NETWORK BASICS

Modules :

- What is Networking ?
- Types of Networks
- Network Topologies
- Advantages of Networks

What is Networking ?

- It is a Practise of connecting multiple computing devices in order to share the resources, Exchange files and allow Electronic Communication.
- The Computer Network can be linked through a medium such as Cables, Telephone lines, Radio waves, Satellites or Infrared beams.

TYPES OF NETWOKS :

- **Local Area Network (LAN)** is used to connect devices in a shortest distance, such as within a Building, School or Home.
- **Wide Area Network (WAN)** is used to connect devices across large Geographical area, such as communication between different countries.
- **Metropolitan Area Network (MAN)** is a Data Network designed for a town or a city.
- **Storage Area Network (SAN)** is a Network designed to share the Storage Area to multiple devices

Difference b/w LAN MAN WAN

LAN LOCAL AREA NETWORK	MAN METROPOLITAN AREA NETWORK	WAN WIDE AREA NETWORK
Use Building Office School , house	Multiple building , or in a city	Multiple city , country
Network Range 10m – 1000m	5km – 50km	1000000km
Example Ethernet , Wifi	Cable tv network	Internet

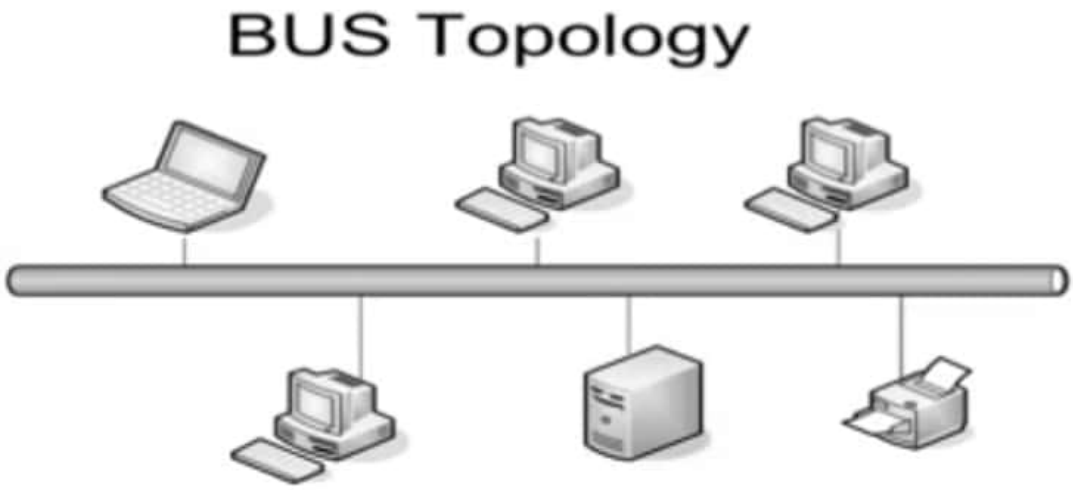
NETWORK TOPOLOGY

Topology refers to Virtual layout or Arrangement of the devices in a Network.

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

BUS TOPOLOGY :

This topology utilizes a common backbone, In General a single cable will be used to connect all the devices on a network

