

Ans: to the Qus: No: 01

a)

Source IP	Destination IP	S. Port	D. Port	S. MAC	D. MAC
0	14	49152	80	C	D

b) The destination port in (a) is a well-known port (server port).

Ans: to the Qus: No: 02

The field / value of the HTTP response message that can be used to deduce the problem is the HTTP status code. A status code in the 4xx or 5xx range would indicate a client-side or server-side error, respectively. The HTTP method that can be used for troubleshooting is the HEAD method, which requests a response identical to a GET request but without

the response body. This allows you to check the status code and headers without downloading the full content of the page.

Ans: to the Qus: No: 03

An iterative DNS lookup can be faster than a recursive DNS lookup if the client already has some of the intermediate DNS server addresses cached. In a recursive lookup, the client waits for the final answer from the local DNS server, which performs all the lookups. In an iterative lookup, the local DNS server provides ~~ref~~ referrals to other DNS servers, and the client directly queries them. If the client has cached the

addresses of the authoritative DNS servers for a domain, it can bypass the initial queries to the root and TLD servers, resulting in a faster response.

Ans: to the Qus: No: 4

SMTP and HTTPS are used together in webmail applications.

Where:- They are used in the web browser on the client side and on the webmail server.

When:- HTTPS is used to secure the communication between the user's web browser and the webmail server. SMTP is used by the webmail server to send the email to the recipient's mail server.

The user's interaction with the webmail interface is secured by HTTPS, but the actual email transmission between mail servers still uses SMTP.

Ans: to the Qus: No: 05

The sender transmits the data segment and starts an RTO timer of 70ms. When the segment is lost, the receiver does not send an ACK. The sender's RTO timer expires after 70ms, prompting the sender to retransmit the segment. The receiver then successfully receives the retransmitted segment and sends an ACK to the sender.

Ans: to the Qus: NO: 06

IP address: 175.172.122.75

$$175 = 10101111$$

$$172 = 10101100$$

$$122 = 01111010$$

$$75 = 01001011$$

Binary IP = 10101111.10101100.01111010.01001011.

Subnet mask: 255.255.128.0

$$255 = 11111111$$

$$255 = 11111111$$

$$128 = 10000000$$

$$0 = 00000000$$

Binary Subnet Mask = 11111111.11111111.10000000.00000000

Bitwise AND result = 10101111.10101100.00000000.00000000.

Decimal conversion = 175.172.0.0

Binary Network Address = 10101111.10101100.00000000.00000000

Binary Broadcast Address = 10101111.10101100.11111111.11111111

Decimal conversion, 175.172.255.255.

Subnet Mask = 11111111.11111111.10000000.00000000

Number of 1's = $8 + 8 + 1 = 17$

Prefix mask: $\rightarrow /17$.

Ans: to the Qus: NO: 07

a)

Let N = number of objects.

Total RTT Time = $2 \times N \times RTT$

$\Rightarrow 480$

$= 2 \times N \times 30$

$\Rightarrow 480 = 60N$

$\therefore N = 8$.

(Ans)

b) Each objects size = 10MB = 80 Mbits .

Server speed = 80 Mbps .

$$\text{Transmission time per objects} = \frac{80 \text{ Mbits}}{80 \text{ Mbits/s}}$$

$$= 1 \text{ s}$$

$$= 1000 \text{ ms} .$$

per objects = 1s .

All 8 objects = 8s .

$$a) S_1 = 2024 + 350 = 2374$$

$$S_2 = 2374 + 127 = 2501$$

$$S_3 = 2501 + 412 = 2913$$

$$C_2 = 5044 + 250 = 5294$$

$$S_4 = 5294$$

So, the sequence number of the S_4 segment is 2913 and the acknowledgement number is 5294.

b) In the diagram, before retransmission, one of the server's segments is lost.

Assume S_2 is lost and S_3, S_4 arrive but are discarded as out of order.

Client has in-order data only up to S_1 . So it keeps expecting bytes 2374 and all ACKs it sends carry: —

$$\text{Ack}(\text{ACK}-2) = 2374.$$

$$c) S1 (2024 - 2373)$$

$$S2 (2374 - 2500)$$

$$S3 (2501 - 2912)$$

$$S4 (2913 - 3299)$$

Next expected server byte = 3300

So,

$$\text{Ack}(\text{ACK}-3) = 3300$$

With Go-Back-N, after the sender learns that S2 weren't received in order, it retransmits from S2 onwards: S2, then S3, then S4 again.