INTRODUCTION TO NETWORK

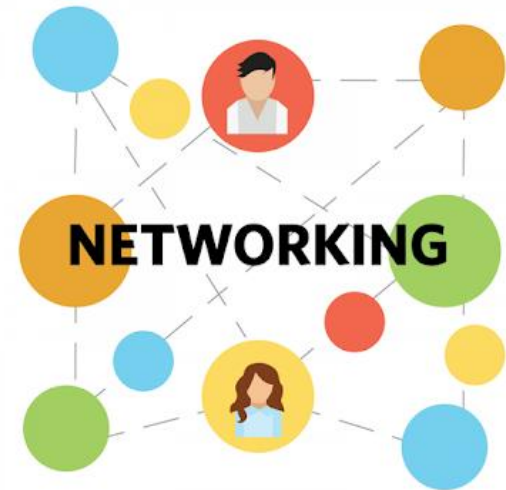Presented by

Ms.c ghufran abdulameer

Network Definition

- A network can be defined as two or more computers connected together in such a way that they can share resources.

- The purpose of a network is to share resources.

A resource may be:

- A file
- A folder
- A printer
- A disk drive
- Or just about anything else that exists on a computer

- A network is simply a collection of computers or other hardware devices that are connected together, either physically or logically, using special hardware and software, to allow them to exchange information and cooperate.
- Networking is the term that describes the processes involved in designing, implementing, upgrading, managing and otherwise working with networks and network technologies.

Advantages of networking

- Connectivity and Communication
- Data Sharing
- Hardware Sharing
- Internet Access
- Internet Access Sharing
- Data Security and Management
- Performance Enhancement and Balancing
- Entertainment

The Disadvantages (Costs) of Networking

- Network Hardware, Software and Setup Costs
- Hardware and Software Management and Administration Costs
- Undesirable Sharing
- Illegal or Undesirable Behavior
- Data Security Concerns