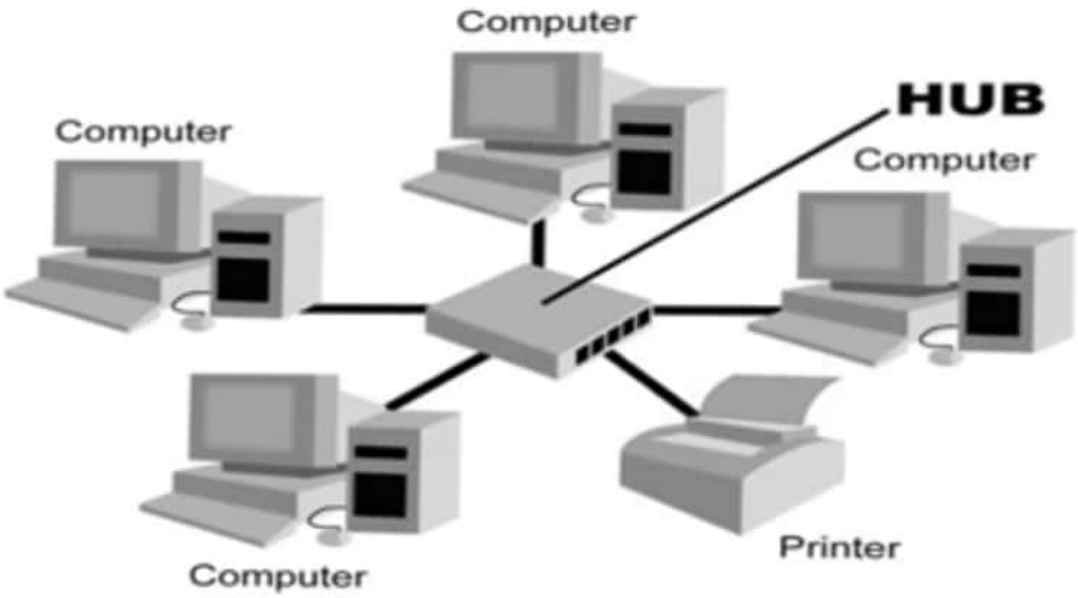


RING TOPOLOGY :

Each device will have two neighbours for communication. All data travels in a ring, and a failure of that ring will bring the whole network down.

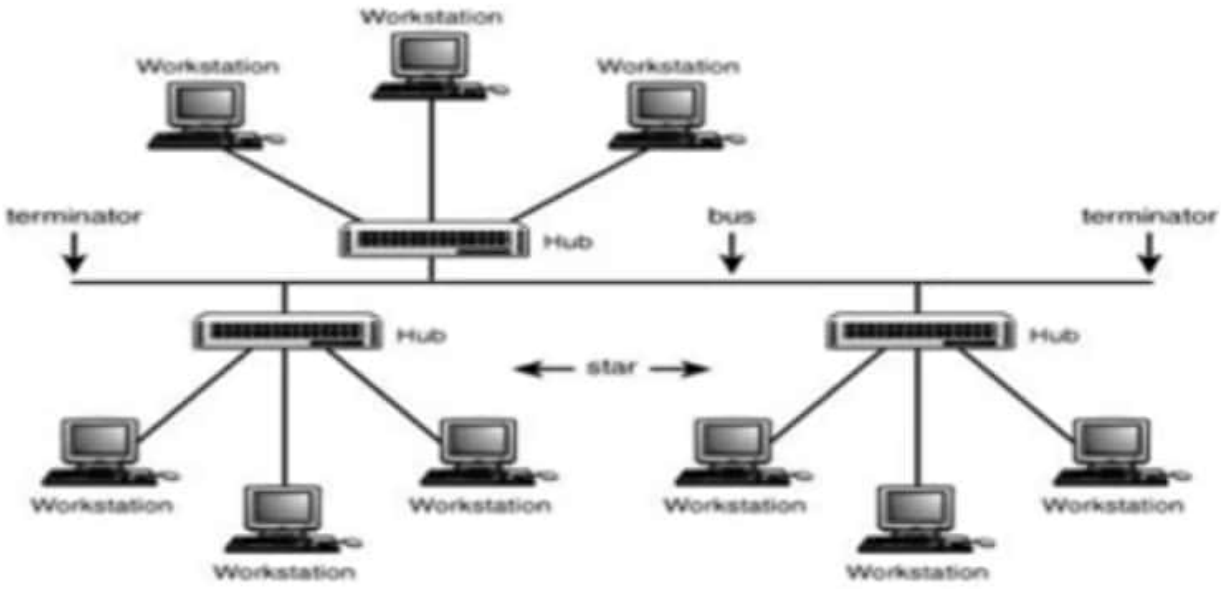
STAR TOPOLOGY :

The central connection known as a "hub", it will be connected to all the devices on the network. This hub could be a router or a switch.



