

CS & IT ENGINEERING

Computer Networks



TCP & UDP

DPP- 02 (Discussion Notes)



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TOPICS TO BE COVERED

01 Question

02 Discussion

Q.1

Given the bandwidth of a network is 512MB/sec. Calculate the wrap around time? (in sec upto 2 decimal places) [NAT]

P
W

$$8.36 - 8.39$$

$$BW = 512 \text{ MB/sec}$$

$$1 \text{ sec} = 512 \times 10^6 \text{ bytes}$$

$$\text{total sequence bytes} = 2^{32} \text{ bytes}$$

$$\begin{aligned}\text{Wrap around time} &= \frac{2^{32} \text{ bytes}}{512 \times 10^6 \text{ bytes}} \\ &= \boxed{8.38860}\end{aligned}$$

Q.2

Which of the following statements is true regarding wrap around time in transport layer protocol?

P
W

[MCQ]

A.

It's a time to use upto 2^{32} ports number.

B.

It's a time to use upto 2^{32} sequence number.

C.

It's a time to use upto 2^{32} bits of data.

D.

None of the above.

Q.3

P
W

Consider a long - lived TCP session with an end to end bandwidth of 1.5 GB/sec. The session start with a sequence number 8328. The minimum time before this sequence number can be used again is R3 second. (Rounded to the closest integer.) [NAT]

$$\begin{aligned} Blw &= 1.5 \text{ GB/sec} \\ &= 1.5 \times 10^9 \text{ Bytes/sec} \\ 1 \text{ sec} &= 1.5 \times 10^9 \text{ bytes} \\ \text{Wrap around time} &= \frac{2^{32} \text{ bytes}}{1.5 \times 10^9 \text{ bytes}} \\ &= \underline{22.906492} \end{aligned}$$

Q.4

Which of the following conditions are true to avoid wrap around time? (B = Bandwidth) [MSQ]

A.

Minimum sequence number required to avoid wrap around with in the lifetime = $2 \times \text{lifetime} \times B$

B.

Minimum sequence number required to avoid wrap around with in the lifetime = $\text{lifetime} \times B$

C.

Minimum number of bits required in the sequence number field to avoid wrap around with in lifetime = $\lceil \log_2(\text{lifetime}) \times B \rceil$

D.

None of the above.

$$B = 1 \text{ Gbps} \quad Lt = 180 \text{ sec}$$

$$1 \text{ sec} \stackrel{\text{↑}}{=} 10^9 \text{ Bytes}$$

$$\begin{aligned} 180 \text{ sec} &= 10^9 \text{ bytes} \times 180 \\ &\stackrel{B \times LT}{=} LT \times B \end{aligned}$$

Q.5

Consider 400 Mbps network with a sequence number field 30 bits. The wrap around time of the sequence number is _____. [NAT]

P
W

$$\cancel{2^{32}} \quad 2^{30}$$
$$\text{Wrap around time} = \frac{2^{30} \text{ bytes}}{400 \times 10^6}$$
$$= \underline{\underline{21.47 \text{ sec.}}}$$

