Name: Ishrakul Tahmid

ID: 21-45402-3

Sec: H

1

Ans:

Source port = 16 bits

Destination port = 16 bits

Sequence Number = 32 bits

Acknowledgement Number = 32 bits

Data offset = 4 bits

Flags = 6 bits

Window size = 16 bits

Total bit used = (16 + 16 + 32 + 32 + 4 + 6 + 16) bits

= 122 bits

Ans.

TCP header is 20 bytes

= (20 X 8) bits

= 160 bits

Remaining bits for other fields = (160 - 122) bits

= 38 bits Ans

2

ID = 21 - 45 40 2 - 3
A B C D E F G H

E = 4

F = 0 ; Let, F = 7

G = 2

Initial sequence number = F * 1000
= 7 X 1000
= 7000

Packet1 data size = (G X 100) bytes
= 2 X 100 bytes
= 200 bytes

Packet2 data size = (F X 100) bytes
= 7 X 100 bytes
= 700 bytes

Packet3 data size = (E X 100) bytes
= 4 X 100 bytes
= 400 bytes

We know, the sequence number for each segment is the number of the first byte carried in that segment.

So,

Sequence number for packet 1 = 7000 ✓.

Sequence number for packet 2 = 7000 + 200 = 7200 ✓.

Sequence number for packet 3 = 7200 + 700 = 7900 ✓.

Next packet sequence number = 7900 + 400

= 8300 ✓.

3

IP: 21 - 45402 - 3

A B C D E F G H

G = 2

Total IP packet size = (G x 1000) bytes

= 2000 bytes ✓.

IP header size = 20 bytes

TCP header size = 20 bytes

TCP payload size =

Total IP packet size − IP header size − TCP header size

= (2000 − 20 − 20) bytes

= 1960 bytes ✓.

If TCP header size = 40 bytes

New TCP payload size = (2000 - 20 - 40) bytes

= 1940 bytes

Payload change = (1960 - 1940) bytes

= 20 bytes

4

ID: 21 - 45 402 - 3

A B C D E F Gr H

E = 4

F = 0 ; Let f = 7

Gr = 2

TCP payload size = EFGr x 10

= (4 x 7 x 2) x 10

= 560 bytes

Total TCP segment size =

TCP header size + TCP payload size

= (20 + 560) bytes = 580 bytes

$$\text{Header percentage} = \left(\frac{\text{Total header size}}{\text{Total TCP segment size}}\right) \times 100$$

$$= \left(\frac{20}{580}\right) \times 100$$

$$= 3.451\%$$

5

TCP header size = 50 bytes

Data offset field value = 0100 (binary)

= 4 (decimal)

Data offset field specifies the size of the TCP header in 32-bit words (4 bytes) [1 word = 4 bytes]

Header size = 4 x 4 bytes

= 16 bytes

So, according to data offset fields TCP header is 16 bytes.

Since the TCP header size must be at least as large as indicated by the the data offset field, this situation is impossible.

Actual Header size (50 bytes) ≠ calculated Header size (16 bytes)