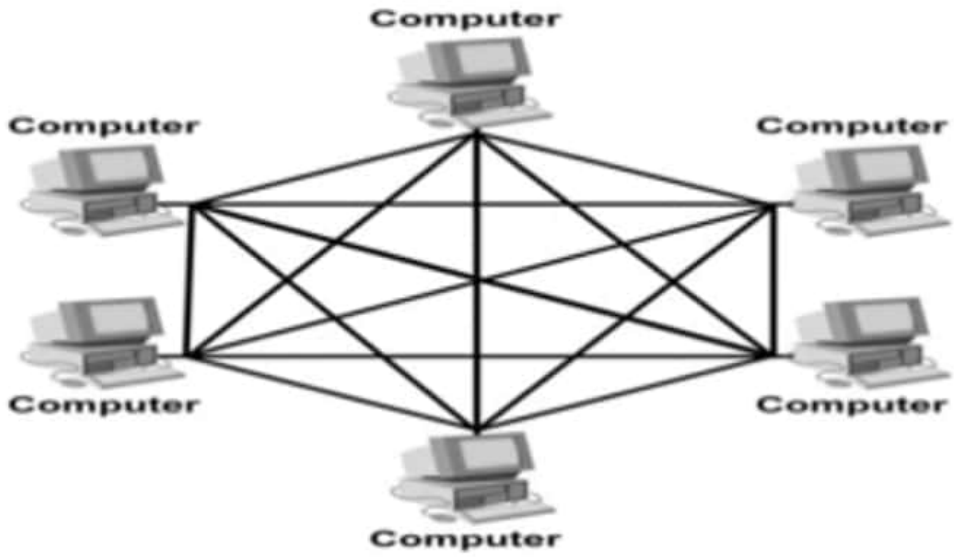
TREE TOPOLOGY :

It combines characteristics of linear bus and star topologies. It consists of groups of star-configured workstations connected to a linear bus backbone cable.



MESH TOPOLOGY :

In Mesh, each devices in the network are interconnected to other devices. Every node not only sends its own signals but also relays data from other nodes



Advantages of Networks :

- Communication
- Data Sharing
- Internet Services
- Video conferencing
- Broad casting
- Remote Access
- Flexible
- Reliable
- Data Transmission

Network Devices

Network devices are the components that are used to interconnect multiple computing devices to form a Network, In order to share files or resources like printers or fax machines and for communications