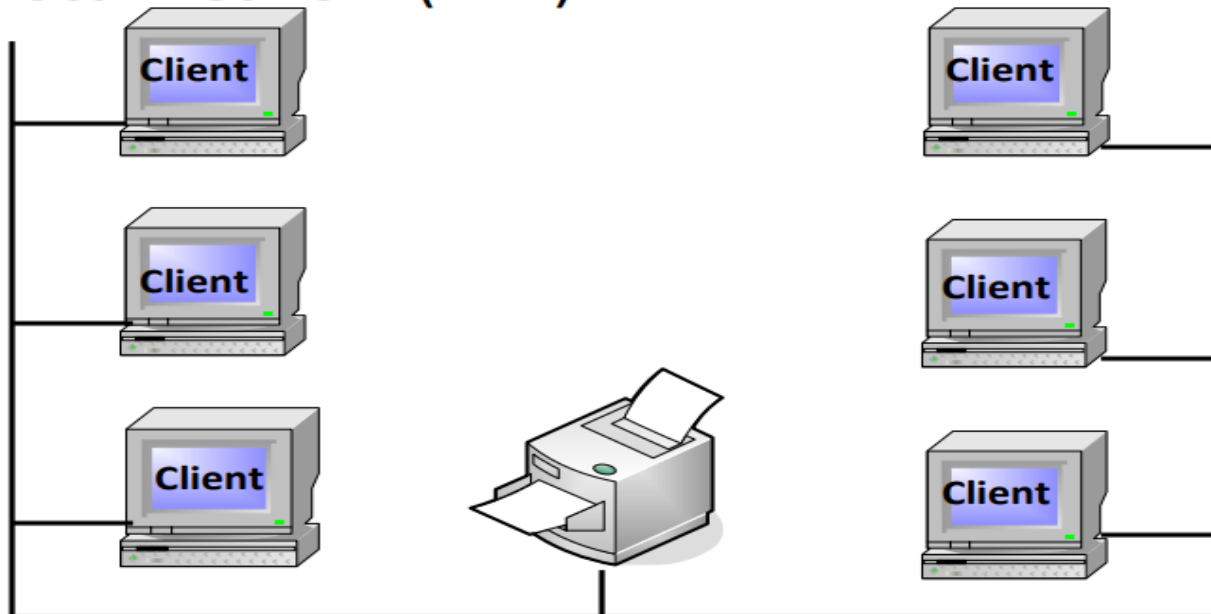# Fundamental Network Classifications
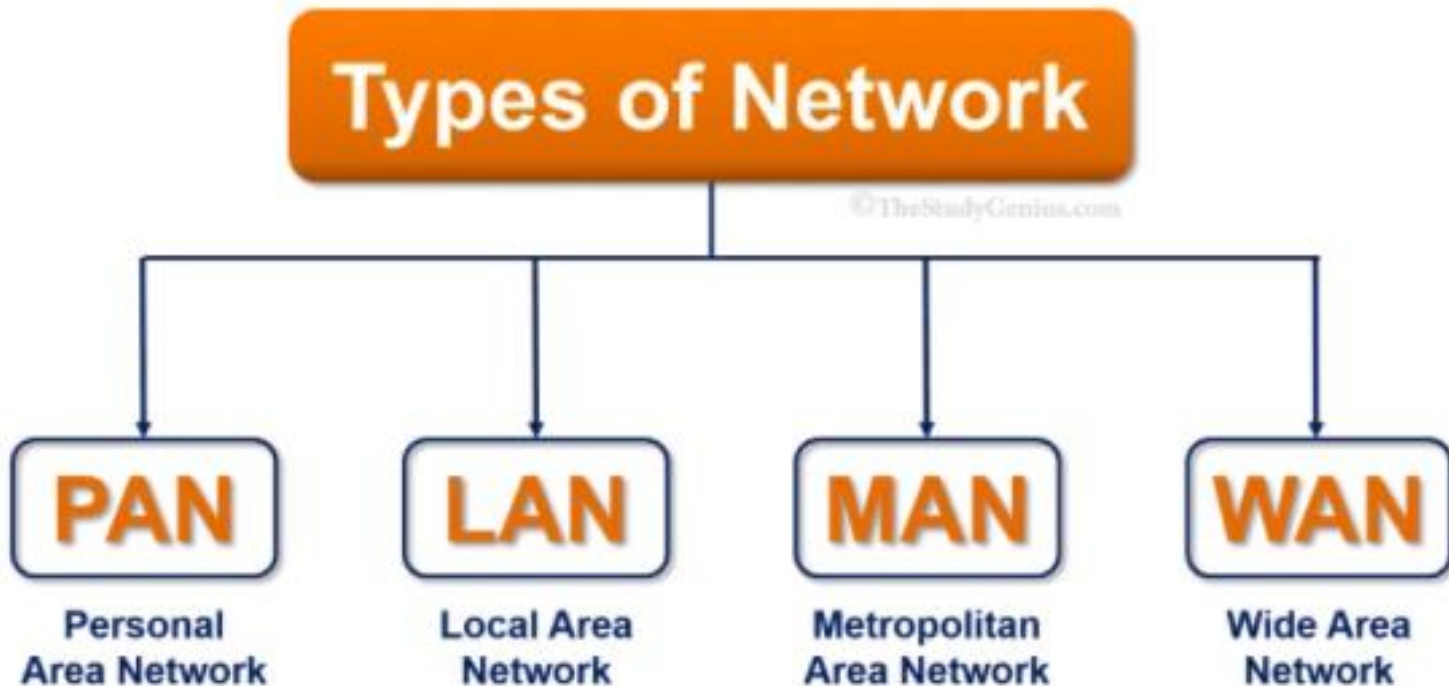
Fundamental Network Classifications

1- Local Area Networks (LANs):

