Computer Network

Class Six

Lab 3

UNITED TRUST

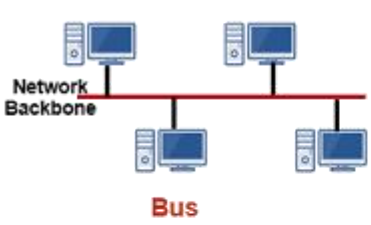
bdeducation
Bangladesh Digital Education Research Limited
সময়ের পাঠশালা

Lab Objectives:

- Network Topologies
- Node

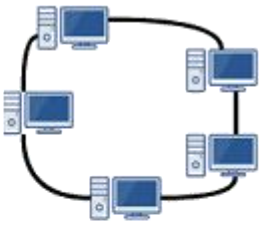
Network Topology

Network Topology refers to layout of a network. How different nodes in a network are connected to each other and how they communicate is determined by the network's topology.

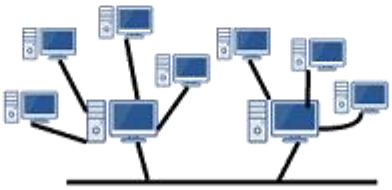


Bus

Star


Ring


Mesh

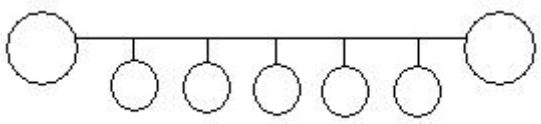

Tree


Point-to-Point

1. Bus Topology

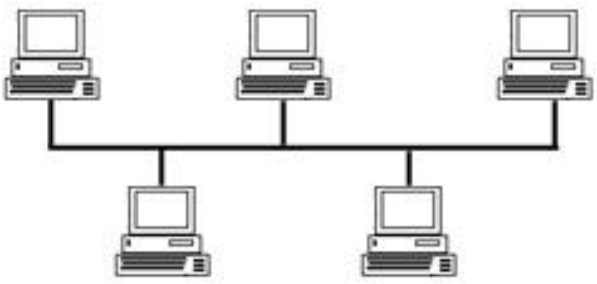
In networking a bus is the central cable. The main wire, that connects all devices on a local-area network (LAN). It is also called the backbone.

This is often used to describe the main network connections composing the Internet. Bus networks are relatively inexpensive and easy to install for small networks. Ethernet systems use a bus topology.

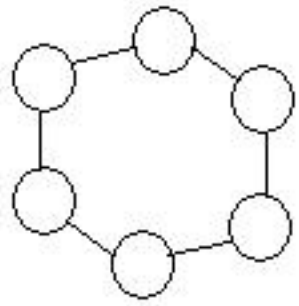


Main Advantage: It's easy to connect a computer or device and typically it requires less cable

Main Disadvantage: The entire network shuts down if there is a break in the main wire and it can be difficult to identify the problem if the network shuts down.



2. Ring Topology

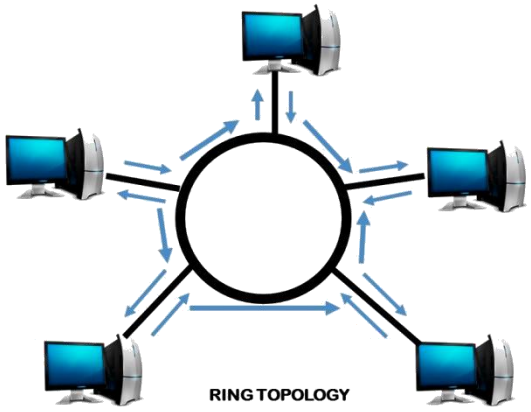


A local-area network (LAN) whose topology is a ring.

That is, all of the nodes are connected in a closed loop. Messages travel around the ring, with each node reading those messages addressed to it.

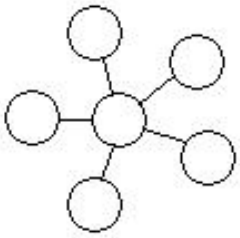
Main Advantage: One main advantage to a ring network is that it can span larger distances than other types of networks, such as bus networks, because each node regenerates messages as they pass through it.

Main Disadvantage: In a ring network, one malfunctioning node affects the rest of the network.

