

CSE 421

Assignment-01

Spring 2024-B

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Sec : 22

Ans: to ques: no: 1

(a)

Source IP	destination IP	S. port	D. port	S. MAE	D. MAE
0	14	49154	80	@	D

(b)

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

Ans: to ques: no: 2

I can check the HTTP status code in the status-line field of the HTTP response. For example, 404 Not found, 500 internal server error, 403 forbidden, etc. A status code in the 4xx or 5xx range would indicate a client-side or server-side error.

~~The~~ For troubleshooting communication between the client & the web server, I can use the 'Head' HTTP method because it requests a response without the main response body which allows me to check the headers and status code without downloading the full content of the page.

Ans: to ques: no: 3

An iterative DNS Lookup can be faster than a recursive DNS lookup because in iterative, the client directly follows referrals and servers do minimal work.

In recursive DNS, client asks DNS server. DNS server then performs all steps of going to root servers, TLD and authoritative DNS servers while the client waits until it does all of that. So, the server does extra work and finish it's whole queries that takes a longer time.

On the other hand, in iterative DNS, client device contacts each DNS server step by step and each server gives the client a referral to the next server and then client immediately contact the next server without waiting for complex processing. So, no server does extra work for the client. Additionally, if the client has cached the addresses and use local caching, then the device likely holds root hints, cached Top-level domain servers, cached previous authoritative servers so it might skip many steps because it already knows certain DNS servers. Hence, bypassing to root, TLD, servers results into a faster response.

Ans: to ques: no: 4

SMTP and https are used together when we access web-based secure ~~web~~ mail services, like Gmail, outlook web, hotmail, yahoo mail etc.

SMTP is used by the webmail server to send the email to the recipient's mail server whereas https is used between ~~the~~ client's browser and webmail server to securely view, compose and submit the email.

So, actual email transmission is done between mail servers using SMTP and client interacts with <sup>secure</sup> web-based email server using https.

### Ans: to ques: no: 5

The sender transmits the data segment and starts an RTO timer of 70 ms. When the segment is lost, receiver doesn't send an Ack. The sender's RTO timer expires after 70 ms, prompting the sender to retransmit the segment.

This process repeats until it successfully receives the Ack from receiver end. And ~~there~~ the receiver successfully receives the retransmitted segment and sends an Ack to the sender.

In TCP, the error control also includes storing out-of-order segments until missing segments arrive and also detecting and discarding duplicated segments.

There are <sup>also</sup> different TCP sliding window protocols used in TCP like selective Repeat protocol and Go Back N ARQ. In Selective Repeat protocol, after 70 ms, only those segments are re-transmitted that were found lost or corrupted. Also, in Go Back N ARQ, all the segments are retransmitted from the lost segment to the last segment transmitted.

Ans: to ques: no. 6

IP address: 175.172.122.75 and subnet

mask: 255.255.128.0

Binary IP: 10101111.10101100.01111010.01001011

Subnet IP: 11111111.11111111.10000000.00000000

(AND) 10101111.10101100.00000000.00000000

↓  
∴ Network address = Decimal = 175.172.0.0/17 (Ans)

∴ Broadcast address = 175.172.127.255/17 (Ans)

∴ prefix mask = 8 + 8 + 1 = 17 = /17, (Ans)

Ans: to ques: no: 7

(a)

let,

$N$  = number of objects ; Non-persistent

$$\therefore \text{Total RTT time} = (N \times \text{RTT}) = N \times 2 \times (15 + 15) \\ = N \times 2 \times 30 = 60N$$

$$\therefore 60N = 480$$

$$\Rightarrow N = \frac{480}{60} = 8 = \text{total objects, (Ans)}$$

(b)

each object size = 10 MB ; total object = 8

Server speed = 80 Mbps

$\therefore$  80 Mb in 1 sec

$\therefore$  1 Mb  $\sim \frac{1}{80} \sim$

$$\therefore 8 \times 10 \times 8 \sim \sim \frac{8 \times 10 \times 8}{80} \text{ sec} = 8 \text{ sec}$$

$\therefore$  File transmission time for all objects = 8 sec

Ans: to ques: no: 8

(a)

Here, ~~Seq = 2024 + 2~~

After S4 segment,

$$Ack = 5044 + 250 = 5294$$

~~Seq = 2024~~

$$\begin{aligned} \text{Seq number} &= 2024 + 350 \\ &\quad + 127 + 412 \\ &= 2913 \end{aligned}$$

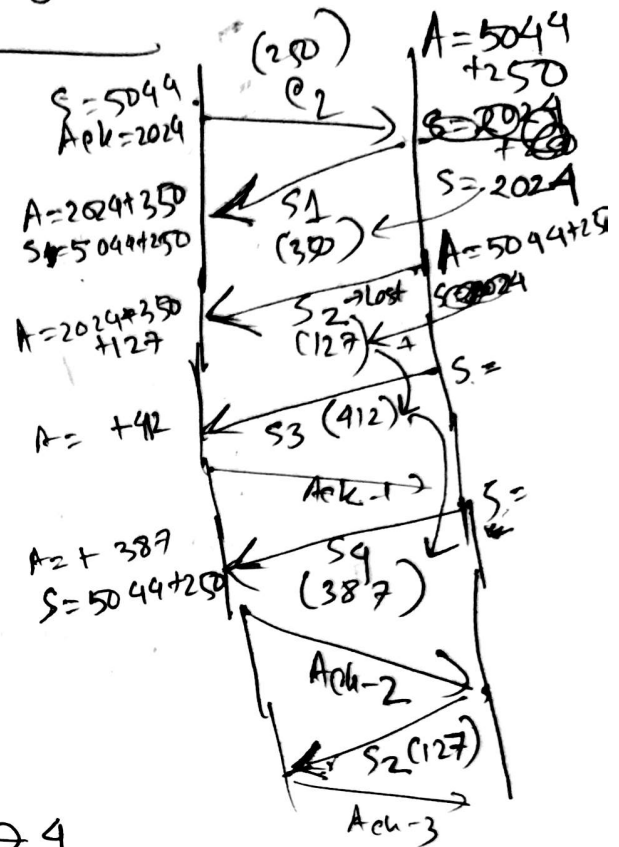
$$\therefore \text{Seq} = 2913 \quad \& \quad Ack = 5294$$

(b)

Ack number of Ack-2 segment

$$= 2024 + 350 + \cancel{127} + \cancel{412} + \cancel{387}$$

= 2374 ; because as S2 is lost segment client keep on expecting 2374.



(c)

In Go-Back-N sliding window, Ack-3 segment

$$\text{Ack} = 2024 + 350 + 127$$

$$= 2501, (\text{Ans})$$

As it won't take  $S_3, S_4$  segment until correct ordered  $S_2$  is not achieved.