• A local area network (LAN) is a computer network covering a small geographic area, like a home, office, or group of buildings
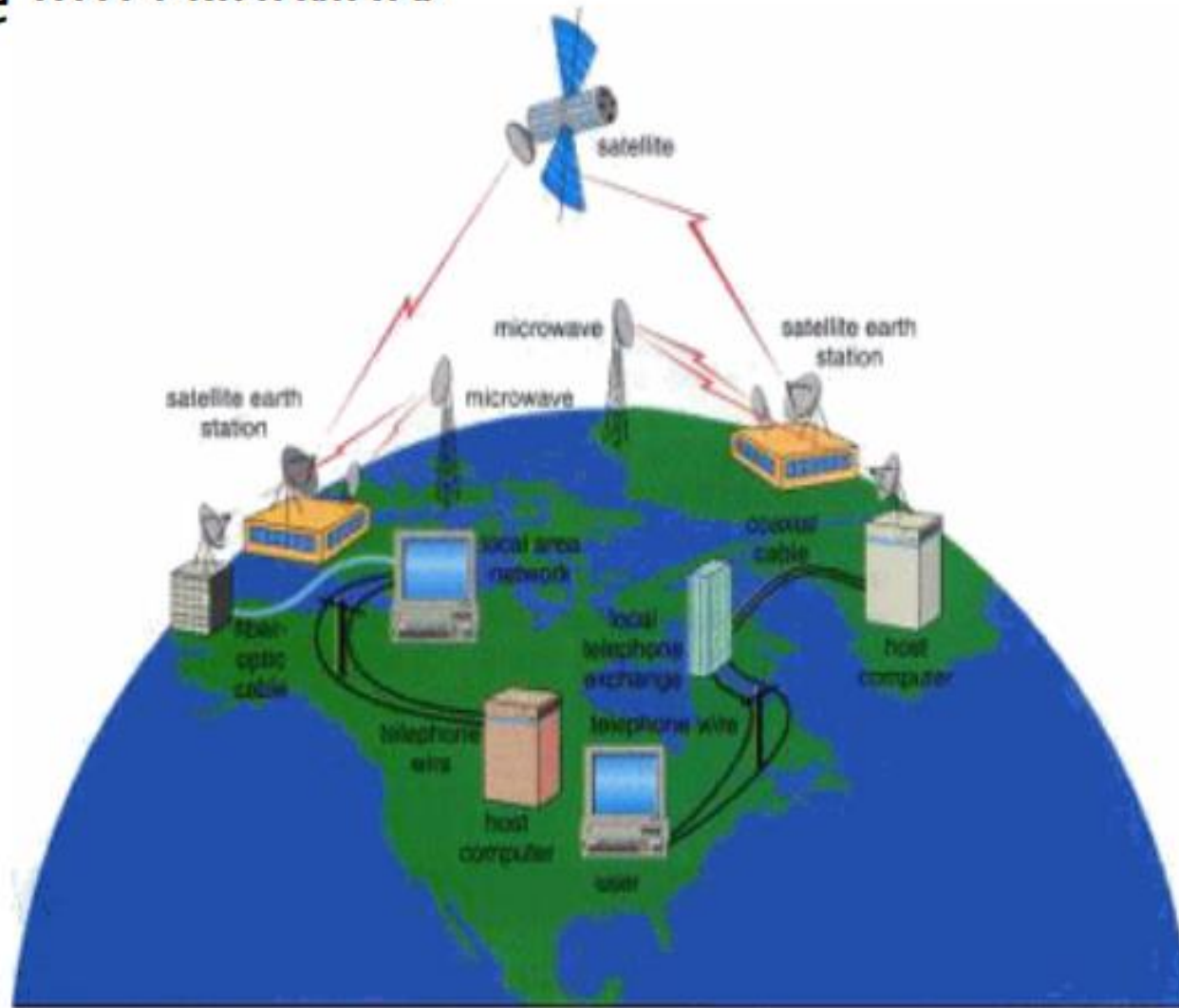

The Local Network (LAN)

2- Wide Area Networks (WANs):

- Wide Area Network (WAN) is a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries). Or, less formally, a network that uses routers and public communications links

- The largest and most well-known example of a WAN is the Internet.