Types of Networking Devices

- HUB
- BRIDGE
- MODEM
- SWITCH
- ROUTER

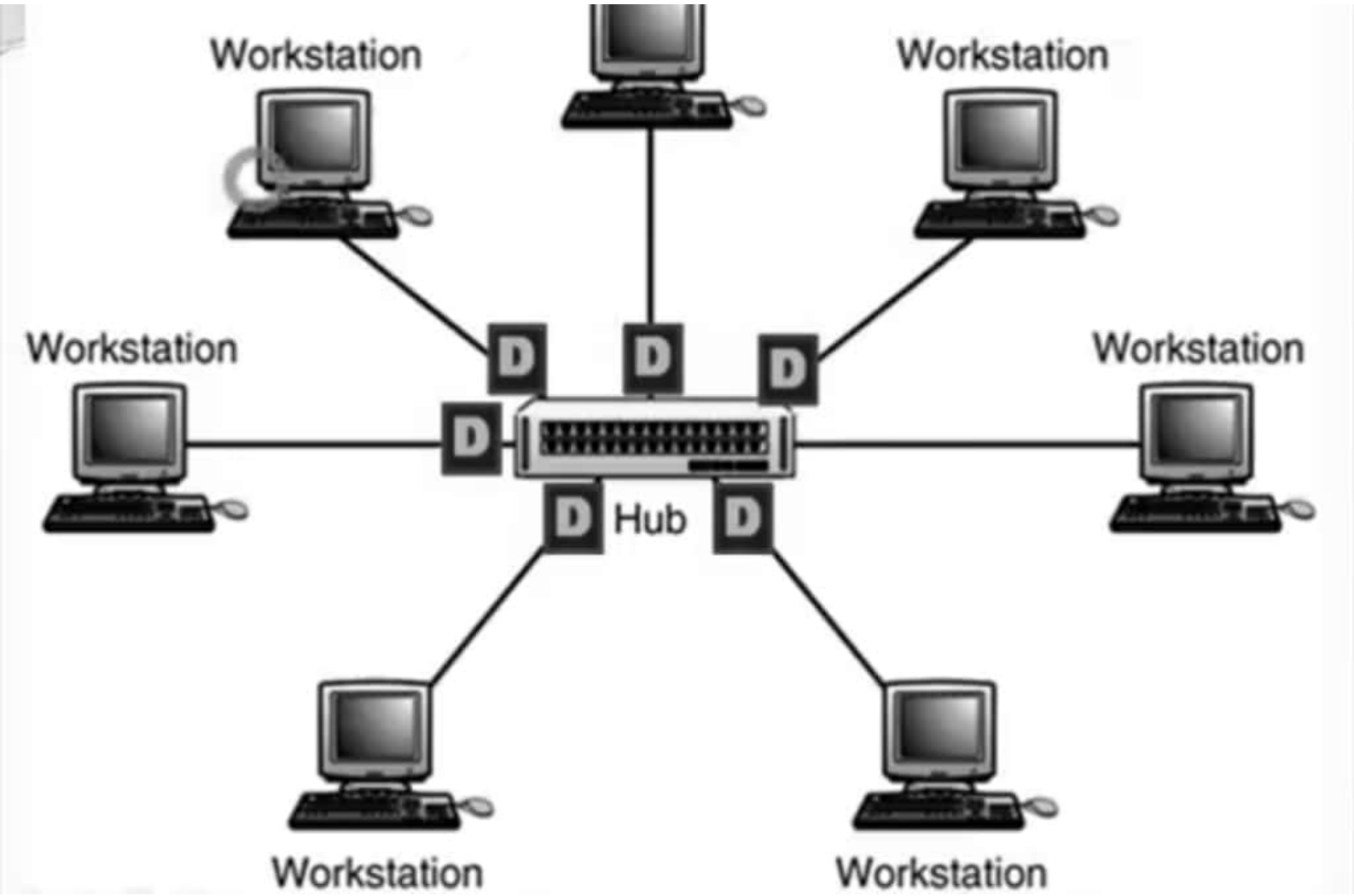
HUB

It is used to connect multiple computers as a single LAN network. Generally HUBs are available with 4,8,12,24,48 ports.

2 Types :

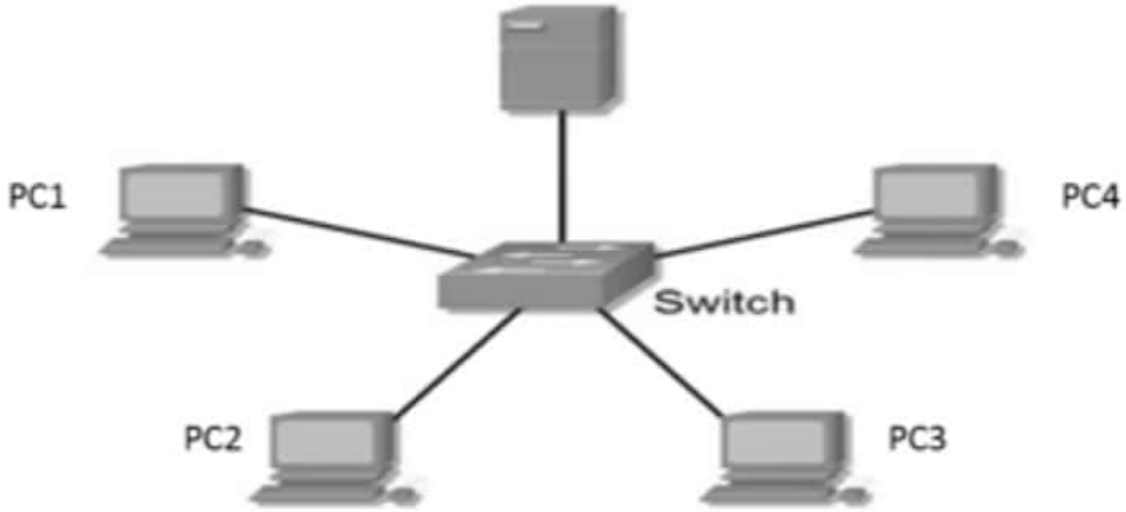
Passive Hub, Forwards signals to all ports except the port on which data signal arrived.

