

DSB International Public School
Rishikesh
Class VIII
Computer Science
CH1- About Networking

Computer Network

A **computer network** is a set of connected computers. Computers on a network are called **nodes**. The connection between computers can be done via cabling, most commonly the ethernet cable, or wirelessly through radio waves. Connected computers can share resources, like access to the internet, printers, file servers, and others.

To build a network you will need a range of equipment including the following:

1. Cables and connectors. These link together the computers, printers, servers and other equipment on your network.
2. A router
3. A network switch, hub.
4. A wireless access point (optional).
5. An internet connection.
6. A hardware firewall.

Advantages of a Network

- People can share information freely.
- Resources can be shared
- It allows for frequent collaboration.
- The cost of joining a computer network is going down.
- Computer networking data can be stored off-line.
- Anyone can connect to a computer network.
- Computer connections can be personalized.

Disadvantages of Computer Network

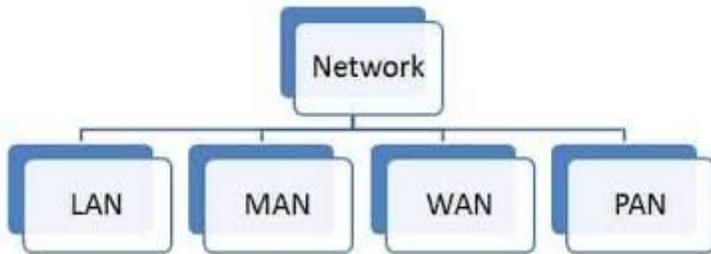
- It requires a certain wealth to join a computer network.
- Disruptions can occur frequently.
- Computer networking can be addictive.
- Information availability isn't always a good thing.
- There is little policing on a computer network.

Types of Network

There are several different types of computer networks. Computer networks can be characterized by their size. The size of a network can be expressed by the geographic area they occupy and the number of computers that are part of the network. Networks can cover anything from a handful of devices within a single room to millions of devices spread across the entire globe.

Some of the different networks based on size are:

- Local area network, or LAN
- Metropolitan area network, or MAN
- Wide area network, or WAN
- Personal area network, or PAN



Local Area Network

A **local area network**, or **LAN**, consists of a computer network at a single site, typically an individual office building. A LAN is very useful for sharing resources, such as data storage and printers. LANs can be built with relatively inexpensive hardware, such as hubs, network adapters and Ethernet cables.



Metropolitan Area Network

A **metropolitan area network**, or **MAN**, consists of a computer network across an entire city, college campus or small region. A MAN is larger than a LAN, which is typically limited to a single building or site. Depending on the configuration, this type of network can cover an area from several miles to tens of miles.



Wide Area Network

A **wide area network**, or **WAN**, occupies a very large area, such as an entire country or the entire world. A WAN can contain multiple smaller networks, such as LANs or MANs. The Internet is the best-known example of a public WAN.



Personal Area Network

A **personal area network**, or **PAN**, is a computer network organized around an individual person within a single building. This could be inside a small office or residence. A typical PAN would include one or more computers, telephones, peripheral devices, video game consoles and other personal entertainment devices.

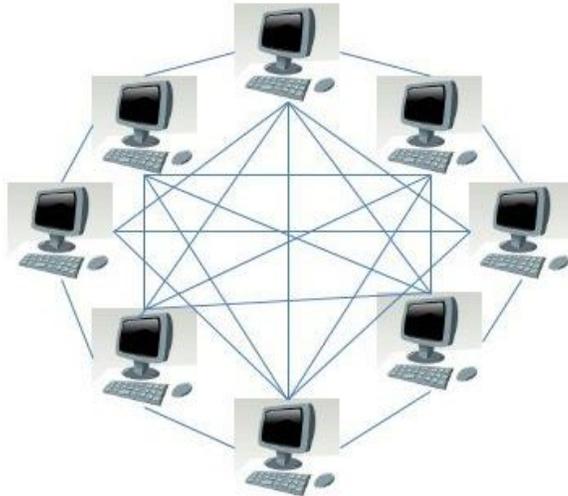


Network Architecture

There are several ways in which a computer network can be designed. Network architecture refers to how computers are organized in a system and how tasks are allocated between these computers. Two of the most widely used types of network architecture are **peer-to-peer** and **client/server**. Client/server architecture is also called 'tiered' because it uses multiple levels.

