

Review Questions 13

Your Name:

Please print out this form (two-sided, if you can) and write your answers *legibly* in the spaces provided. If you can't write legibly, type.

1. Consider a TCP session in which the sender attempts to write a buffer with 10 MB of data, but the receiving application receives data by repeatedly invoking the method `socket.recv(1)`, with a 1 second delay between each successive call to `recv`. How many bytes are carried in the TCP packets from the sender? Assume that the MSS is 1,000 bytes and that the receive buffer has space for 1 MB.
2. Assume that a TCP sender A is connected to router X by a 100 Mb/s link, that the corresponding receiver B is connected to router Y by a 100 Mb/s link and that the link connecting X and Y is 10 Mb/s. Also, assume that the RTT for the connection from A to B is 50 ms, that the MSS is 1250 bytes and that `ssthresh=100 KB`. Suppose that A starts in the slow-start state. At what rate is A sending after 400 ms passes?

3. Consider the same setup as the last problem. Suppose that at time t , A is in additive increase mode and that it detects a packet loss, causing it to cut its sending rate from 12 Mb/s to 6 Mb/s. If the buffer at router X can store 50 KB worth of data, how long does it take for the buffer at X to drain, assuming that A does not increase its rate any further.