



### What is a Topology?

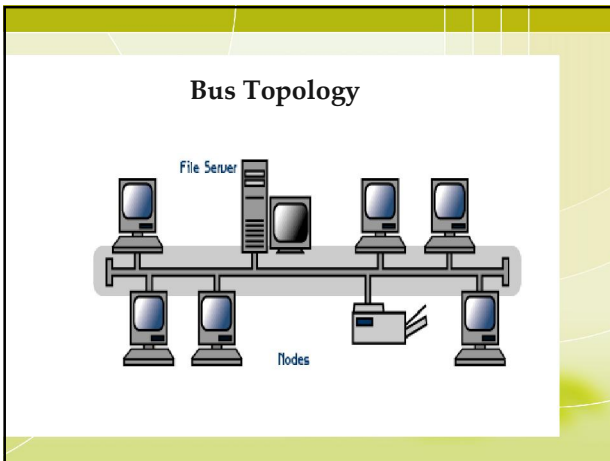
- Network topologies describe the ways in which the elements of a network are mapped. They describe the physical and logical arrangement of the network nodes.
- The physical topology of a network refers to the configuration of cables, computers, and other peripherals

### Different Types of Topologies

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

### Bus Topology

- All the nodes (file server, workstations, and peripherals) on a bus topology are connected by one single cable.
- A bus topology consists of a main run of cable with a terminator at each end. All nodes (file server, workstations, and peripherals) are connected to the linear cable.
- Popular on LANs because they are inexpensive and easy to install.



### Bus Topology

**Advantages of Bus Topology**

- It is Cheap, easy to handle and implement.
- Require less cable
- It is best suited for small networks.

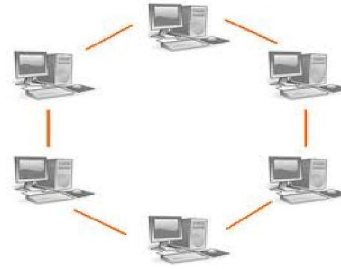
**Disadvantages of Bus Topology**

- The cable length is limited. This limits the number of stations that can be connected.
- This network topology can perform well only for a limited number of nodes.

## Ring Topology

- In a ring network, every device has exactly two neighbours for communication purposes.
- All messages travel through a ring in the same direction.
- A failure in any cable or device breaks the loop and can take down the entire network.
- To implement a ring network we use the Token Ring technology
- A token, or small data packet, is continuously passed around the network. When a device needs to transmit, it reserves the token for the next trip around, then attaches its data packet to it.

## Ring Topology



## Ring Topology

### *Advantage of Ring Topology*

- Very orderly network where every device has access to the token and the opportunity to transmit.
- Easier to Manage than a Bus Network
- Good Communication over long distances
- Handles high volume of traffic

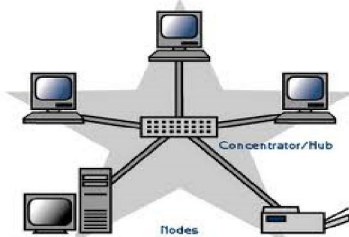
### *Disadvantages of Ring Topology*

- The failure of a single node of the network can cause the entire network to fail.
- The movement or changes made to network nodes affects the performance of the entire network.

## Star Topology

- In a star network, each node (file server, workstations, and peripherals) is connected to a central device called a hub.
- The hub takes a signal that comes from any node and passes it along to all the other nodes in the network.
- Data on a star network passes through the hub, switch, or concentrator before continuing to its destination.
- The hub, switch, or concentrator manages and controls all functions of the network.
- The star topology reduces the chance of network failure by connecting all of the systems to a central node.

## Star Topology



## Star Topology

### *Advantages of Star Topology*

- Easy to manage
- Easy to locate problems (cable/workstations)
- Easier to expand than a bus or ring topology.
- Easy to install and wire.
- Easy to detect faults and to remove parts.

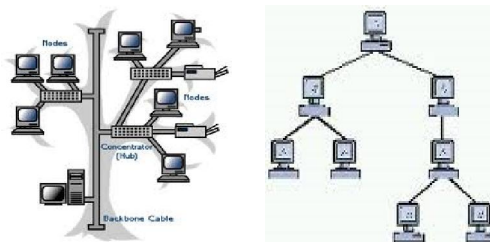
### *Disadvantages of Star Topology*

- Requires more cable length than a linear topology.
- If the hub or concentrator fails, nodes attached are disabled.
- More expensive because of the cost of the concentrators.

## Tree Topology

- A tree topology (hierarchical topology) can be viewed as a collection of star networks arranged in a hierarchy.
- This tree has individual peripheral nodes which are required to transmit to and receive from one other only and are not required to act as repeaters or regenerators.
- The tree topology arranges links and nodes into distinct hierarchies in order to allow greater control and easier troubleshooting.
- This is particularly helpful for colleges, universities and schools so that each of the connect to the big network in some way.

## Tree Topology



## Tree Topology

### Advantages of a Tree Topology

- Point-to-point wiring for individual segments.
- Supported by several hardware and software vendors.
- All the computers have access to the larger and their immediate networks.

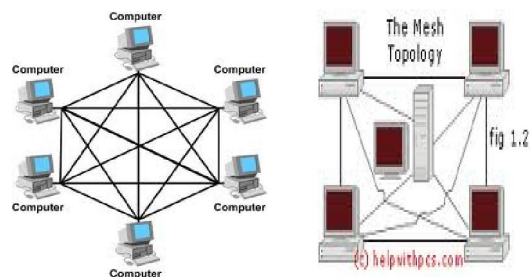
### Disadvantages of a Tree Topology

- Overall length of each segment is limited by the type of cabling used.
- If the backbone line breaks, the entire segment goes down.
- More difficult to configure and wire than other topologies.

## Mesh Topology

- In this topology, each node is connected to every other node in the network.
- Implementing the mesh topology is expensive and difficult.
- In this type of network, each node may send message to destination through multiple paths.
- While the data is travelling on the Mesh Network it is automatically configured to reach the destination by taking the shortest route which means the least number of hops.

## Mesh Topology



## Mesh Topology

### Advantage of Mesh Topology

- No traffic problems as there are dedicated links.
- It has multiple links, so if one route is blocked then other routes can be used for data communication.
- Points to point links make fault identification easy.

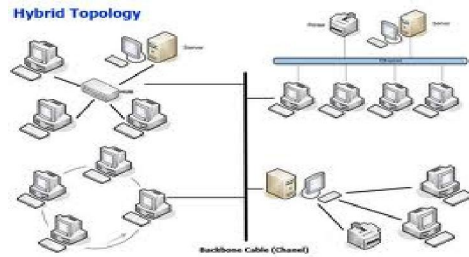
### Disadvantage of Mesh Topology

- There is mesh of wiring which can be difficult to manage.
- Installation is complex as each node is connected to every node.
- Cabling cost is high.

## Hybrid Topology

- A combination of any two or more network topologies.
- A hybrid topology always accrues when two different basic network topologies are connected.
- It is a mixture of above mentioned topologies. Usually, a central computer is attached with sub-controllers which in turn participate in a variety of topologies

## Hybrid Topology



## Hybrid Topology

### *Advantages of a Hybrid Topology*

- It is extremely flexible.
- It is very reliable.

### *Disadvantages of a Hybrid Topology*

- Expensive

THANKS A LOT  
HAVE A NICE DAY