Peer-to-Peer (P2P) Network

In a Peer-to-Peer network, the "peers" are computer systems which are connected to each other via the Internet. Files can be shared directly between systems on the network without the need of a central server. In other words, each computer on a P2P network becomes a file server as well as a client. Peer-to-peer networks can be as small as two computers or as large as hundreds of systems and devices.



Peer-to-Peer Network Model

Client/Server Network

On a client/server network, every computer has a distinct role: that of either a **client** or a **server**. A server is designed to share its resources among the client computers on the network. Typically, servers are located in secured areas, such as locked closets or **data centers** (server rooms), because they hold an organization's most valuable data and do not have to be accessed by operators on a continuous basis. The rest of the computers on the network function as clients.



Client-Servers Network Model

Wireless LAN

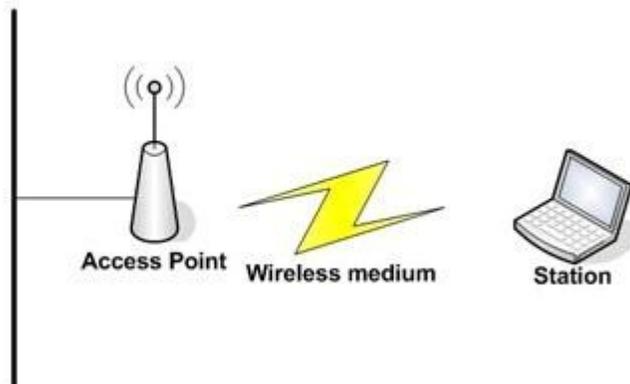
A wireless LAN is a wireless computer network that links two or more devices using wireless communication to form a local area network within a limited area such as a home, school, computer laboratory, campus, office building etc



WLAN Formation

Basic Elements of WiFi Networks

Distribution system



WLAN formation and basic elements

Every WiFi network consists of these four basic elements. The WLAN formation is formed from the following parts.

- Access point
- Distribution system
- Wireless medium
- Station

Exercise :

Multiple Choice Questions:

1. To connect computers together on a wired network we use
a) Antenna b) Switch c) CD-ROM d) Printer
2. In a wired network, an Ethernet cable is plugged into which network device:
a) Antenna b) Switch c) Network Card d) Printer

3. In this type of networking, there is no central server
 - a) Client/ Server
 - b) Peer to Peer
 - c) Client to Peer
 - d) Server to Peer
4. A computer network which covers a small area is called
 - a) LAN
 - b) MAN
 - c) WAN
 - d) PAN
5. A computer network that is spread over a large geographical area like covering many cities is called:
 - a) LAN
 - b) PAN
 - c) WAN
 - d) MAN
6. A computer network that is spread larger than LAN and smaller than WAN called:
 - a) PAN
 - b) LAN
 - c) MAN
 - d) WAN
7. In wireless networking, the wireless central point is called:
 - a) A hub
 - b) A switch
 - c) An access point
 - d) A Central Point

Write (T) for True and (F) for False, for the following statement.

1. The internet is an example of a LAN.
2. Having wireless connection in a LAN is not possible.
3. A Client/ Server architecture of a LAN contains a powerful computer called a server attached to the clients.
4. Network Interface cards are attached to computers, which are part of a network.
5. WAN is an acronym for Wings Area Network.
6. A password is an unnecessary hassle.
7. Log Off will disconnect you from the network and its resources.

Fill in the blanks.

(Nodes, Radio, Workstations, Access Point, WAN, Antenna, Password, Peer to Peer, Hubs or switches, Network Interface)

1. A network consists of two or more computers called or
2. To establish a wired network. One requires Cards, network software, and Ethernet cables.
3. LAN, MAN and are different forms of networks.
4. network has nodes connected to each other but does not have servers.
5. The is a secret word that only you and your network knows.
6. A wireless network interface card bears an
7. The wireless networking switch is also called an
8. The waves are used to form Wireless LAN

Answer the following questions:

1. What are the advantages of networking?
2. Define LAN, MAN and WAN.
3. What are the differences between Peer to Peer network and Client Server network?
4. What is wireless networking?