Q1) Consider the two 16-bit words (shown in binary) below. Compute the Internet checksum value for these two 16-bit words:

11011011 10010011
01111110 01000110

Answer:

11011011 10010011

+01111110 01000110

101011001 11011001

Carry

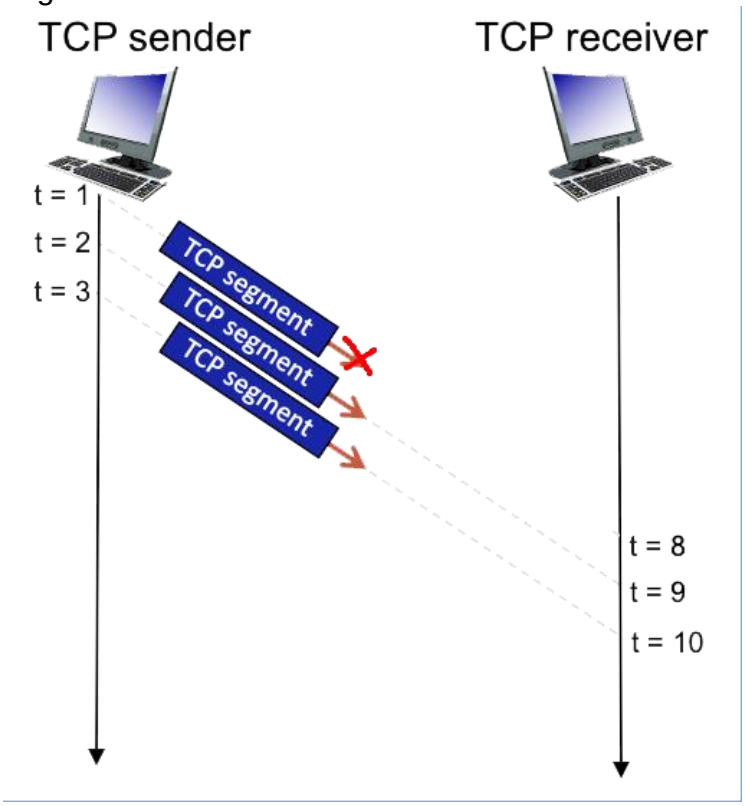
=01011001 11011010 (SUM)

The internet checksum (one's complement of the sum):

=10100110 00100101 (Answer: Internet checksum)

Q2) Consider the figure below (simplex communication secenario). The TCP sender sends an initial window of 3 segments. Suppose the initial value of the sender->receiver sequence number is 397 and the first 3 segments *each* contain 730 bytes. As shown in the figure below, 1 of the 3 segment(s) are lost between the segment and receiver.

What is the SEQ number from the Sender and ACK Number from the receiver for each segment?



Answer:

1. sequence numbers are: SEQ1=397, SEQ2=1127(397+730), SEQ3 =1857 (1127+730)

2. The receiver's ACKs are: ACK1 = N/A (lost), ACK2 = 397, ACK3 = 397. Because the first segment is lost, the receiver is going to ask for that segment and will not acknowledge the 2nd and 3rd segment. Because by through acknowledge number, the receiver is informing the

sender that it has received all the bytes before that. Therefore, the receiver cannot acknowledge 2nd and 3rd segment.

*Q3) Suppose that TCP's current estimated values for the round-trip time (*estimatedRTT*) and deviation in the RTT (*DevRTT*) are 300 msec and 35 msec, respectively. Suppose that the next three measured values of the RTT are 250 msec, 200 msec, and 330 msec respectively.*

Compute TCP's new value of DevRTT, estimatedRTT, *and the TCP timeout value after each of these three measured RTT values is obtained. Use the values of α = 0.125, and β = 0.25.*

Note: All in msec

Answer:

estimatedRTT = (1-alpha) *estimatedRTT + alpha*sampleRTT

DevRTT = (1-beta) *DevRTT + beta * |estimatedRTT - sampleRTT|

TCP timeout = estimatedRTT + (4*DevRTT)

For RTT1
The estimatedRTT(1) = 293.75

The DevRTT (1) = 37.19

The timeout (1) =442.5

For RRT2

The estimatedRTT (2) = 282.03

The DevRTT (2) = 48.4

The timeout (2) = 475.62

For RTT3

The estimatedRTT (3) = 288.03

The DevRTT(3) = 46.79

The timeout (3) =475.2