

# COMMUNICATION AND NETWORK CONCEPTS

## DAY – 1

### COMPUTER NETWORK

A set of computers connected together to exchange information or sharing resources.

#### ADVANTAGES

1. **Share Resources**- for example we can share one printer with many computers which are connected to each other because it would be expensive to buy printer for each computer.
2. **Share Storage**- we can access files from any computer on network.
3. **Improve Communication**- messages can be sent over internet via emails.

#### DISADVANTAGES

1. **Complex to run** – As it might require network specialist to setup.
2. **Services Unusable**- If network are badly managed then services cant be used properly and productivity might fail.
3. **File security** is important because many users can access the same file as it is connected in a network.

### EVOLUTION OF NETWORKING

The first computer network was designed by ARPA (Advanced Research Project Agency) and DoD (Department of Defence) of United States in 1969 and was called **ARPANET** which connected few computers to share resources.

### INTERNET

- It is an interconnected system of networks that connects computers around the world via Transmission Control Protocol / Internet Protocol (TCP / IP).

### INERSPACE

- It is a vision of what the internet will become where users cross-correlate information in multiple ways from multiple sources.

## COMPONENTS OF COMPUTER NETWORK

### 1. Hosts or Nodes

- It refers to the computers that are attached to a network seek to share resources of network.
- When PC, laptops, smart phones when connected to a network becomes hosts.

### 2. Server

- A computer that facilitates sharing of data, software or hardware resources on the network is called server.
- It has file or resources which are requested by client computer.
- It is a powerful computer with more processing power and more memory.

### 3. Client

- A host computer that requests for some services from server is called client.

### 4. Network Hardware

- Used to control network traffic.
- A network requires some hardware devices.

i) **NIC (Network Interface Card)**- It is a network card attached to the computer so as to establish network connection.

ii) **Connectivity Devices**- Hub, switch, router etc.

### 5. Communication Medium or Channel

- Nodes in a network interact with each other through communication medium or channel which can be wired or wireless.
- It is of two types:
  - i) **Wired Communication Channel**- When hosts and server are connected with each other through guided media like network cables. Ex- Twisted Pair Cable, Coaxial cable, Fiber Optics Cable etc.
  - ii) **Wireless Communication Channel**- When hosts & server are connected with each other through unguided media without wires. Ex- Microwave, Radiowave, Satellite etc.

### 6. Software

- Software layers of network comprises of network protocol, network operating system etc.
- i) **Protocol**- Pre-decided set of rules using which network connect & interact with each other.

**ii) Network Operating System-** It handles networking tasks done by networking devices such as router, switch etc.

## 7. Network Services

- Applications that provides different functions over a network such as DNS (Domain Name System), File Sharing, VoIP (Voice over Internet Protocol ).

## TYPES OF NETWORK

### I. Types of Networks based on Geographical Spread

LAN	MAN	WAN
It connects group of computers within limited geographic area upto 100 to 1000 metres.	It covers the area such as state or city upto 100 km.	It covers huge area all over the world.
Very less cost to setup.	Costs higher than LAN.	Costs higher to setup.
Speed to transfer the data is fastest.	Speed to transfer the data is slow.	Speed to transfer the data is slowest.

#### 1. LAN (Local Area Network)

- It is a network that connects computer in a limited geographical area such as home, school, office building etc.
- A LAN is useful for sharing resources like file, printer etc.
- We use Ethernet cables, hubs etc to create a local area network.

#### 2. MAN (Metropolitan Area Network)

- It is a computer network that usually covers large area than a LAN.
- It covers a large area (5 to 50 km).
- A MAN is typically owned and operated by a single entity such as a government body or large organisation.

### 3. WAN (Wide Area Network)

- It is a computer network that covers a large geographical area such as city, country or continents.
- WAN often connect multiple smaller networks like LANs and MANs.
- Internet is the example of WAN.

### 4. PAN (Personal Area Network)

- It refers to the small network of communication.
- It is a computer network organized around an individual person like data sharing through Wi-fi and hotspot.

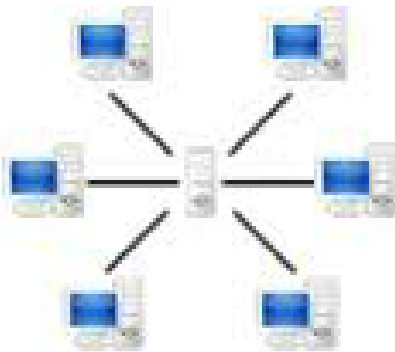
## II. Types of Networks based on Component Roles

PEER TO PEER NETWORK	CLIENT SERVER NETWORK
No central control over security.	Server controls the security of network.
Clients are not dependent on central server.	Clients are dependent on server.
Each computer has to be backed up.	Data is backed up on main server.

**PEER TO PEER NETWORK:** They are popular as home network & for use in small companies as they are inexpensive, easy to install, but are limited in scope and difficult to secure.

**CLIENT SERVER NETWORK:** Client computer request and utilizes network resources while server computer process the request of clients.

A server based network



A peer-to-peer based network.

