Assignment-1

Name: Amio Malakar Ankon
ID: 21201669 ; Course-CSE421
section: 22

Question: ~~Fall 2024-B~~
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Answer to the question No. 1

(a) Source IP: 0

Destination IP: 14

Source MAC: C

Destination MAC: D

Source Port: 50000

Destination Port: 80

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

Answer to the question No. 2

For deducing the problem, the status code in the first line of HTTP Response lets know about server/client side issues such as

404 Not Found, 500 internal server error, 504 Gateway Timeout which tell things as page not existing, server crashing, server not responsing etc.

For troubleshooting communication between the client & and web server, Head method can be used which helps to check if server can be reached, without downloading content.

Answer to the question No.3

In iterative DNS lookup, client communicates directly with each of the DNS server and caches intermediate responses locally. On the other hand, in recursive lookup, one sever performs all queries for the client which increases latency and server load. So, this way ~~int~~ iterative DNS lookup can be potentially faster.

Answer to the question No. 4

In case of webmail service, SMTP and HTTPS are used together. In case of using webmail applications, users access the mail interface with HTTPS. Then, after the mail is composed and ready to be sent, the web server uses SMTP to deliver it to the receiving mail server. This is how SMTP and HTTPS are used together to secure connection and message delivery.

Answer to the question No. 5

Here, RTO timer was set to 70 ms and the data segment was lost. So, to address the ~~log~~ lost segment the steps taken will be as such -

(i) After transmitting the data RTO timer is started.

(ii) As data is lost, no ACK comes back and RTO expires.

(iii) As RTO expires, the data is sent again

(iv) when ~~ee~~ receiver finally gets the segment it sends ACK back with sequence number.

(v) Then sender step by step repeats the process by reselting the timer with each segment sent.

Answer to the question No. 6

Given, IP Address = 175.172.122.75

subnet mask = 255.255.128.0

now, 255.255.128.0

= 11111111.11111111.10000000.00000000

17 total 1's so prefix mask = 17

also, 175.172.122.75

= 10101111.10101100.01111010.~~01001011~~
01001011

now,

```
10101111.10101100.01111010.01001011
11111111.11111111.10000000.00000000
-----------------------------------
AND→ 10101111.10101100.00000000.00000000
   = 175.172.0.0
```

∴ Network Address = 175.172.0.0/17

also, if we NOT the subnet mask

we get = 00000000.00000000.01111111.11111111

now,

```
10101111.10101100.01111010.01001011
00000000.00000000.01111111.11111111
-----------------------------------
OR→ 10101111.10101100.01111111.11111111
  = 175.172.127.255
```

∴ Broadcast address = 175.172.127.255/17.

Answer to the question No. 7

(a)

lets take total objects = n

now, RTT = $15 \times 2 = 30$ ms

∵ each object costs 2 RTTs = 2×30 ms = 60 ms

so, total RTT = 60 ms $\times n$

given, total RTT = 480 ms

$\therefore$ 480 ms = 60 ms $\times n$

$\Rightarrow n = 8$.

$\therefore$ 8 objects.

(b) total object = 8

each object size = 10 MB = 10×8 Mb = 80 Mb

$\therefore$ total " = 80×8 Mb

= 640 Mb

given, speed = 80 Mbps

$\therefore$ file transmission time = $\frac{640 \text{ Mb}}{80 \text{ Mbps}}$

= 8 sec

Answer to the question No. 8

(a) Given. $C_1 = 192B$

$C_2 = 250B$

$S_1 = 350B$

$S_2 = 127B$

$S_3 = 912B$

$S_4 = 387B$

C_2 sequence Number = 5044

C_2 acknowledgement Number = 2024

now, C_2 ack = 2024

$\therefore$ S_1 first byte position = 2024

$\therefore$ S_1 ranges from 2024 to (2024 + 350 - 1)
= 2373

$\therefore$ S_2 " " 2373 + 1 = 2374 to (2374 + 127 - 1)
= 2500

$\therefore$ S_3 " " 2500 + 1 = 2501 to (2501 + 412 - 1)
= 2912.

$\therefore$ S_4 ~~segment~~ sequence number = 2912 + 1 = 2913.

now, C_2 last byte = 5044 + 250 - 1

= 5293

∴ S_4 acknowledgement = 5293 + 1

= 5294

(b) Here, ACK-2 is sent after S1.

now, S_1 begins from 2024 to (2024 + 350 - 1)

= 2373

∴ ACK-2 = 2373 + 1 = 2374

(c) If Go-Back-N sliding window protocol is used.

Here, Ack-3 is sent after S2

from b, S_2 starts from 2374 to 2500.

∴ Ack-3 = 2500 + 1 = 2501.