TCP/IP Networking 2017 Test 3

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Grading:
For each question, exactly one of the four proposed answers is correct. If the good answer and only the good answer box is crossed $\Rightarrow$ +1 point. If one bad answer box is crossed and no other box is crossed $\Rightarrow -\frac{1}{3} = -0.333$ point. If 0 or more than 1 answer box is crossed $\Rightarrow$ +0 point.
$\longleftarrow$ Please encode your SCIPER number here and write your full name in the box below. $\downarrow$

Name, First Name:

....

Question 1 A sends data to B over a dedicated channel of capacity c, using a sliding window protocol with window size W. The round trip time is RTT. There is no packet loss, there is no interfering traffic, ACKs are sent on a separate channel of infinite capacity and we ignore overhead due to packet headers. The sending rate achieved by A is:

☐ $\min\left(c, \frac{RTT}{W}\right)$

☐ $c + \frac{W}{RTT}$

☐ $\min\left(c, 1.33\frac{W}{RTT}\right)$

☐ $\min\left(c, \frac{W}{RTT}\right)$

Question 2 A and B use TCP. The maximum segment size is 1'000 bytes. At time t_1, which bytes may A send ?

☐ 301:501

☐ None of these.

☐ 301:1301

☐ 301:401
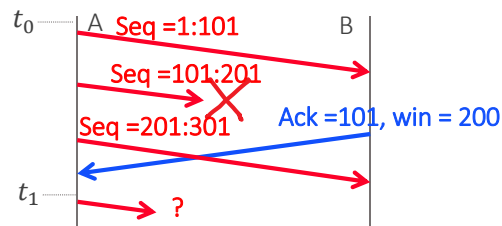
Question 3   A streaming application sends one short IP packet every 10 msec, using either UDP or TCP. When one packet is lost, can head-of-the line blocking occur ?

☐ Yes with TCP, no with UDP.

☐ With both.

☐ Yes with UDP, no with TCP.

☐ No.

Question 4   Say what is true.

1. UDP is the same with IPv4 and with IPv6.
2. TCP is the same with IPv4 and with IPv6.

☐ None   ☐ 1 and not 2.   ☐ 2 and not 1.   ☐ Both.

Question 5   Say what is true.

1. A TCP server can have multiple connections using the same socket for data transfer, as long as the local port is the same for all connections.
2. A TCP server uses a different socket for connection establishment and for data transfer.

☐ 2 and not 1.　　☐ Both.　　☐ None　　☐ 1 and not 2.

Question 6   Lisa sends a mySQL query to a TCP server that has syn-cookies activated. mySQL is an application such that, after a `connect()`, the client's next socket call is `receive()` and not `send()`. The connection finalizing ACK sent by Lisa's device is lost. Say what happens next:

1. The TCP server sends no information to Lisa and Lisa's device waits forever or until a timeout occurs.
2. The TCP server retransmits the SYN-ACK using one of its implemented loss detection mechanisms, in order to trigger Alice's device to retransmit the lost ACK.

☐ Both.　　☐ 1 and not 2.　　☐ 2 and not 1.　　☐ None

Question 7   A UDP server application receives multiple messages over one single non-connected UDP socket and receives no other traffic from the network. We do a packet capture at this server of all UDP traffic that is received by this application. Say what is true.

1. The source UDP port is the same in all packets.
2. The destination UDP port is the same in all packets.

☐ 1 and not 2.　　☐ 2 and not 1.　　☐ None　　☐ Both.

Question 8   A version of TCP implements loss detection by timeout and fast retransmit, and no other loss detection mechanism. The last packet of a data transfer is lost. By which mechanism can the loss be detected ?

☐ By fast retransmit only.　　　　☐ Either by timeout or by fast retransmit, depending on the case.

☐ By timeout only.　　　　☐ This loss will not be detected.

Question 9   Application A on one host sends data to application B on some other host using TCP. TCP at A sends 5 segments of 100 bytes each; the second segment is lost and not yet re-transnmitted, the other segments are received by TCP at B. How many bytes can B read from the socket ?

☐ 100.　　　　☐ 400.　　　　☐ 0.　　　　☐ 200.
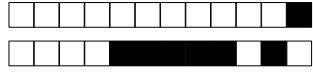
Question 10   The goal of flow control in TCP is to:

1. prevent sources from congesting network buffers,
2. prevent the source from congesting the receiver's buffer.

☐ 1 and not 2.   ☐ 2 and not 1.   ☐ None   ☐ Both.