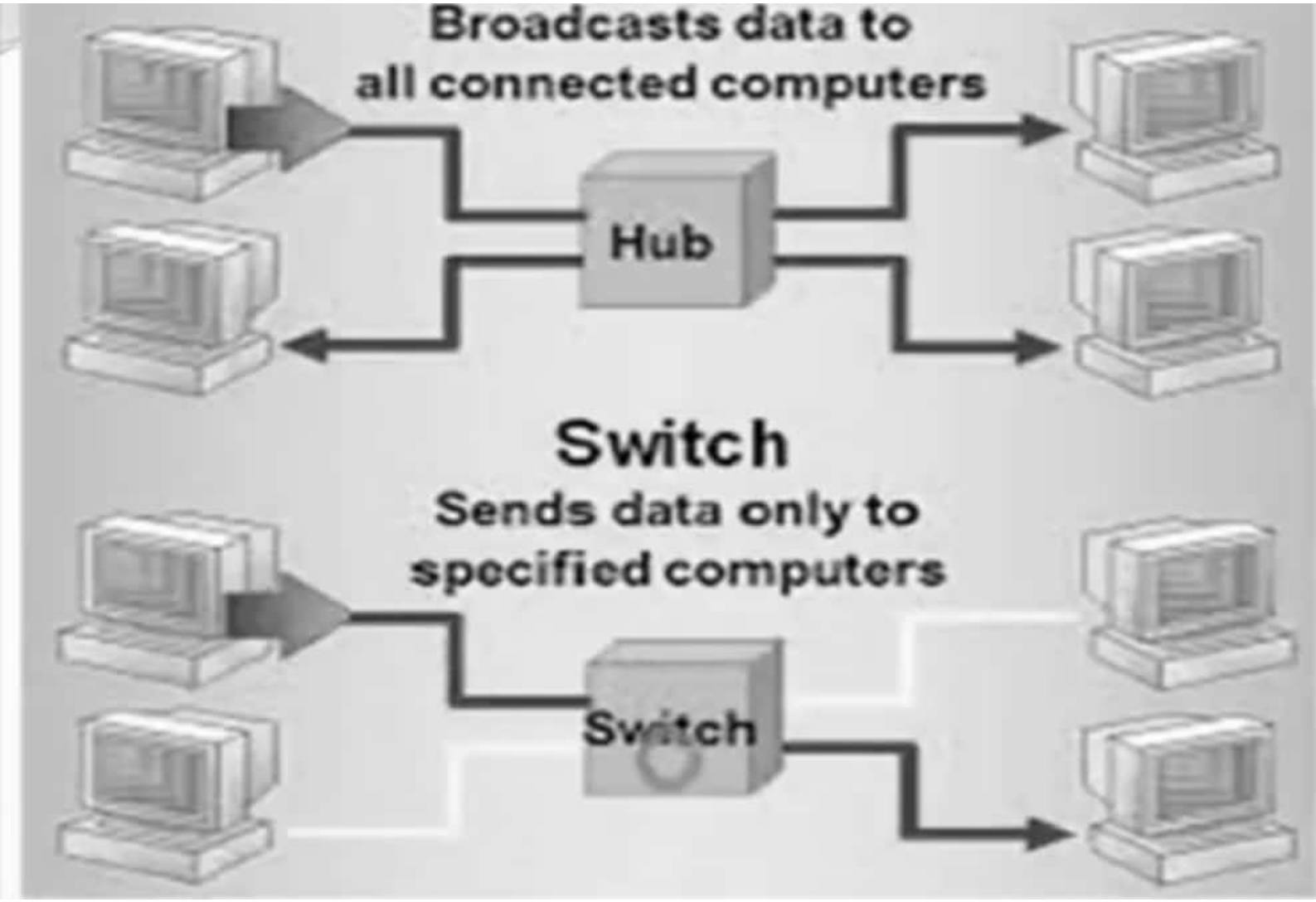
Active Hub, It is same as like passive hub but in addition before forwarding it will improve the quality of signal by amplifying it.



