

5. A metropolitan area network (MAN) is a hybrid between a LAN and a WAN. Metropolitan area network covers a wider area than a local area network. Usually MAN covers a large metropolitan city and is a scaled down version of wide area network. It operates at high speeds over distances sufficient for a metropolitan area.

4.4 Network Topology

1. Star Network

In a star network, the nodes (workstations) are connected to a central computer called the host computer. The nodes cannot communicate directly. Each node can communicate with the host computer. The host computer takes the message and routes it to the other node or nodes.



Figure: star network

2. Ring Network

Each device is connected to two other devices, forming a ring. See figure below. There is no central file server or computer. Communications travel around the ring.

In a ring network, every device has exactly two neighbors for communication purposes. All messages travel through a ring in the same direction (either “clockwise” or “counterclockwise”). A failure in any cable or device breaks the loop and can take down the entire network.



Figure: Ring Network

3. Bus Network

Each device in the network handles its own communications control. There is no host computer. All communications travel along a common connecting cable called a bus or backbone. The disadvantage is that extra circuitry and software are needed to avoid collisions between data. If the connection is broken, the entire network may stop working.

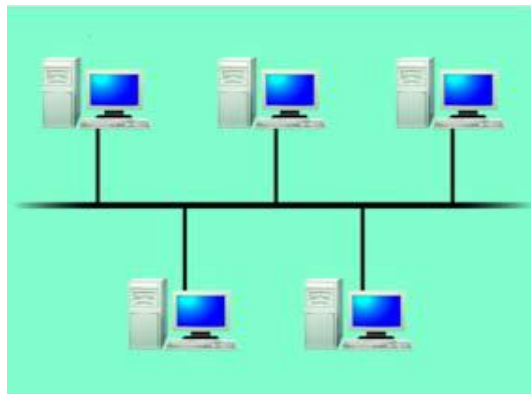


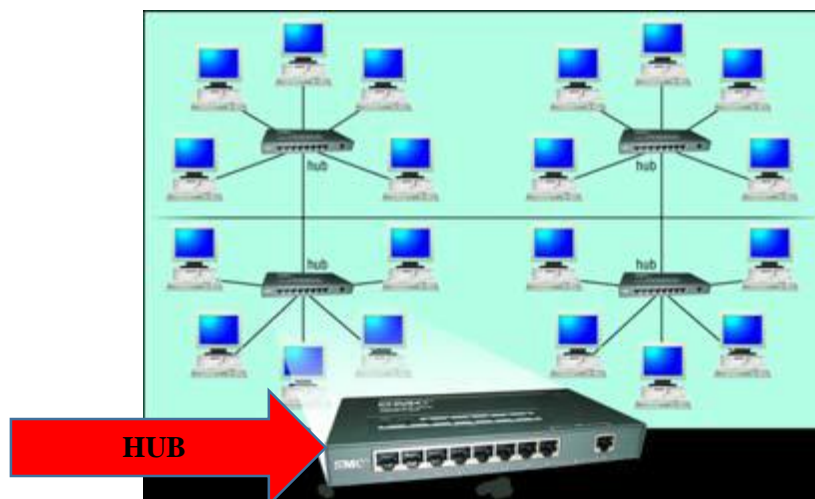
Figure: Bus network

4.5 Basic Hardware Components

There are several ways to connect multiple computers:

1. Hub:

A hub is rectangular box that is used as the central object on which computers and other devices are connected. To make this possible, a hub is equipped with small holes called ports.



2. Network switch:

If the hub directs data to specific computers based on an address that is attached to the data, the device is also called a network switch.

3. Node:

Which is any device that is connected to a network. It could be a computer, printer or data storage device.

4. Network Card

Network card is a necessary component of a computer without which a computer cannot be connected over a network. It is also known as network adapter or Network

Interface Card (NIC). Network cards are of two types: Internal and External Network Cards.

a. Internal network cards

Motherboard has a slot for internal network card where it is to be inserted. Internal network cards are of two types in which first type uses Peripheral Component Interconnect (PCI) connection while the second type uses Industry Standard Architecture (ISA). Network cables are required to provide network access.



5. A bridge:

Can be used to receive and send messages when several networks that use the same network software are connected.

6. A Router

A **router** is hardware device designed to receive, analyze and move incoming packets to another network.

A **packet** is a segment of data sent from one computer or device to another over a network.