- WANs are used to connect LANs and other types of networks together, so that users and computers in one location can communicate with users and computers in other locations
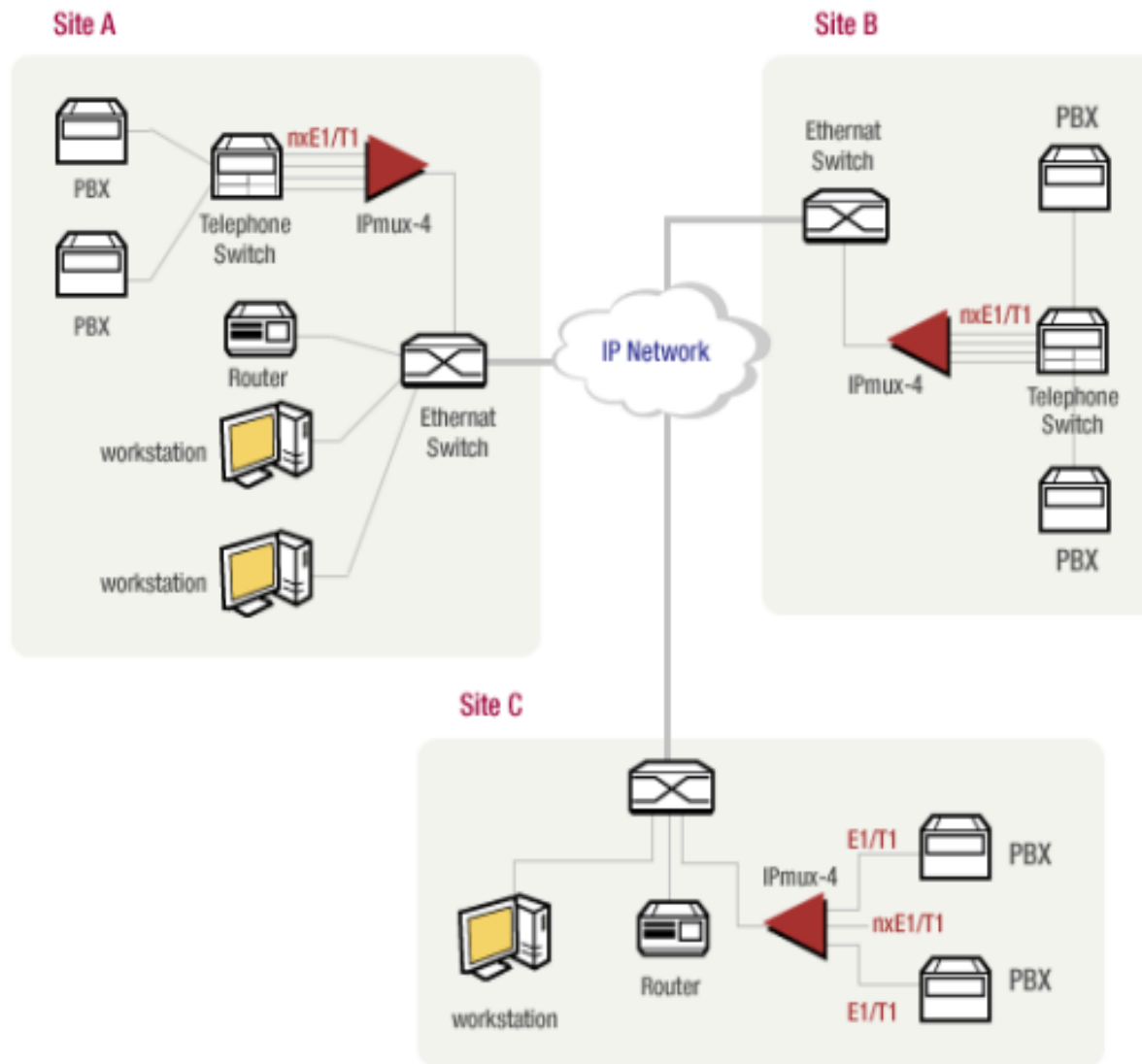
- Wide Area Network

Metropolitan Area Network (MAN):

- is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN).

