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2120322

Sec - 22

3) a)

Source IP = 16

Destination IP = 12

Source port = 49152

Destination port = 80

Source MAC = H

Destination MAC = J

Type → well known port [server port]

- 2) Cookies improve user experience by keeping a user logged in across page requests so that users do not need to reauthenticate on every click. They also store user preference language. Then non identifying cookies also let sites remember where users left off. Cookies also help servers serve fast cached content optimized per user.
- 3.) The email client was configured to use POP3 and was set to delete messages from server after download. POP3 downloads messages into the local client mailbox and removes them from the server so other services on webmail no longer see them.
- 4) The owner of the connect site can register common type domains and set a DNS A or CNAME record pointing to the same IP or host as google.com. When we request google.com our DNS resolver goes to the A record or CNAME and we reach the intended web server which can then redirect or serve content.

So DNS maps simple resources names to IPs. The mapping $\text{www.google.com} \rightarrow \text{IP_A_www.google.com}$ happens ~~only~~ if google.com is configured to point to the same IP or to redirect.

- 5) The receiver advertises in each ACK how much free buffer space it currently has. The sender limits how many bytes it has to have to the last advertised ~~now~~ round. If window becomes small or zero the sender must pause sending until the receiver advertises more space. The window slides forward as the receiver consumes buffered data and acknowledges it. The sender increases bytes accordingly. Therefore sender never ~~is~~ overwhelms receiving buffer. The receiver does not need to drop segments due to overflow.

6) Subnet mask = 255.255.224.0 /₁₆ = 255.255.0.0 /19
 means 3 bits into third octet
 Network address = 173.192.192.6
 third octet 221 decimal \rightarrow binary 1101101. keep top 3 bits 110 \rightarrow 142 in third octet.

Broadcast address = 173.192.223.255

Range covers third octet 142-223 broadcast is 255 at end.

Subnet = 173.192.255.255.224.0

Network = 173.192.192.0 /19

Broadcast = 173.192.223.255

a) Total RTT = 480 ms.

One way = 15

$\therefore RTT = 2 \times 15 = 30 \text{ ms}$. obj size = 10 MB

No of obj = $\frac{480}{30} = 160 \text{ objects. (A)}$

b) $10 \text{ MB} = 10 \times 8 = 80 \text{ M bits}$

Time = $\frac{80}{80} = 1 \text{ s} = 1000 \text{ ms (A)}$

8) a) S1 starts at 5044 length 399 \rightarrow next = $5044 + 399 = 5443$

S2 starts at 5443 11 120 \rightarrow next = $5443 + 120 = 5563$

S3 starts at 5563.

Client bytes sent so far to be acknowledged by server

$$01(125) + 02(244) = 369 \text{ bytes after seq 1024}$$

\rightarrow next expected client

$$\text{byte} = 1024 + 369 = 1393$$

$$\text{seq no} = 1393 \text{ ack} = 1393$$

b) ACK-1 is the client ACK after receiving S1

After S1 the next server byte is $5044 + 399 = 5443$.

so client ACK = 5443.

$$\text{ACK-1 ack} = 5443$$

c) Under selective repeat the receiver acknowledges

each segment independently by sequence number

of next byte after that segment. S3 starts at 5563 and is 40 bytes long \rightarrow next byte = $5563 + 40 = 5973$

$$\text{so ACK-3} = 5973$$