T. YASHWANTH
CSE-D
AM.EN.U4CSE17340

TUTORIAL

1. Ethernet is connectionless. Upper layer protocols like TCP establishes connection. Connection is implemented through software and connection oriented ethernet is also there but by default ethernet is connectionless

2. 2^{48} MAC address
   2^{32} IPV4 address
   2^{128} IPV6 address

3.

(d) (i) Forwarding table in A determines that the datagram should be routed to interface 111.111.111.002

(ii) The adapter in A creates and ethernet packet with ethernet destination address 22-22-22-22-22-22

(iii) The first router receives the packet and extracts the datagram. The datagram is routed to 122.22.22.0

(iv) The first router sends the ethernet packet with the dest. add 55-55-55-55-55-55 and src add of 33-33-33-33-33-33 via interface with IP 122.222.22.002

(v) Process continue until packet reaches host F.

(e) ARP in A must now determine the LAN address of 111.111.111.002. Host A sends out an ARP query packet within a broadcast ethernet frame. The first router receives the Query packet and sends host A and ARP response packet. This ARP packet is carried by ethernet frame and ethernet destination

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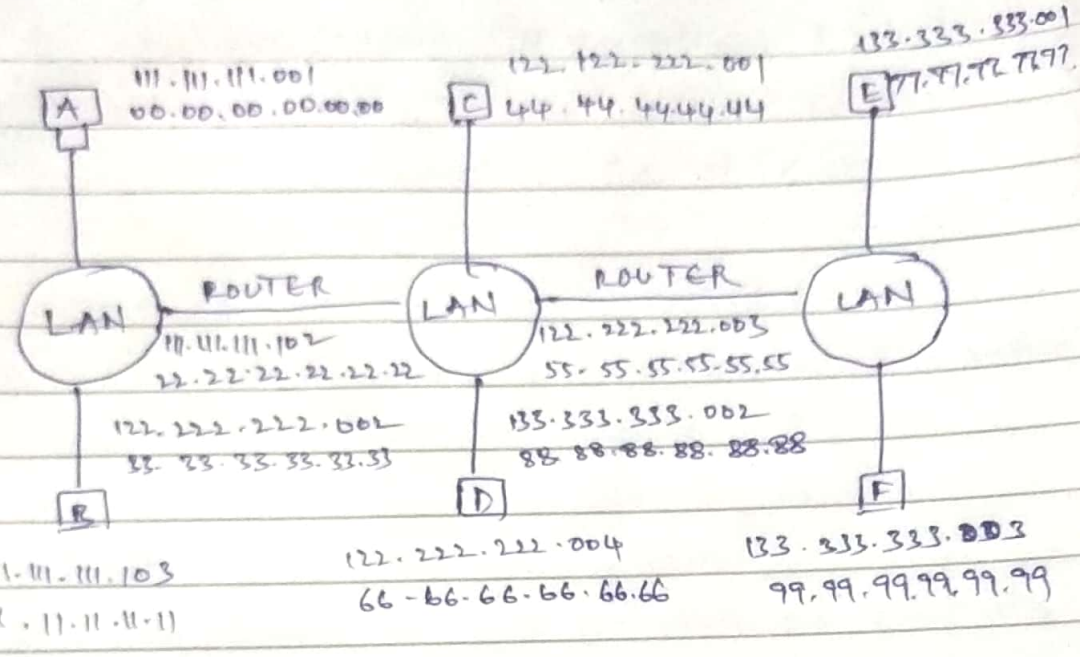
address 00.00.00.00.00.00.

a, b, c ⇒



4. In order to send an IP datagram the sender must know both IP and MAC. In order to know the unknown MAC the sender will send ARP query as a broadcast message across the LAN. Each node will receive this msg and determine that it is a broadcast message. The adapter will then send the msg. up to its own ARP module. Each ARP module checks to see if that IP address matches its IP address. If it close, it will send ARP response back to sender with MAC inside a frame of packet.

5. c's adapter will process the frames, but the adapter will not pass the datagrams up the protocol stack. If the LAN Broadcast address is used, the c's adapter will both process the frames and pass the datagrams up the protocol stack.

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6. → An IP datagram send from the source host to the destination host will travel over 3 interfaces.
→ 3 forwarding tables will be indexed to move datagram from source to the destination.

7.

CSMA/CD	CSMA/CA
1. CSMA/CD is effective after a collision.	1. CSMA/CD is effective before collision.
2. It is used in wired networks.	2. Commonly used in wireless.
3. It is only reduced to recovery time.	3. Minimizes the possibility of collision.
4. Resend the data frame whenever conflict occur.	4. Will first transmit the intent to send for data.
5. Is more efficient than simple CSMA.	5. Will it is similar to simple CSMA.

8. $(0 \text{ to } 2^k - 1) \times RTT$

10. → $P(x) = x^3 + x^2 + x^0 \ (1101)^3$

$G(x) = x^6 + x^3 + x^2 \ (1001100)$

Multiply by no. of bits in CRC polynomial

$x^3 (x^6 + x^3 + x^2)$

$x^9 + x^6 + x^5 \ (1001100000$

We divide and determine the remainder, the result is 001. So the transmitted is

1001100 001

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11. - Suppose two nodes start to transmit at the same time a packet of length L over a broadcast channel of rate R.
- The propagation delay b/w the two nodes as dprop.
- If transfer noded at sametime, then receive the bits of packet from another node.
∴ Collision is occured.

T. Yoga