

Computer Network

Structure of a network- The geometrical arrangement of computer resources, network devices along with communication channel is known as Network structure or Network topology.

Topology can be physical or logical

- Physical Topology-physical layout of nodes and cables in the network.
- Logical topology - the way information flows between different components.

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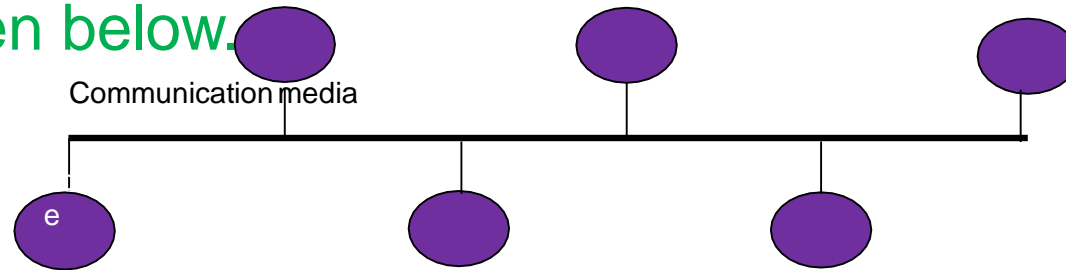
Types of Physical Network Topologies

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

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Bus Topology

Nodes are connected through a common communication media like diagram given below.



Advantages of a Bus topology

- Easy to install
- Minimal Cable

Disadvantages of a Bus topology

- Difficult reconnection
- Difficult to find the problem
- Difficult to add new devices
- Break stops all transmission of data

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Star Topology

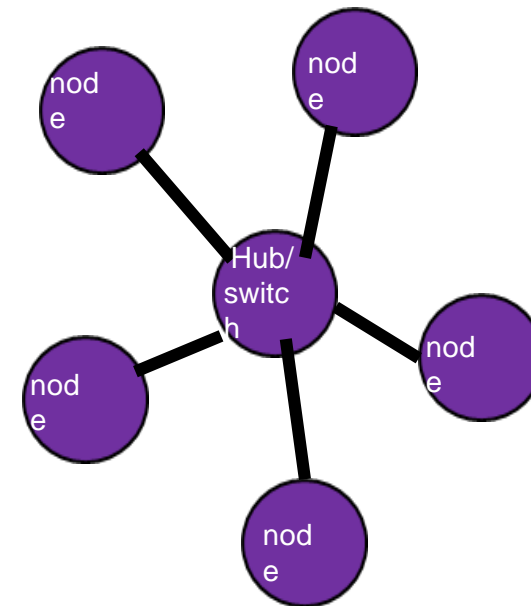
The star topology uses a separate cable for each node/workstation. The cable connects the node to a central device typically a HUB.

Advantages of a Star topology

- Less expensive than mesh
- Easy to install, easy to configure
- If one link fails the network can still function

Disadvantages of a Star topology

- Everything depends on the hub



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Ring Topology

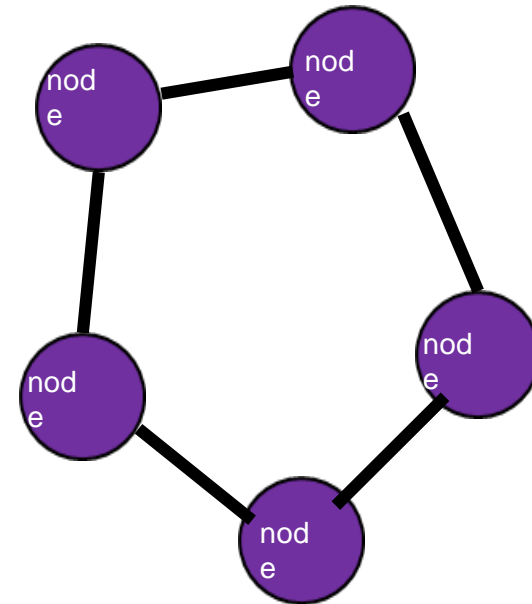
In ring topology every computer is connected to the next computer in the ring and each transmit the signal ,what it receives from the previous computer. The messages flow around the ring in one direction.

Advantages of a Ring topology

- Easy to install
- Easy to reconfigure
- Easy to detect a problem

Disadvantages of a Ring topology

- Break means the whole system is dead



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Mesh Topology

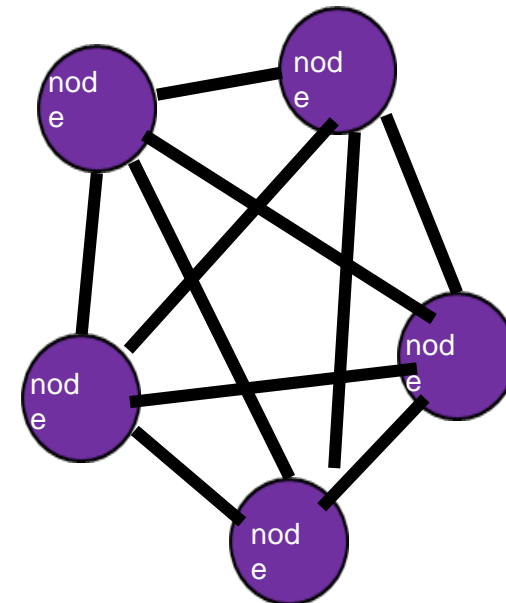
In mesh topology , separate cable is used to connect each device to every other device on the network, providing a straight communication path.

Advantages of a Mesh topology

- Avoid traffic since each link can carry its own data and none are being shared
- If one link breaks, the rest of the network is still functional
- Easy to detect a problem in the network by discovering which device is having problems and examining the link that connects to it.

Disadvantages of a Mesh topology

- A lot of cables are needed
- Too many cables means too much cost
- Too many cables means complex network



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Tree Topology

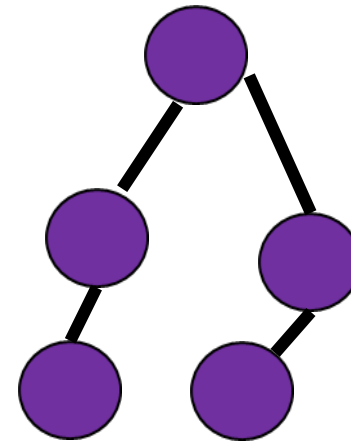
In which a central root node (the top level of the hierarchy) is connected to one or more other nodes that are one level lower in the hierarchy

Advantages of a Mesh topology

- It is scalable.
- Easier fault identification and isolation.

Disadvantages of a Mesh topology

- Maintenance of the network may be an issue when the network spans a great area.
- if the backbone fails, the entire network is crippled.



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Hybrid Topology

use a combination of any two or more topologies in such a way that the resulting network does not exhibit one of the standard topologies (e.g., bus, star, ring, etc.).

