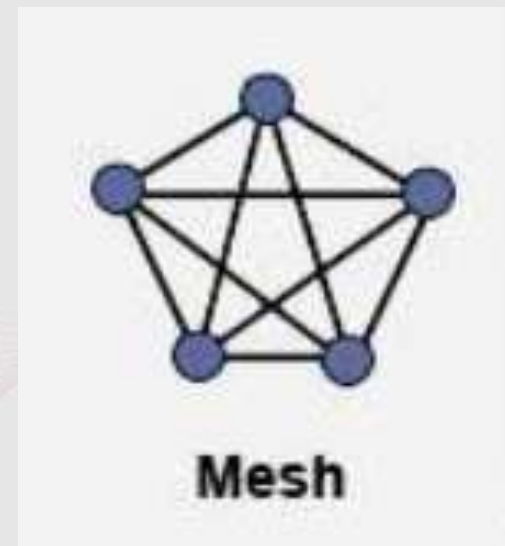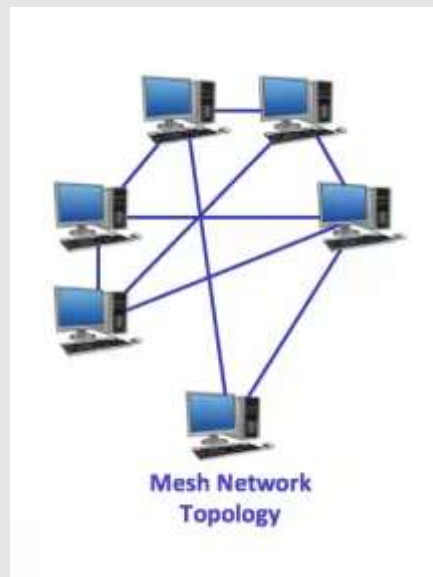Mesh Topology

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Advantages Of Mesh Topology

- Each connection can carry its own data load.
- Fault is diagnosed easily.
- Provide security and privacy.
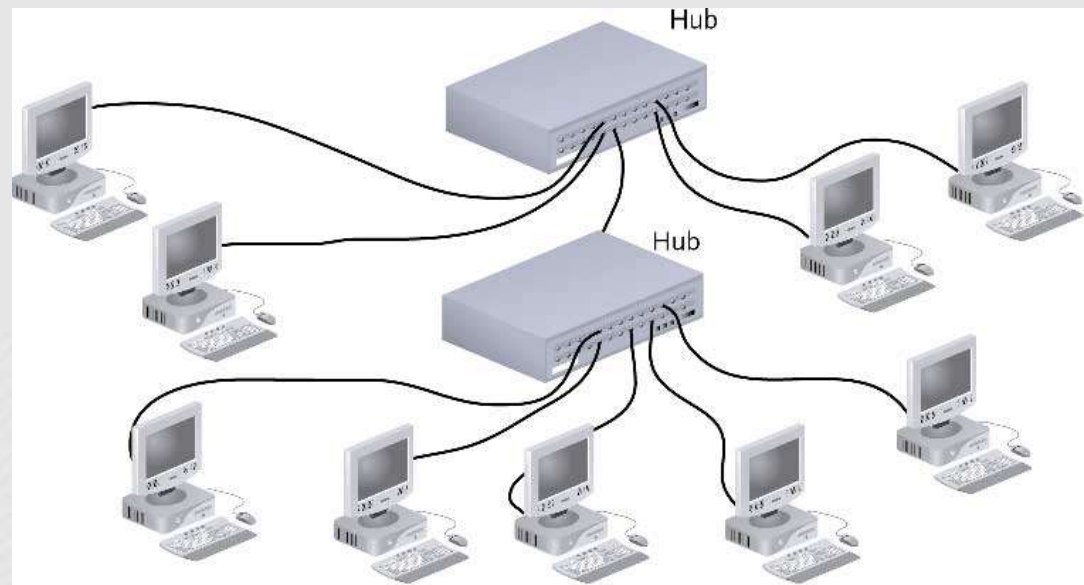

Mesh

Disadvantage of mesh topology

- Installation and configuration is difficult.
- Cabling cost is more.
- Bulk wiring is required.

