The University of Queensland
School of Information Technology and Electrical Engineering

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COMS3200/7201 – Tutorial 3

Questions

1. Why does UDP exist? Would it not have been enough to just let user processes send raw IP packets?
2. (PD 5.5) When closing a TCP connection, why is the two-segment-lifetime timeout not necessary on the transition from LAST_ACK to CLOSED?
3. (variant of PD5.9) You are hired to design a reliable byte-stream protocol that uses a sliding window (like TCP). This protocol will run over a 100Mbps network. The round-trip-time (RTT) of the network is 100ms, and the maximum segment lifetime (MSL) is 60 seconds.
   (a) How many bits would you include in the AdvertisedWindow and SequenceNumber fields of your protocol header?
   (b) How would you determine the MSL and RTT given above and how certain could you be of those values?
4. (variant of PD5.12) If host A receives two SYN packets from the same port from remote host B, how do you determine whether the second is a retransmission or an entirely new connection request?
5. *Initial* TCP sequence numbers specified during connection are often generated according to a 32 bit clock incremented every 4 microseconds. How often do these sequence numbers wrap around?
6. TCP Maximum segment lifetime (MSL) – the maximum time a segment exists out on the network is taken to be 120 seconds. When starting or recovering from a crash, TCP entities must wait 120 seconds before sending any segments. Why? How might this restriction be overcome?