

COMP2190 – Semester 1 2020/2021

Tutorial 4

Problems

1. Suppose that TCP's current estimated values for the round trip time (estimatedRTT) and deviation in the RTT (DevRTT) are 310 msec and 37 msec, respectively. Suppose that the next three measured values of the RTT are 320, 360, and 330 respectively. Compute TCP's new value of estimatedRTT, DevRTT, and the TCP timeout value after each of these three measured RTT values is obtained. Use the values of $\alpha = 0.125$ and $\beta = 0.25$.
2. Host A and B are directly connected with a 100 Mbps link. There is one TCP connection between the two hosts, and Host A is sending to Host B an enormous file over this connection. Host A can send its application data into its socket at a rate as high as 120 Mbps, but Host B can read out of its buffer at a maximum rate of 50 Mbps. Describe the effect of TCP flow control.
3. Host A and B are communicating over a TCP connection. Host B allocates a buffer of 4096 bytes. Host A sends two 2 KB segments back-to-back. Suppose that the segments are not immediately read out of the receive buffer. In the acknowledgment of the second arriving segment which receive window size does Host B advertise to Host A? At this point can Host A send more data to Host B? If not, how will Host A be allowed to transmit additional data to Host B?
4. The sequence number field in the TCP header is 32 bits long, which is big enough to cover 4 billion bytes of data. Even if this many bytes were never transferred over a single connection, why might the sequence number still wrap from $2^{32} - 1$ to 0?
5. If host A receives two SYN packets from the same port from remote host B, the second may be either a retransmission of the original, or if B has crashed and rebooted, an entirely new connection request. Describe the difference as seen by host A between these two cases.

Acknowledgment

Questions 1 and 2 are from "Computer Networking: A Top-Down Approach," 7/E by J. F. Kurose and K. W. Ross. Questions 4 and 5 are from "Computer Networks: A Systems Approach" 5/E by L. L. Peterson and B. S. Davie.