COMP 375 (Computer Networks): Quiz #6
Friday, April 6, 2018

Name: _____**SOLUTIONS**_____

1. Which simpler in TCP: flow control or congestion control? Briefly explain why.

    Flow control is easier because the receiver explicitly tells the user how much data it can handle. With congestion control, we often have to guess the network capacity based on congestion events that we observe.

2. Assume we are in the *congestion avoidance* state of **TCP Reno** congestion control. For each of the following congestion events, indicate which state we would enter (again, from congestion avoidance) and briefly explain why we enter that state for that type of event.

    Timeout:

    Enter the SLOW START state. A timeout indicates no packets are getting through the network (not just once or two getting dropped). This means there is probably serious congestion so we'll reset our congestion window to 1 and quickly try to ramp back up (exponential increase in SLOW START).

    Duplicate ACKs:

    Enter the FAST RECOVERY state. Duplicate ACKS imply only mild congestion, as some segments are getting through (hence are able to trigger duplicate ACKs). We can be less aggressive about cutting back our congestion window, but will want to be modest about increasing so we don't cause more congestion. The linear increase of FAST RECOVERY is a good match for this.

3. For each of the following criteria, indicate whether circuit switching or packet switching networks perform better for that criterion and briefly explain why.

    Reliability:

    Packet switching. There is only one path taken by a connection in circuit switching so if one part of the path goes down, we cannot recover. Packet switching allows traffic to avoid broken/slow links.

    Link Utilization:

    Packet switching. In circuit switching, only one connection may use a link. If that connection isn't sending anything, that link is wasted. In packet switching, links may be multiplexed (i.e. shared among several connections).