

# Network

**Networking**: It's a connection between two or more machines to communicate with each other.

## **Network components:**

- NIC (Network Interface Card)
- Media
- Topology
- Protocol
- IP Addresses

## **Basic requirements for Networking**

### **NIC (Network Interface Card):**

- It is a computer hardware component that connects a computer to a computer network.
- Each NIC will have a unique MAC address to avoid conflicts b/w same NIC adapters.
- We represent these by the word "eth" or "ens".

**Media**: It is a medium via which two different computer's NIC card will be connected.

E.g: RJ 45

**Topology:** Design in which the computers in the network will be connected to each other.

Eg : Bus, Ring, Star, Mesh and Tree

**Protocol:** Defines rules and conventions for communication b/w network devices.

## **Protocol (Ports)**

### **TCP/IP:**

- Transmission Control Protocol
- It is connection oriented
- TCP acknowledgement will be sent/received
- Slow Communication
  - Eg: HTTP, HTTPS

### **UDP:**

- User Datagram Protocol
- Connectionless
- No Acknowledgement for UDP
- Faster Communication
  - Eg: DNS, DHCP

## IP Addresses

**IP Address**: An Internet Protocol **address** is a numerical label assigned to each device connected to a computer network for communication.

Eg : Like Phone number

- IP range is 0.0.0.0 – 255.255.255.255
- This is what we call IPv4 (Version 4)

For easy identification purpose, we have divided entire IP range into 5 Classes

- Class A: - 0.0.0.0 – 126.255.255.255
- Class B: - 128.0.0.0 – 191.255.255.255
- Class C: - 192.0.0.0 – 223.255.255.255
- Class D: - 224.0.0.0 – 239.255.255.255 (Reserved for Multicast purpose)
- Class E: - 240.0.0.0 – 255.255.255.255 (Reserved for R & D)
- 127.0.0.0 – 127.255.255.255 (Loop back address) (We use this for testing purpose)

### Public IP (Vs) Private IP

- Public IP is used for external communication
- Private IP is used for internal communication
- No two machines in one organization should have same Private IP

- Two machines in two organizations can have same Private IP
- No two machines in this world should have same public IP
- Public IP will be assigned by Internet service provider
- Every time you change Internet service provider, your machine will get new Public IP
- Private IP will be assigned by default when you buy a machine