

Topologies

The pattern of interconnection of nodes in a network is called the topology.

Bus Topology

A linear 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.

Advantages of Linear Bus Topology

- * Easy to connect a computer or peripheral to a linear bus.
- * Requires less cable length than a star topology.

Disadvantages of a Linear Bus Topology

- * Entire network shuts down if there is a break in the main cable
- * Terminators are required at both ends of the backbone cable.
- * Difficult to identify the problem if the entire network shuts down.

Star Topology

A star topology is designed with each node (file server, workstations, and peripherals) connected directly to a central network hub or concentrator.

Data on a star network passes through the hub or concentrator before continuing to its destination.

The hub or concentrator manages and controls all functions of the network. It also acts as a repeater for the data flow.

Advantages of a star topology

- * Easy to install and wire.
- * No disruptions to the network when connecting or removing devices.
- * Easy to detect faults and to remove parts.

Disadvantages of a star Topology

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

Ring Topology

Ring Network, a local area network formed in a ring (closed loop) topology that uses token passing as means of regulating traffic on the line.

On a token ring network, a token governing the right to transmit is passed from one station to the next in a physical circle.

Advantages of Ring Topology

- * Short Cable length as compared to star.
- * No wiring closet space required.
- * Suitable for optical fibres
 - ✓ High speed
 - ✓ Traffic travels in one direction

Disadvantages of Ring Topology

- ✓ Node failure causes network failure.
- ✓ Difficult to diagnoses faults.
- ✓ Network reconfiguration is difficult. It is not possible to shut down a small section of the ring.

Tree Topology

A tree topology combines characteristics of linear bus and star topologies.

It consists of groups of star configured workstations connected to a linear bus backbone cable.

Tree topologies allow for the expansion of an existing network, and enable schools to configure a network to meet their needs.

Advantages of a Tree Topology

Point – to – point wiring for individual segments.

Supported by several hardware and software venders.

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.