Mesh Network Topology

Mesh

Hybrid Topology

It is the mixture of two or more topologies. Therefore it is called Hybrid topology. A hybrid topology combines characteristics of linear bus and star and/or ring topologies.
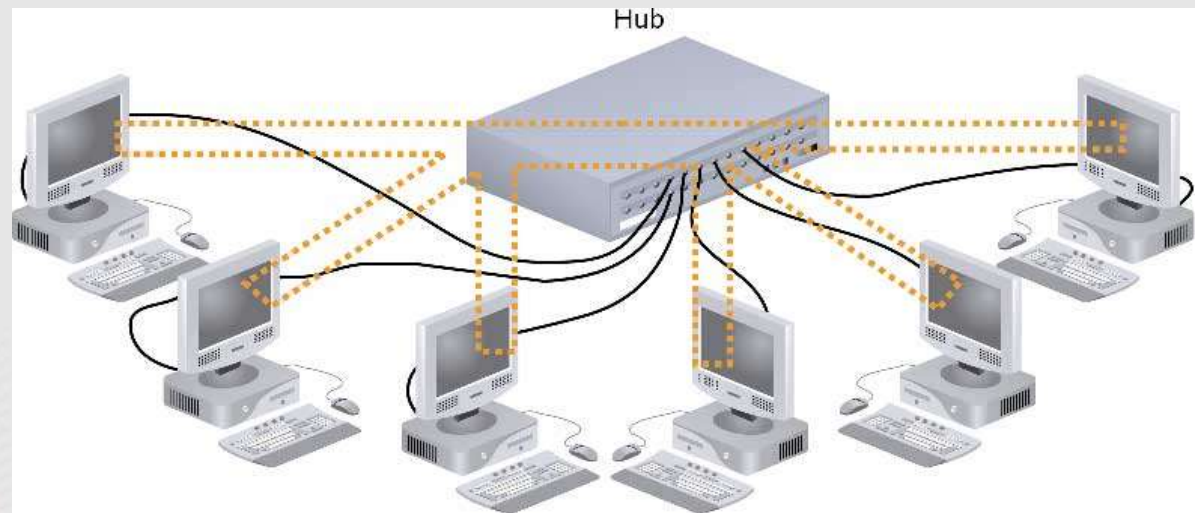
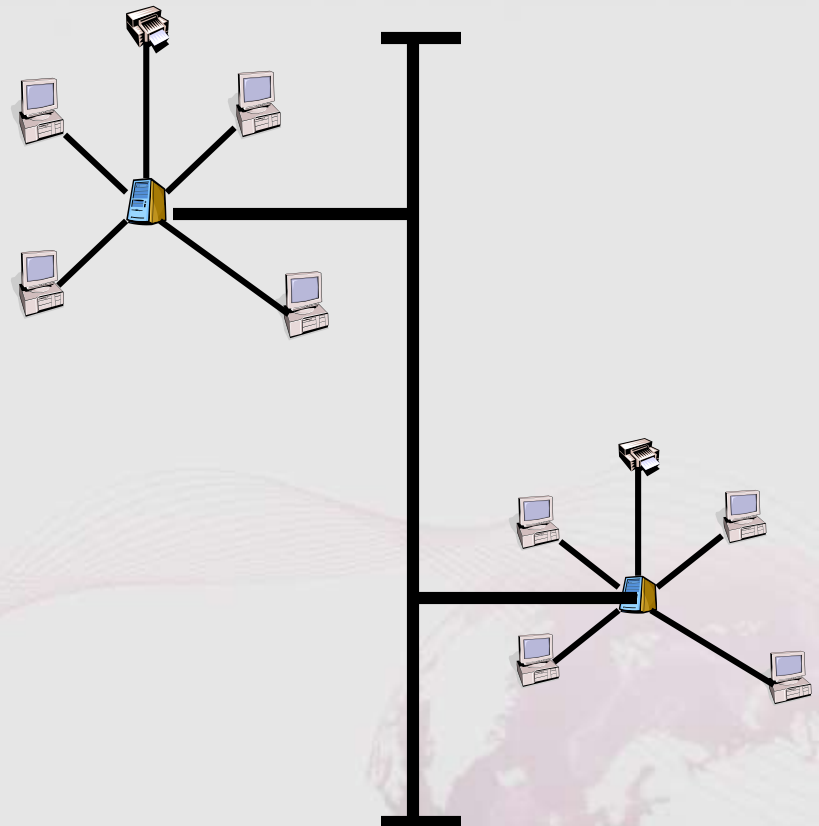Star-Wired Bus

Advantages of hybrid topology

- Reliable as error detecting and trouble shooting is easy.
- Effective.
- Scalable as size can be increased easily.
- Flexible.

Star-Wired Ring

Disadvantages Of Hybrid Topology

- Complex in design.
- Costly.

Thank You

Presented by:-
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