SWITCH

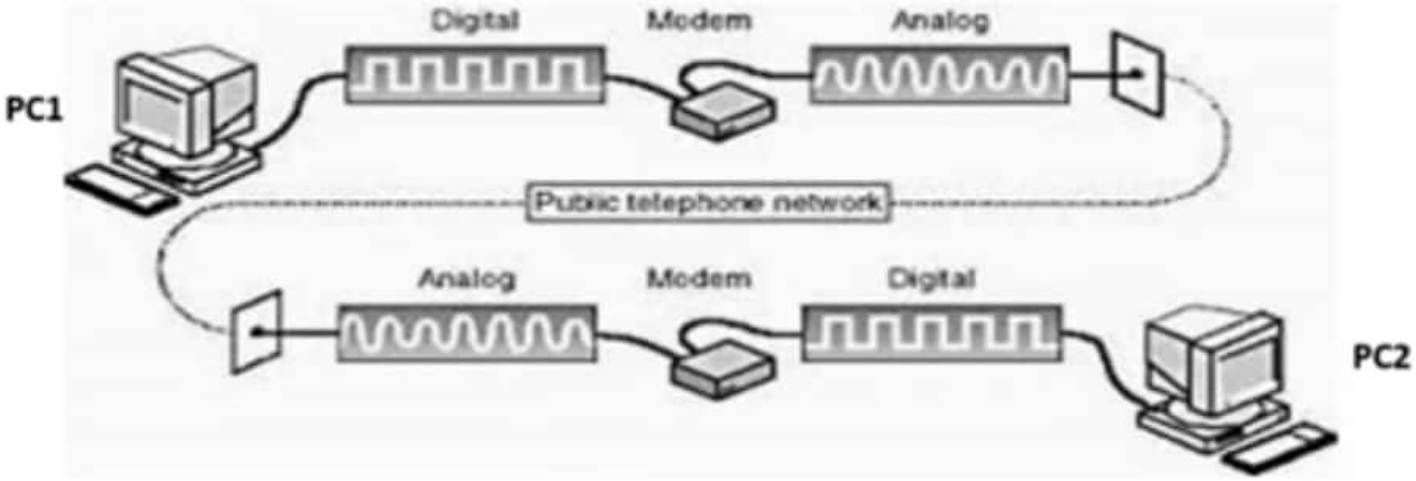
It is a device used to connect multiple devices to form a network, unlike hub it wont forward the data to all. Instead it will receive a packet, Process and forward data to the destination device.





