EECSE 461
Homework 5
Winter 1997
Prof. Tom Anderson
Due: Friday, March 6, 3:30pm

All questions are equally weighted so make sure you get the easy ones right. You are free to discuss this assignment with other students and the TA, but you must each individually write up and submit your own solutions.

1. Peterson and Davie, Ch. 8, Problem 3

2. Peterson and Davie, Ch. 8, Problem 5. You should assume that the link is duplex, with bandwidth is equal to 10 packets per round trip time.

3. Peterson and Davie, Ch. 8, Problem 6

4. Peterson and Davie, Ch. 8, Problem 8

5. Peterson and Davie, Ch. 8, Problem 17

6. Peterson and Davie, Ch. 5, Problem 19

7. Recall that in source routing, the sending host lists each hop of the path explicitly in the packet header. Suppose we want to extend unicast source routing to multicast. Sketch out the design of a scheme for doing so. How could you efficiently encode the route of a multicast packet in the packet's header? Write down the format of packet headers you would define to implement your scheme. Do you think it would be easy to engineer and deploy such an approach in real networks?

8. One difficulty in the deployment of the MBone has been incompatibilities between variants of multicast routing protocols. Suppose we want to bridge together two multicast networks, network N1 running protocol P1 and network N2 running protocol P2. Assume there is a sender S in N1 and a receiver R in N2 and that the two networks are interconnected via two gateways G1 and G2 (i.e., there are two possible paths from N1 to N2 and vice versa). Suppose further that P2 computes the reverse-path route from R to S via G1 but P1 computes the distribution tree from S to N2 via G2. As a result, packets will not be correctly routed from S to R. Explain how this happens. What might you do to avoid this problem?

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