- The term is applied to the interconnection of networks in a city into a single larger network (which may then also offer efficient connection to a wide area network). It is also used to mean the interconnection of several local area networks by bridging them with backbone lines.

- The latter usage is also sometimes referred to as a campus network

Metropolitan Area Network (MAN)

Personal Area Network (PAN)

- Personal Area Network (PAN) offers to make connections of multiple devices or other equipment under the single user's environment within 10 meters to 30 feet.

- These types of connections can be done wired or wireless. PAN network enables with few computer devices, telephones, video game consoles, electronic devices, laptop, PDAs, printers, smart phone, and other wearable computer devices.

Personal Area Network (PAN)

Intranet and Internet Specifications

- **Intranet:** An intranet is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network.

- **Internet:** is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers).
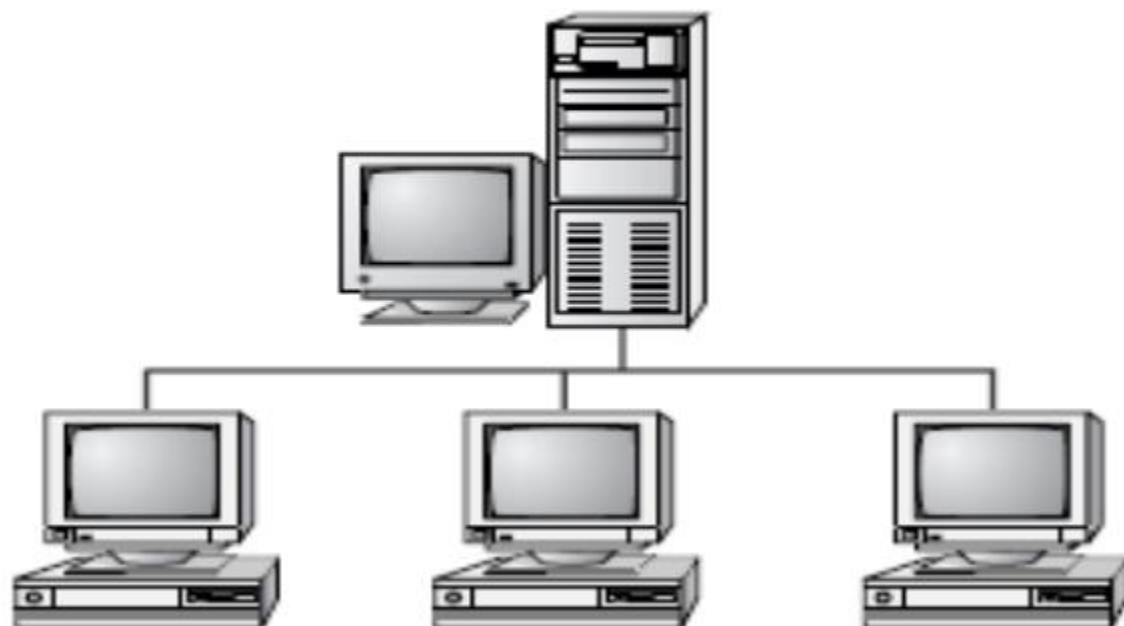
Network topology

- A topology is a way of "laying out" the network. Topologies can be either physical or logical.
- Physical topologies describe how the cables are run.
- Logical topologies describe how the network
- messages travel

- Bus (can be both logical and physical)

- Star (physical only)

- Ring (can be both logical and physical)

- Mesh (can be both logical and physical)

