PAGE No
DATE / /

Lecture 9 → Basics of IP Addressing..

(1) IP Address → Internet Protocol Address.

→ Every node in computer networks is identified with help of IP address.

Eg:- 172.15.150.2

(2) 2 types → IPv4 and IPv6 (discussed later).

IPv4 characteristics

→ Every node has an IP address
→ Can change for a device based on it's location
→ Assigned manually (or) dynamically.
→ Represented in decimal [0.0.0.0 to 255.255.255.255 (32bit) address.

(3) In a real device. → ip config command in cmd gives the ip-address.

Lecture 10 → Basics of MAC Addressing

(1) MAC → Media Access Control.

Every node in LAN is identified with help of MAC address.

Eg:- 70-20-84-00-E5-PC.

PAGE No.
DATE / /

(2) MAC address → Name of device.
(LAN)
IP address → location of device

(3) ⇒ IP addresses are router friendly and mac address are switch friendly.

(4) ⇒ Characteristic of MAC

→ Every node in LAN identified with help of MAC address.
→ Unique, cannot change.
→ Assigned by manufacturer. (48 bits).
→ Represented in hexadecimal. [70:20:84:00:E5:Fc].
↳ for seperation (:), (-) or (.) can be used.

(5) To see Mac address in device → in cmd, give
ipconfig/all.

Lecture 11 → Basics of Port Addressing.

(1) ⇒ After the LAN(switch) identifies device using MAC address, the package should also reach right process.

(2) ⇒ Also called Port numbers. → Dynamic (new process).
→ fixed (predefined)
→ port number vary from (0 — 65535)

realder
[resmon]

Eg:- chrome browser requesting youtube.com.
[one of the process].

PAGE No
DATE / /

Lecture 12 → Switching Techniques in Computer Networks.

Switching.

① Helps in deciding the best route for data transmission. if multiple paths are present in a large network.

② Techniques → Circuit Switching
→ Message switching.
→ Packet Switching → Datagram
→ Virtual circuit

③ Circuit Switching. (Telephones). → A dedicated path is established b/n sender and receiver, and before the data transfer connection established first.

3 phases → Connection establishment (Path decided).
→ Data transfer
→ Connection disconnection.

④ Message Switching
→ Store & Forward mechanism.
→ Not suited for streaming or real time applications.

Broke down, forwarded and when all detected at node then forwarded again.

PAGE No
DATE / /

(5) Packet Switching

→ Like message switching, the message/package is broken down into small chuncks but unlike message switching, small chunck sent as a packet not stored in nodes.

→ Each packet, ∴ should have source & destination IP address & sequence numbers.

↳ Helps receiver to Reorder, ~~check missing packets~~ & send acknowledgement.

→

Datagram	Virtual Circuit
(1) Connectionless Switching.	(1) connection oriented switching.
(2) Path not fixed, decided by intermediate nodes.	(2) Preplanned route before message is sent.
(3) Each independent chunck called datagram.	(3) Call accept & call request used to develop connection.

PAGE No
DATE / /

Lecture 13 — Layering in Computer Networks.

(1) Layering → Breaking the problem into more manageable components (layers).

[Easier to troubleshoot].

⇒ Layered Architectures → OSI Reference Model
→ TCP/IP Model.

(2) OSI Model (Reference).

⇒ Open System Interconnection.

→ Not a protocol, just a guideline, hence called OSI reference model.

→ Flexible, robust & interoprable.

→ Irrespective of diff hardware & software doesn't matter

(3) TCP/IP Model

Transmission Control Protocol / Internet Protocol.

Developed before OSI model.

TCP/IP is a hierarchical protocol.

PAGE No
DATE / /

Lecture 14,15,16,17 → OSI Reference Model.

14

(1) Layers → 7 →
- Application
- Presentation
- Session
- Transport
- Network
- Data Link
- Physical

Please DoNt Throw Sausage Pizza Away

(2) Any data/packet, has to pass all layers on every device
(PCs (7 layers)), (3 layers in intermediate nodes (Layer 3). [for addressing])

Sender (7 to 1)
Receiver (1 to 7)

15

(3) Application layer

→ Enables the user to access network resources.

- File transfer & Access management.
- Mail services, Directory services. (Eg: internet)

} Services

(4) Presentation layer → what do first 8 bit represent, next 8 bit.

→ Concerned with the syntax and semantics of the information exchanged b/n systems. → what section represent what.

Translation
Encryption
Compression

} → into a format accepted by receiver. Services.

(5) Session layer → Establishes, maintains and synchronizes the interaction among communication devices

Dialogue control. } Services.
Synchronization }
→ Allows comm devices to enter into dialog. (half duplex or full)

16.

(6) Transport layer.

→ Responsible for process to process delivery of the entire message.
[Even specific them computer to computer].

Connectionless or connection:
Port addressing
Connection control
Segmentation & Reassembly → for very big messages broken.
End-to-End flow control
Error control
} Services.

(7) Network layer

→ Responsible for delivery of data from original source to destination network.

Logical addressing → IP addressing.
Routing
Finding best route for packet to reach.
} Services

(8) Data link layer → Moving data (frames) from one node to other.

→ Grouping 0 and 1s.

Framing.
(MAC) Physical addressing.
Flow control.
(who is master) Access control.
Error control.

} Services.

(9) Physical layer → Responsible for transmitting bits over a medium. It also provides electrical & mechanical specifications.

⇒ medium can be wireless / wired.
Converts data (0s & 1s by data link layer) to electrical (or) light signals. or waves.

Transmission (Half, Full duplex).
Representation of bits
Data Rate
Physical characteristics of bits
Line configration
Physical Topology

} Services.

17.

(10) Recap & An Example shown.