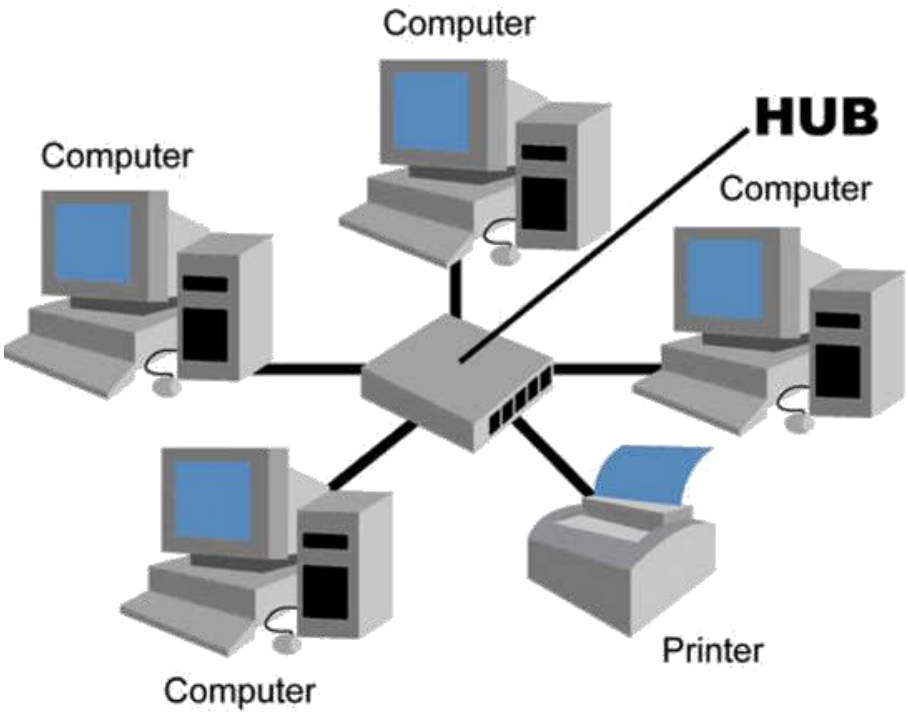


3. Star Topology

In a star network devices are connected to a central computer, called a hub. Nodes communicate across the network by passing data through the hub.



Main Advantage: In a star network, one malfunctioning node doesn't affect the rest of the network.
Main Disadvantage: If the central computer fails, the entire network becomes unusable.



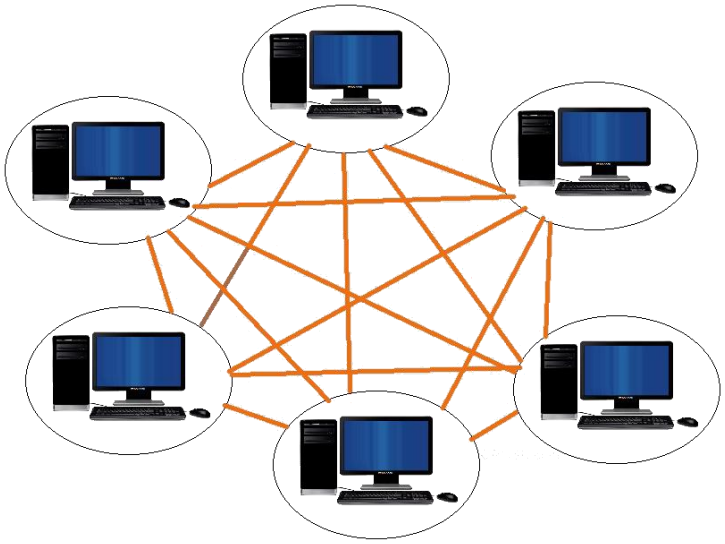
4. MESH Topology

In a mesh network, devices are connected with many redundant interconnections between network nodes.

In a true mesh topology every node has a connection to every other node in the network. There are two types of mesh topologies:

√ Full mesh topology

√ Partial mesh topology



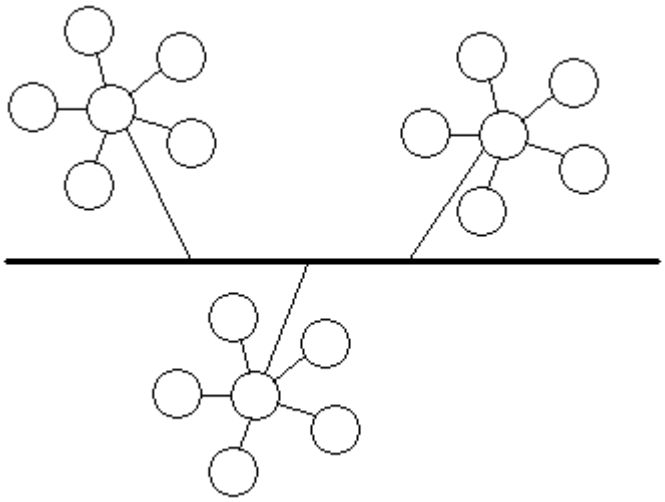
Main Advantage: Manages high amounts of traffic, because multiple devices can transmit data simultaneously.

Main Disadvantage: The cost to implement is higher than other network topologies

5. Tree Topology

This is a "hybrid" topology that combines characteristics of linear bus and star topologies.

In a tree network, groups of star-configured networks are connected to a linear bus backbone cable.



Main Advantage: A Tree topology is a good choice for large computer networks as the tree topology "divides" the whole network into parts that are more easily manageable.

Main Disadvantage: The entire network depends on a central hub and a failure of the central hub can cripple the whole network.