- **<u>Bus</u>**
- A bus is the simplest physical topology. It consists of a single cable that runs to every workstation
- This topology uses the least amount of cabling, but also covers the shortest amount of distance.
- Each computer shares the same data and address path.
- With a logical bus topology, messages pass through the trunk, and each workstation checks to see if the message is addressed to itself. If the address of the message matches the workstation's address, the network adapter copies the message to the card's on-board memory
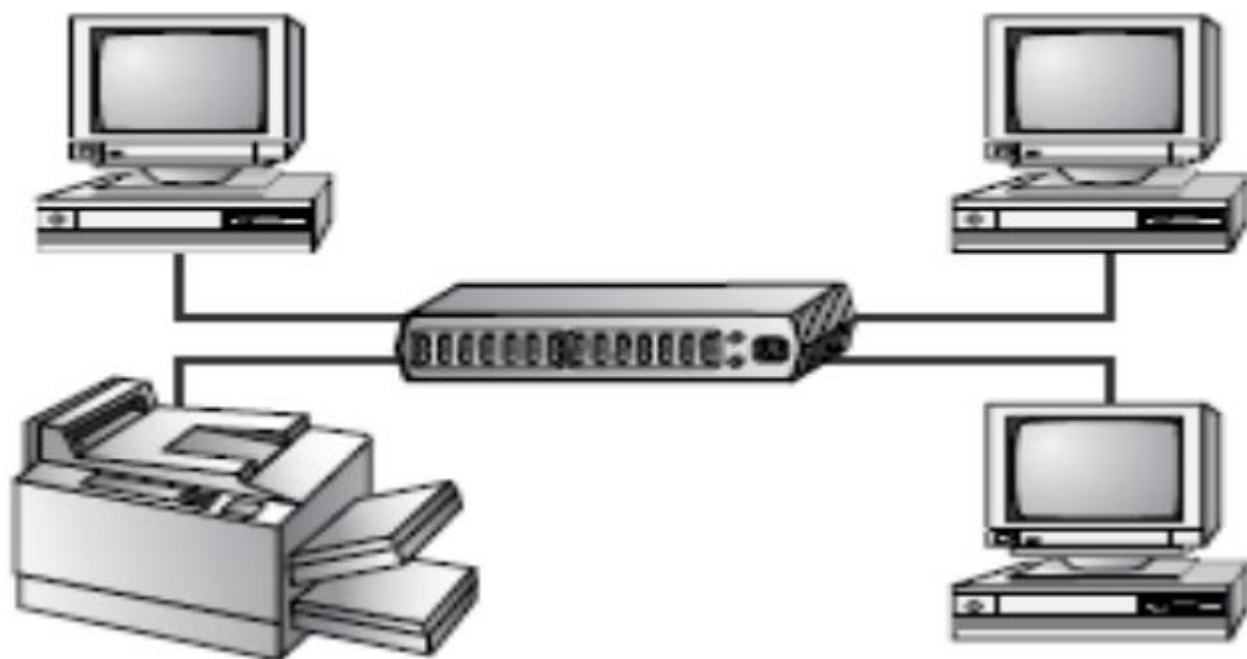
- Bus topology

- **<u>Star Topology</u>**
- A physical star topology branches each network device off a central device called a hub, making it very easy to add a new workstation.
- Also, if any workstation goes down it does not affect the entire network. (But, as you might expect, if the central device goes down, the entire network goes down.)

- Star Topology

- **<u>Ring</u>**

- Each computer connects to two other computers, joining them in a circle creating a unidirectional path where messages move workstation to workstation.

- Each entity participating in the ring reads a message, then regenerates it and hands it to its neighbor on a different network cable.

- Ring Topology

- Mesh

- The mesh topology is the simplest logical topology in terms of data flow, but it is the most complex in terms of physical design.

- In this physical topology, each device is connected to every other device

- This topology is rarely found in LANs, mainly because of the complexity of the cabling.

- Mesh Topology