Advantages of Networking

Sharing of resources and communication are the two major reasons for networking. Networking is necessary for the following reasons:

» **To share computer files:** A network makes it easy for anyone to access a file from any computer, at a remote site. It saves the time which was about to waste in copying a file from one computer to another. Many people can access or update the information stored in a database.

» **To share resources:** Some computer, devices like printers and hard disks are very expensive. Networks enable us to share such costly devices.

» **To enable people to communicate with each other:** A network allows people to communicate with each other and exchange ideas. E-mail and instant messaging help in communicating quickly.

To reduce speed and cost of transfer: As compared to traditional methods, computers or computer networks are less costy way to transfer the data.

Applications of Networking

Networking has become an indispensable part of business, industries, education and entertainment. Following are some applications:

» **Electronic Messaging:** The most popular electronic messaging service on the Internet is Electronic Mail (E-mail). We can send and receive messages to one another in any part of the world by using e-mail.

» **Electronic Data Interchange (EDI):** EDI is a method of transferring data over the Internet. It helps in business.

» **Teleconferencing:** Teleconferencing allows the people to exchange and share their ideas with each other without being physically present at the same place. It is of two types: Videoconferencing and Voice Conferencing.

1. **Videoconferencing:** Where users can see as well as talk to one another.

2. **Voiceconferencing:** Where users can only communicate simultaneously over the phone.

» **Marketing and Sales:** Computer networking is used extensively both in marketing and sales organisations. Professionals use them to exchange and analyse the data related to customer needs.

» **Electronic Fund Transfer (EFT):** EFT allows the users to transfer the money without going to a bank.

Types of Networks

Based on the inter-processor distance and size, networks can be classified as follows:

PAN

This stands for Personal Area Network. In a PAN, the devices (which can be computers mobile phones, printers, hubs, etc.) are kept within a radius of few meters from each other. The devices involved in PAN can be connected to each other using cable or wireless links (as in blue tooth). Some actions we can have with PAN is sharing of songs from a mobile to another via bluetooth. We may also transfer songs from a laptop to a mobile.

LAN E2

It stands for Local Area Network. It is the most common type of network. A LAN connects computers and devices located close to one another, such as in one building. Usually, this type of network does not consist of more than 100 computers. For example, computers connected in an office.
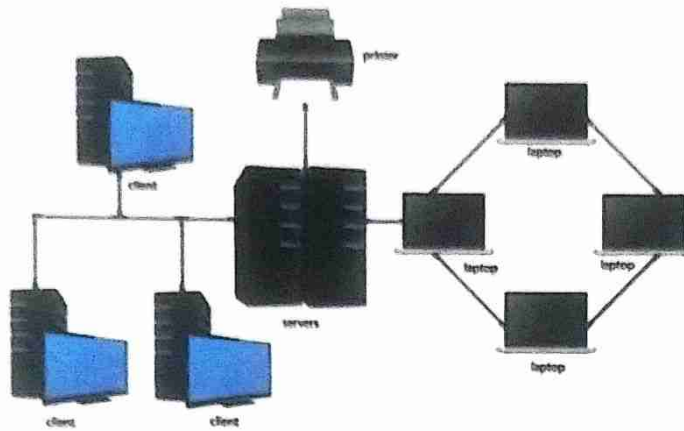
Local Area Network

CAN

It stands for Campus Area Network. As the name implies, a CAN covers a group of buildings, like in a college campus or an office campus. It is basically a collection of LANs in various buildings. This type of network is larger than a Local Area Network but smaller than Wide Area Network.
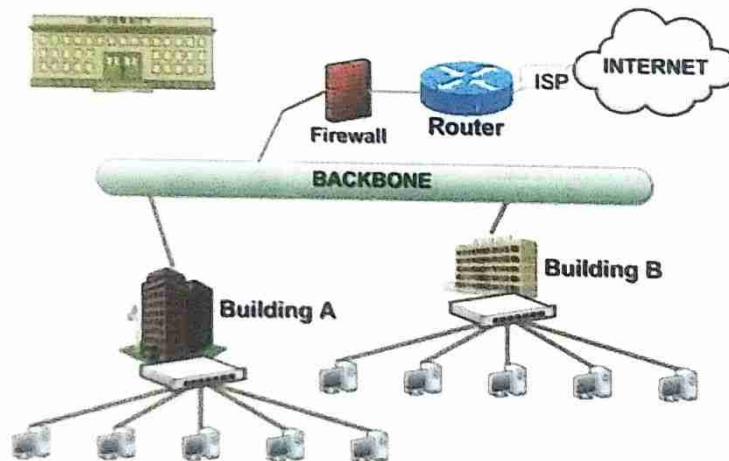

Campus Area Network

MAN

MAN stands for Metropolitan Area Network. It spans about a few kilometers. This types of network is installed in different branches of an office, in the same city.

