LECTURE 3

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IP Address

IP ADDRESS

IPv4 → 32 bit
IPv6 → 128 bit

IP Addresses are the identifiers that allow information to be sent between devices on a network.

IPv4:

→ Every node in the **computer network** is identified with the help of an IP address.

→ Logical address (*can be changed*).

→ Can change based on the location of the device.

→ Assigned **manually** or **dynamically**.

→ Represented in decimal & it has 4 octets (x.x.x.x).

→ 0.0.0.0 to 255.255.255.255 (32 bits).

MAC Address

Basic MAC Addressing

→ MAC stands for **Media Access Control**.

→ Every node in the **LAN** is identified with the help of a MAC address.

→ **Unique** → **Cannot be changed**.

→ Assigned by **Manufacturer**.

→ Represented in **Hexadecimal**.

- → Example: **70-20-84-00-ED-FC (48 bits)**.

IP Address VS MAC Address

IP Address	MAC Address
32 bits	48 bits
Logical address (can be changed)	Unique (cannot be changed)
Assigned by manually or dynamically.	Assigned by manufacturer.
Routers need IP address to forward data.	Switches need MAC address to forward data.
Represented in decimal.	Represented in Hexadecimal.
Example: 10.10.23.56	**Example:** 70-20-84-00-ED-EE

Port addressing

IP address = Location of a person,
MAC address = Name of the person.

Basic of Port Addressing

→ Suppose a parcel comes from Dhaka to Chittagong

✓ Reaching our city = Reaching our network (IP address)

✓ Reaching our apartment = The host (MAC address)

✓ Reaching the right person = The right process (Port address)

Port Address and Port Number

Port Address OR Port Number

→ In a node, many processes will be running.

→ Data that are sent/received must reach the right process.

→ Every process in a node is uniquely identified using **port numbers**.

→ **Port** → Communication endpoint.

- → Fixed port numbers & dynamic port numbers (**0 - 65535**).