Homework 4. April 27, 2021

1. A datagram subnet allows routers to drop packets whenever they need to. The probability of a router discarding a packet is *p*. Consider the case of a source host connected to the source router, which is connected to the destination router, and then to the destination host. If either of the routers discards a packet, the source host eventually times out and tries again. If both host-router and router-router lines are counted as hops, what is the mean number of

   (a) hops a packet makes per transmission?

   (b) transmissions a packet makes?

   (c) hops required per received packet?

2. Describe two major differences between the ECN method and the RED method of a congestion avoidance.
3. Imagine a flow specification that has a maximum packet size of 1000 bytes, a token bucket rate of 10 million bytes/sec, a token bucket size of 1 million bytes, and a maximum transmission rate of 50 million bytes/sec. How long can a burst at maximum speed last?
4. A router can process 2 million packets/sec. The load offered to it is 1.5 million packets/sec. If a route from source to destination contains 10 routers, how much time is spent being queued and serviced by the CPUs?
5. Consider the user of differentiated services with expedited forwarding. Is there a guarantee that expedited packets experience a shorter delay than regular packets? Why or why not?