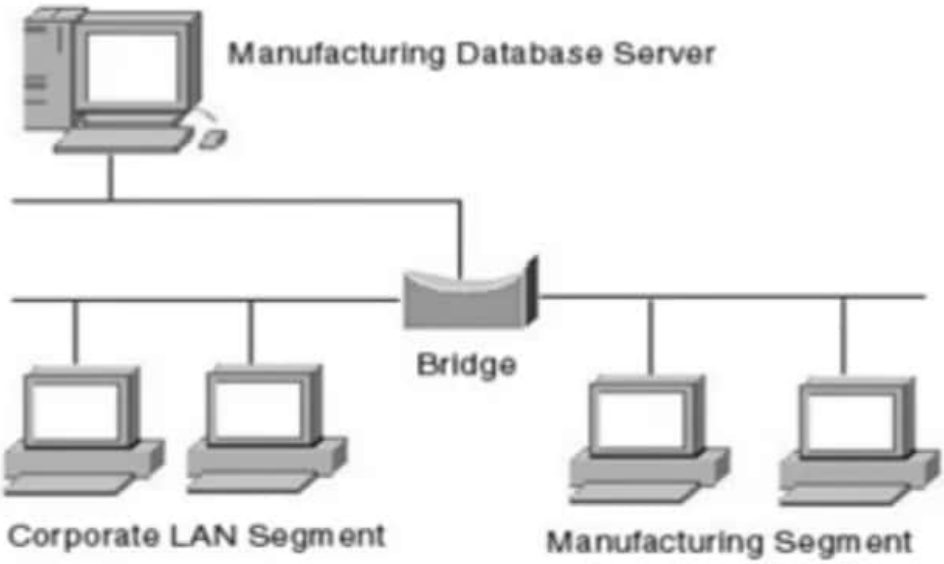
MODEM

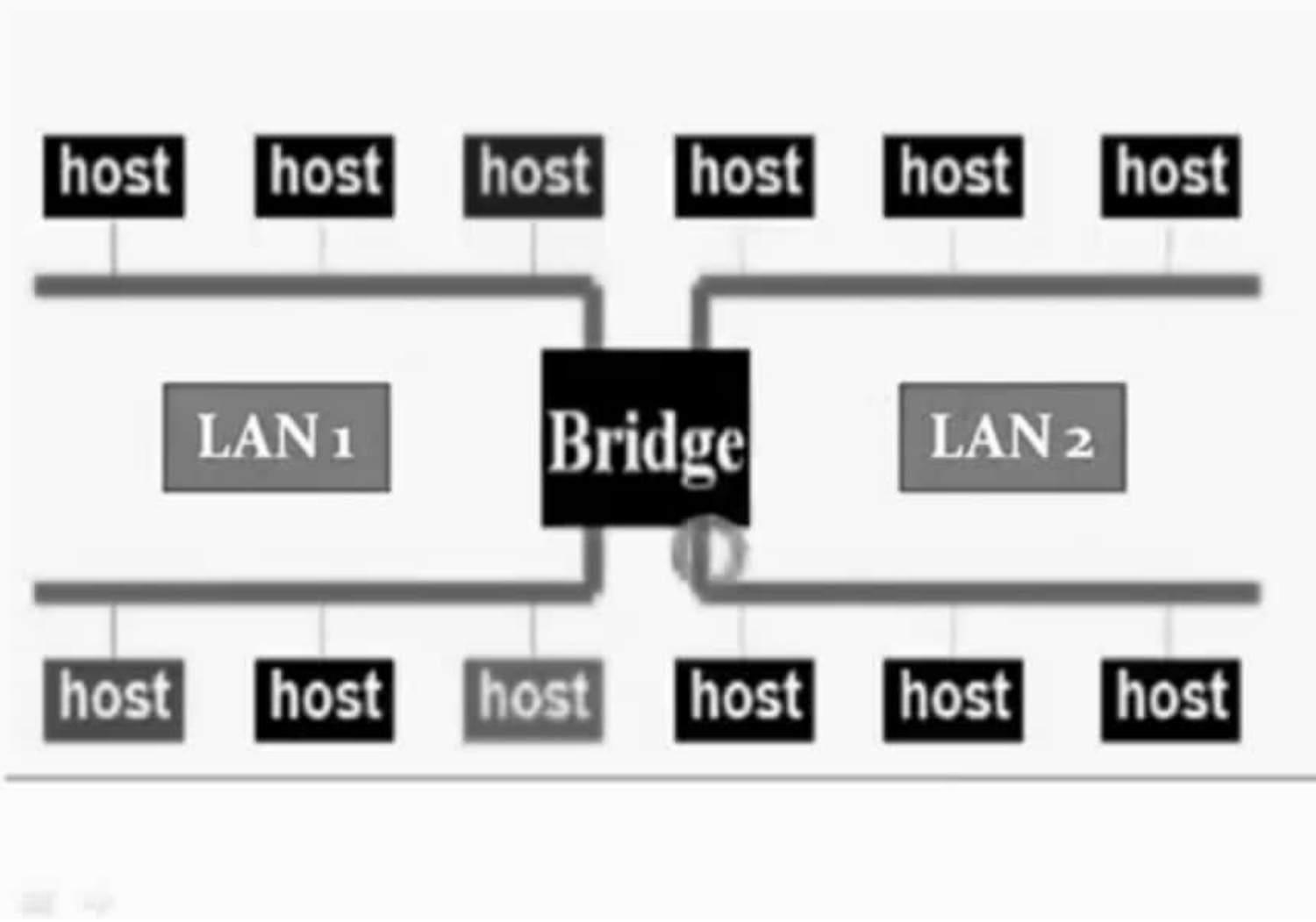
- It is a device that is used to connect with Internet using Telephone lines.
- It convert digital signals to Analog signals and Analog signals to digital signals

