**Homework 6: TCP Reliability**

In the exercises below, assume the following:

* link MTU is 1500 bytes.
* IP overhead is 20 bytes
* TCP overhead is 32 bytes
* ACKs may be delayed for a short while and then sent (called a delayed ack), but once 2 in-order segments arrive, a cumulative ACK for both is sent immediately.
* Assume an initial window size of 4 TCP segments. (Ignore subsequent changes to window size due to flow control and congestion control considerations for the purpose of this exercise.)

Exercise 1 : Suppose a TCP client sends an application request to a TCP server with a data length of 429 bytes. Suppose the server responds with application data of length 7643 bytes. Draw a time sequence diagram showing the TCP handshake and data/ack messages with seq numbers, ack numbers and packet length identified for each message.

Seq 0 request from 10.0.1.2 to 128.119.245.12

Seq 0 Ack 1 from 128.119.245.12 to 10.0.1.2

Seq 1 ACK 1 from 10.0.1.2 to 128.119.245.12

*<* ***Note:*** *Solution to above can be found in accompanying wireshark trace:* *TCP-Wireshark-Trace-HW6.pcapng. To analyze the above packet trace for this homework, temporarily disable HTTP processing in wireshark by going to* ***Analyze > Enabled Protocols*** *and unchecking all HTTP items.* Ignore any TCP messages marked [TCP Window Update].>

Exercise 2: Suppose a TCP client sends an application request to a TCP server with a data length of 376 bytes. Suppose the server responds with application data of length 6101 bytes. Draw a time sequence diagram showing the TCP handshake and data/ack messages with seq numbers, ack numbers and packet length identified for each message.