

Q1 TCP Sequence Numbers

A TCP sender is just about to send a segment of size 100 bytes with sequence number 1234 and ack number 436 in the TCP header. What is the highest sequence number up to (and including) which this sender has received all bytes from the receiver?

Answer = 1334

ACK = 436

SEQ = 1234

DATA = 100

SEQ + DATA = 1334

Q2 TCP Sequence Numbers

A TCP sender is just about to send a segment of size 100 bytes with sequence number 1234 and ack number 436 in the TCP header. Is it possible that the receiver has received byte number 1335?

Answer : No

Q3 TCP Timeout

A TCP sender maintains a SmoothedRTT of 100ms. Suppose the next SampleRTT is 108ms. Which of the following is true of the sender?

3. Whether it increases SmoothedRTT depends on the deviation.

Q4 TCP timeout

A TCP sender maintains a SmoothedRTT of 100ms and DevRTT of 8ms. Suppose the next SampleRTT is 108ms. What is the new value of the timeout in milliseconds? (Numerical question)

Timeout = estimatedRTT + 4(devrtt)

~~$t = 100 + 4(8)$~~

~~$t = 108 + 43$~~

~~$t = 140$~~

~~140 ms is the answer assuming samplertt is the estimated. If smoothed is the estimate then the answer is~~

Smoothed is estimatedRTT

Timeout = 100 + 4(8)

Answer: Timeout = 132 ms.

Q5 Which is the purpose of the receive window field in a TCP header?

Answer = Flow control

Q6 Roughly how much time does it take for both the TCP sender and receiver to establish connection state since the connect() call?

Answer = $1.5RTT$ as it must go through handshake

Q7 TCP uses cumulative ACKs like Go-back-N, but does not retransmit the entire window of outstanding packets upon a timeout. What mechanism lets TCP get away with this?

Answer = Sequence and ACK numbers

Q8 A sender that underestimates the round-trip time of a connection may unnecessarily induce a TCP timeout

Answer = true

Q9 Which of the following services use TCP?

Answer = HTTP and FTP use TCP

Q10 Ben Bitdiddle's home network connection can upload at 125,000 bytes/second. His router has a 100,000 byte first in first out buffer for packets awaiting transmission. If the buffer is completely full, how long will it take for the buffer to clear?

Answer = 0.8 seconds

Q11 Ben Bitdiddle's home network connection can upload at 125,000 bytes/second. His router has a 100,000 byte first in first out buffer for packets awaiting transmission. At time 0, Ben's client starts sending 1,000 byte packets at 150 packets/s. When will the first packet be dropped by the router?

Answer = 4 seconds

Q 12 Alyssa P. Hacker and Ben Bitdiddle communicate over a link with capacity of 100 pkts / sec. The RTT on this link is 100 ms. If a sliding window protocol with acknowledgement packets is used, and there is a fixed window size of 4 packets, what is the maximum rate of traffic on the link?

Answer = 40 packets