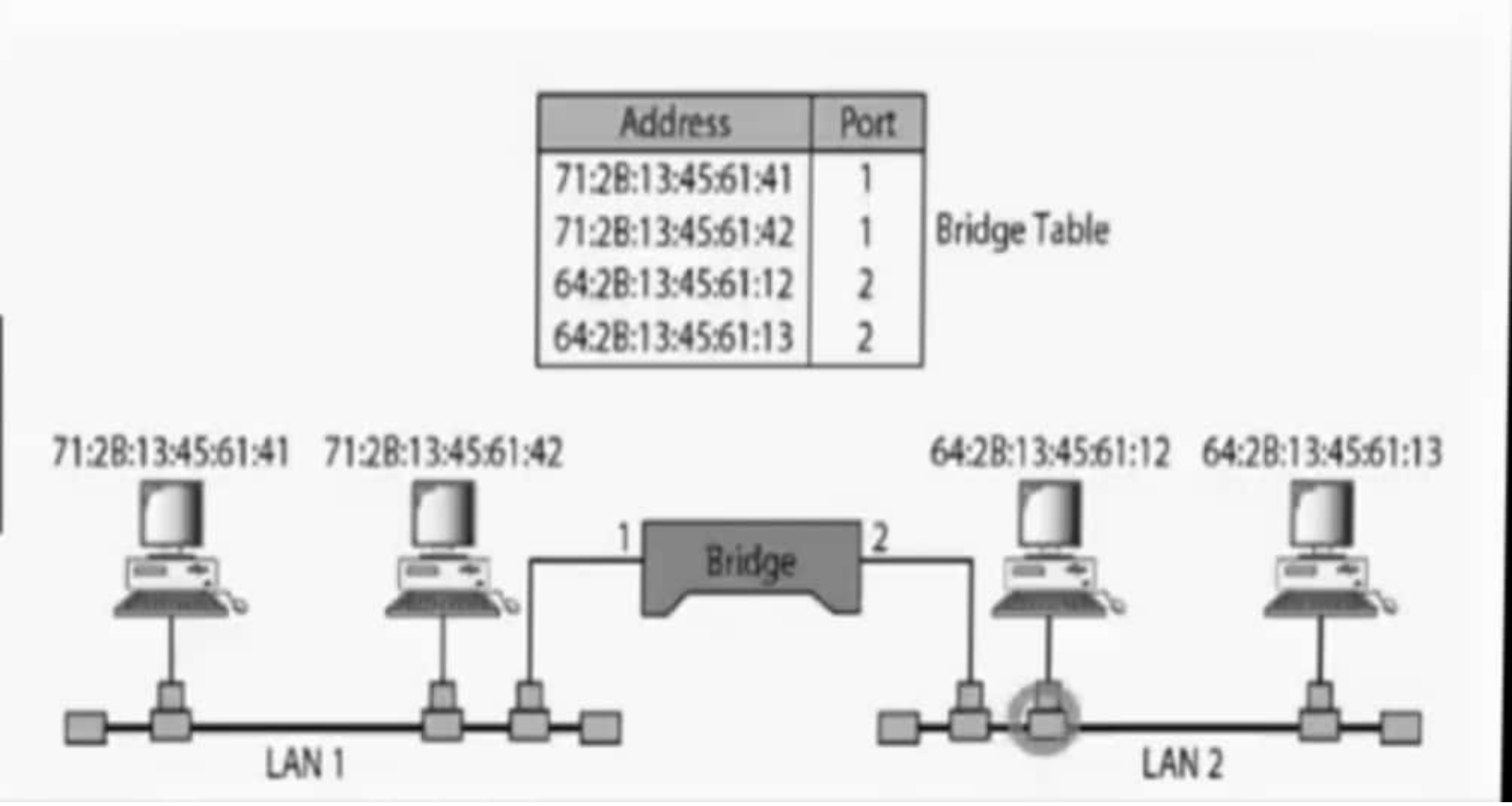


BRIDGE

It is a device used to connect to different computing devices and also used to divide a large network in to smaller segments.







ROUTER

It is a layer three device which forwards data packet from one network to another. Router forwards packets on the bases of their destination address. For this router keeps record of the path that packets can use as they move across the network. These records are maintained in a database table known as routing table. Routing table can be built statically or dynamically.