

Network Assignment

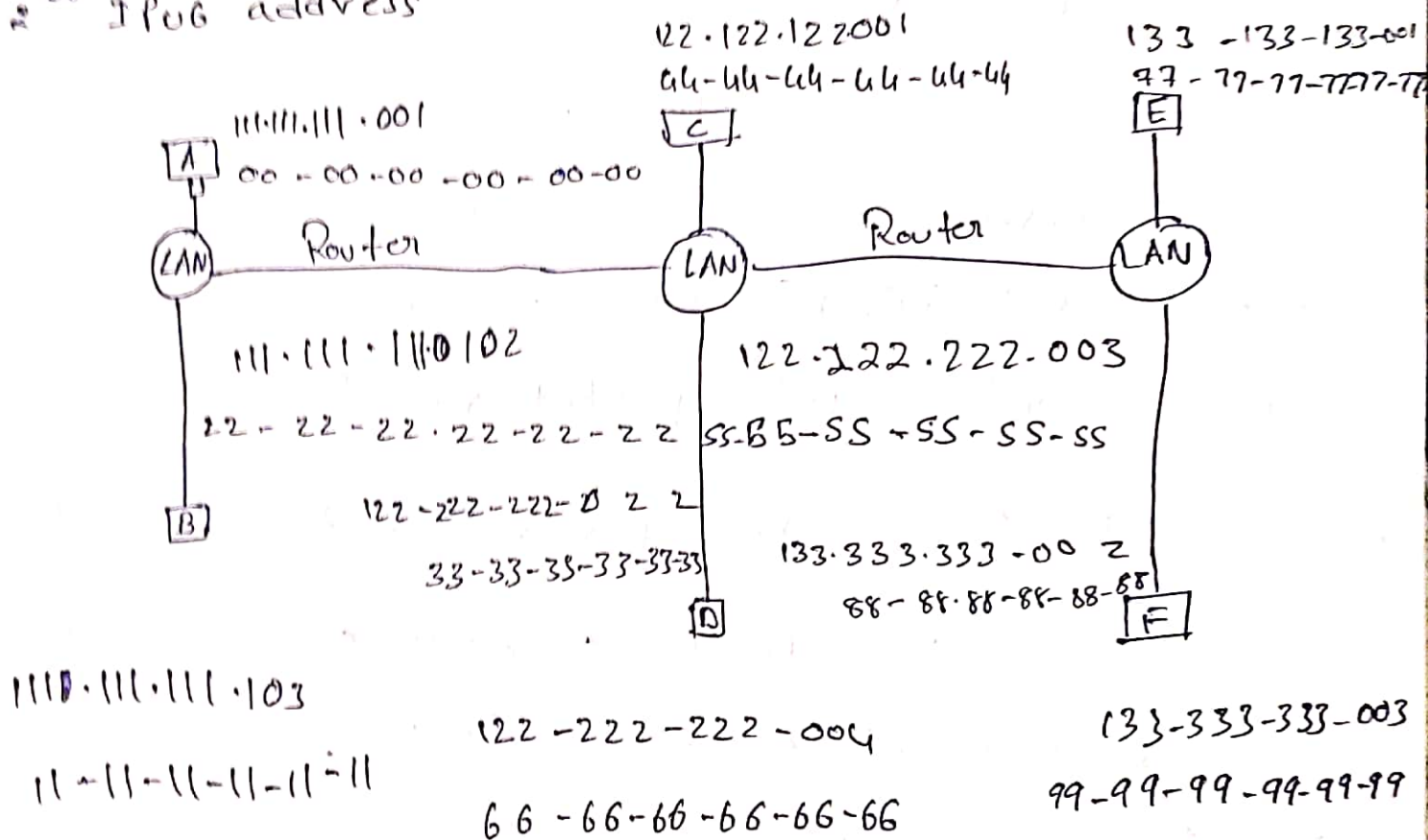
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1) Ethernet is Connection less upper layer protocols like TCP establishes Connection Connection is implemented. Through software & Connection opened ethernet is also there but by default ethernet is Connection less.

2) 2^{18} MAC address

2^{32} IP v4 address

2^{128} IP v6 address



- 3)d) i) Forwarding table in A determines that the datagram should be routed to interface 11.11.11.021
- ii) The adapter in A creates an 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 the 22.222.222.0
- iv) The first router sends the ethernet packet with the destination address ss-ss-ss-ss-ss-ss source address of 33-33-33-33-33-33 via interface with IP 122-222-222.02.
- v) Process continues until packet reaches host P

E) ARP in A must now determine the ~~laison~~ Address of 11.11.11.002. Host A sends out an ARP query packet within a broadcast ethernet frame. The first router receives the query packet and sends hosts A an ARP response packet.

~~is carried~~

This ARP Packet is carried by ethernet frame and ethernet destination address 00-00-00-00-00-00

- a) 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 message and determine that it is a broadcast message the adapter will then send the message up to its own ARP module. Each ARP module checks to see if that IP address matches its IP address if it does it will send the ARP response back to sender with the MAC inside a frame or packet.

5) c's adapter will process the frames but the adapter will not pass the datagram's up the protocol stack.

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

CSMA/CD	CSMA/CA
→ It is effective after the collision	→ It is effective before collision.
→ used in wired networks	→ commonly used in wireless
→ only reduced to recovery time	→ minimizes the possibility of collision.
→ Resend the data frame whenever the conflict occur	→ will first transmit the intent to send for data frame.
→ more efficient than simple CSMA	→ It is similar to simple CSMA.

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

10) \Rightarrow The physical address doesn't change.

\Rightarrow The IP address may need to be changed to reflect a new subnetwork ID and host ID.

\Rightarrow The solution is same for laptop.

$$\rightarrow p(x) = x^3 + x^2 + x^0 \text{ (1101)}$$

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

multiply by the number of bits in the CRC polynomial

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

$$x^{12} + x^9 + x^8 \text{ (1001100 000)}$$

$$\begin{array}{r} 1101 \overline{) 1001100000} \\ \underline{1101} \\ 1001 \\ \underline{1101} \\ 1010 \\ \underline{1101} \\ 1110 \\ \underline{1101} \\ 1100 \\ \underline{1101} \\ 001 \end{array}$$

$$1001100 \boxed{001}$$

11) \rightarrow Suppose two nodes start to transmit at the same time a packet of length L over a broadcast channel of rate R .

\rightarrow The propagation delay between the two nodes is d_{prog} .

\rightarrow If transfer node at same time, then receive the bits of packet from another node while

$$d_{\text{prog}} < L/R$$

\therefore The collision is occurred.