

18-345
Introduction to Telecommunication Networks
Homework 5 Solutions

November 12, 2008

Due: November 19, 2008

1. What is the fastest line speed at which a host can send out 1500-byte TCP payloads with 120-sec maximum packet lifetime without having the sequence numbers wrap around? You need to add the TCP, IP & Ethernet overhead (header size) while calculating the packet size which is transferred over the wire. Assume that Ethernet frames may be sent continuously.

2. Hosts A and B transfer data according to the three phases of TCP connection. Fill in the sequence numbers and the ACK numbers of the following packet sequence, which shows the start of the TCP connection, so that the numbering is consistent.

A -> B: SYN, Seq_no = 125

B -> A: SYN, ISN Seq_no = _____,
ACK, Ack_no = ____

A-> B: Seq_no = ____
ACK, Ack_no = 4001

3. Why does UDP exist? Would it not be enough to let user processes send raw IP packets?

4. 'Traceroute' is a Linux utility to find route from local host to a remote host. Refer to lecture 20 notes for details. The Windows equivalent of traceroute is 'tracert'. Use 'traceroute'/'tracert' to find the route to www.ox.ac.uk and www.mit.edu. Observe the routers found along the path to both these locations. At what point do the routes diverge? Why does this happen?

5. Explain why multiplicative decrease and additive increase is used in congestion control mechanisms?