Metropolitan Area Network

WAN E2

(It stands for Wide Area Network. This type of network may span thousands of kilometers and can encompass the entire world. The Internet is considered to be a network of computers in the world and called WAN. Evidently, WAN can span countries and even continents.)
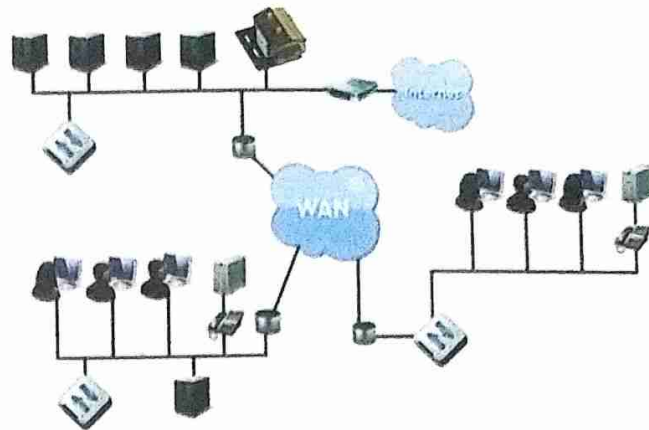

Wide Area Network

Network Topologies

(The arrangement of connected nodes on a communication network is called network layout. It is also referred to as the topology of a network. It is the geometric representation of the relationship of all the nodes to one another. There are mainly four types of topologies) They are as follows:

Bus Topology

In bus topology, all the nodes are connected to a single cable called the bus. This central cable acts as the backbone of the network. Every node communicates with other devices through this bus. However, if the backbone cable fails, the entire network goes down. In this, the source node place the data in a bus and the message is received by the intended receiver.
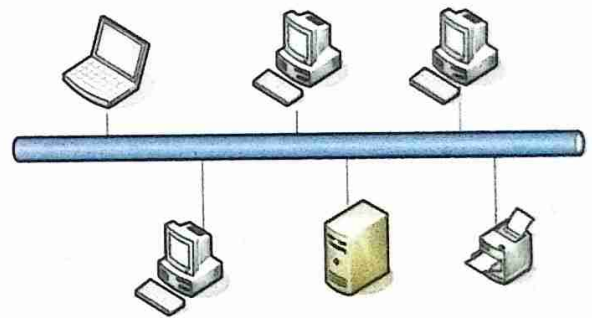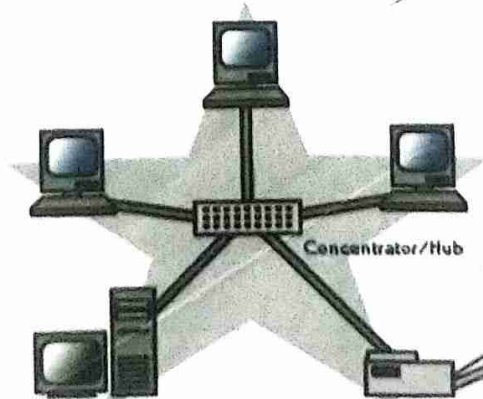

Bus Topology

Star Topology ES

(In star topology, each node is connected to a centrally located device called the hub. In this topology, all the data is transmitted through hub to the destination node. Hub manages and controls the entire network.

The failure of any node or cable in a star topology, does not cause the break down of the network. Only the failure of the central hub will cause a complete break down.)
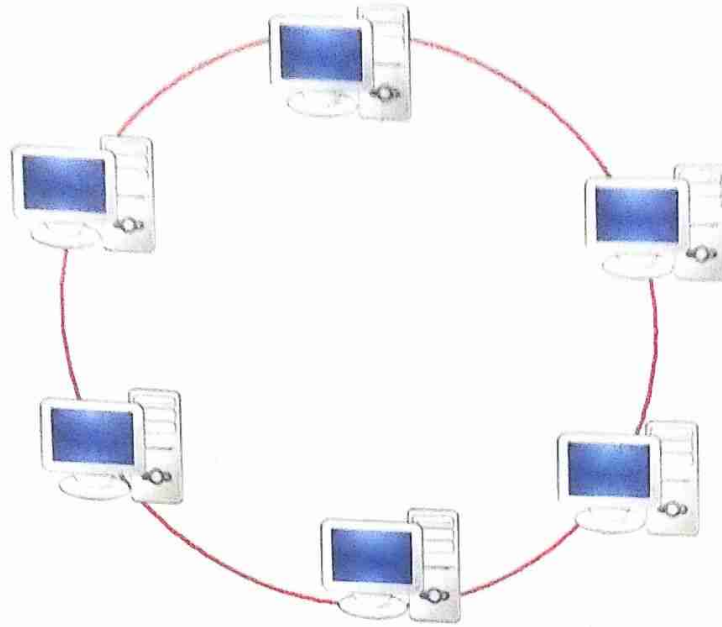

Concentrator/Hub

Star Topology
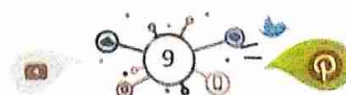
Ring Topology

(In ring topology, each node is connected with the adjacent nodes in a circular chain using a single cable. The data flows in the chain in only one direction and passes through all the nodes until it reaches its destination. This makes the network slow. If a single node or a cable breaks down, the entire network breaks down)

Ring Topology

Mesh Topology

In this type of topology, each node is connected to every other node to provide an alternative path for transferring data. This topology provides redundant interconnections among nodes. If one node does not work, then all the other nodes in a network can still communicate with each other directly through one or more intermediate nodes. It is very expensive and commonly used in a wireless network.
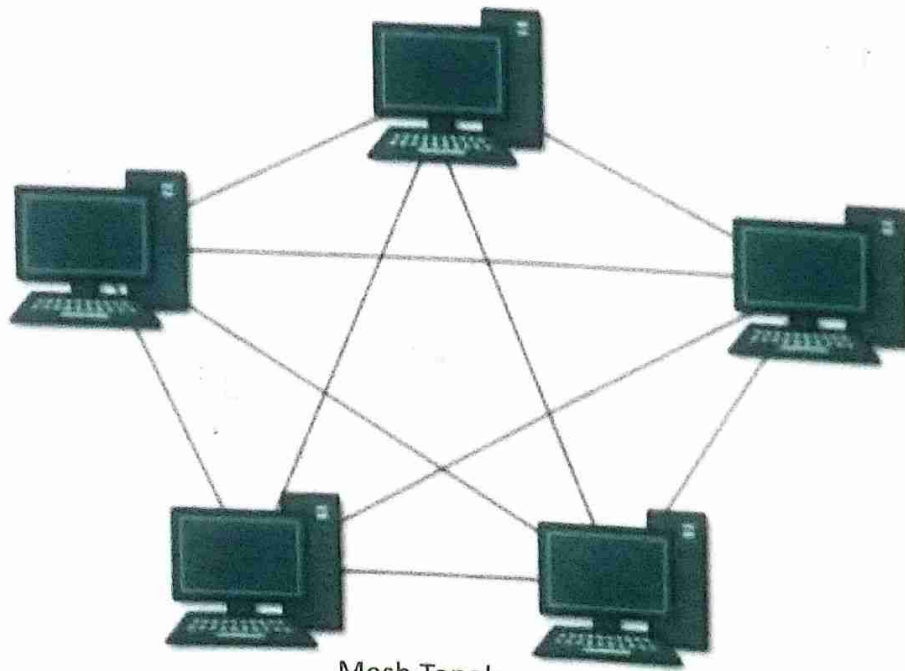
Mesh Topology
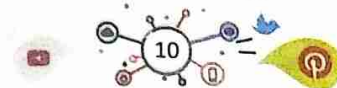
» A computer network is a collection of computers and other devices capable of communicating and sharing information with each other.

» Networking is necessary to share computer files, to share resources, to enable people to communicate with each other and to reduce the speed and cost to transfer data.

» Based on inter-processor distance and size, network can be classified as PAN, LAN, CAN, MAN and WAN.

» A Network topology is the arrangement with which computer system or network devices are connected to each other. Some common topologies are bus, star, ring and mesh.

Keywords

Network	:	A group of devices connected with one another
PAN	:	Personal Area Network
LAN	:	Local Area Network
CAN	:	Campus Area Network
MAN	:	Metropolitan Area Network
WAN	:	Wide Area Network
Node	:	Any device connected to a computer network like a computer terminal
Bus topology	:	A network in which every computer and network device is connected to single cable
Ring topology	:	All the nodes of the network are connected in a circular chain
Mesh topology	:	Each node is connected to every other node

EXERCISES

15/2/2020

A. Tick (✓) the correct one.

1. .... is the inter-connection of various devices.

   a. Chatting   b. Networking   ✓ c. Internet

2. .... spreads throughout the country or even around the world.

   a. WAN   ✓ b. LAN   c. PAN

3. In .... topology, each node is connected with the adjacent node in a circular chain.

   a. Star   b. Mesh   c. Ring ✓

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4. .... is the most common type of network.

    a. LAN   b. CAN   c. PAN

5. In star topology, each node is connected to a centrally device called ....

    a. topology   b. networking   c. hub

B. Fill in the blanks with the help of the words given in the box.

| CAN | 10 | ring | topology | communication |

1. Sharing of resources and .... are the two major reasons for networking.
2. .... is a collection of LAN in various building.
3. The inter-processor distance does not exceed .... kilometers in MAN.
4. The .... of a network is the geometric layout of computers and other devices.
5. In .... topology, failure of one node results in the failure of the entire network.

C. Write the full forms for the following:
1. LAN...
2. MAN..
3. WAN..
4. CAN..

D. Identify the topology given below.
1. Data moves in one direction only.
2. All the data is transmitted through hub to the destination node.
3. Every computer and network device is connected to single cable.
4. It provides redundant interconnections among nodes.

E. Answer the following questions.
1. What is a computer network?
2. Differentiate between LAN and WAN.
3. Write at least three advantages of using a network.
4. What do you mean by network topology?
5. What is the difference between a ring and a star topology?

LAB TIME

Visit the computer lab in your school and notice which topology is being used there for networking.