

Homework # 3

Due November 20

Problem 1: 5 points

You have two LANs. You connect them with *two* bridges that learn but do not form spanning trees. What happens to the packets? Will this setup work at all?

Problem 2: 5 points

Is the following statement true? “The spanning tree algorithm for bridges runs a shortest path algorithm so that any two nodes will be connected by the shortest path.”

Explain your answer.

Problem 3: 10 points

Suppose two applications use TCP to send data but only send one character per segment. Estimate the maximum percent of the network bandwidth they will have for their data. [Problem 12.8, Comer p. 151]

Problem 4: 10 points

Klutz Networking has released a new gateway that runs RIP. However, due to some programming error, the RIP routing messages produced by this network announce all networks that are at a distance of 7 hops or greater as being at distance 7. What sort of problems can occur when the Klutz gateways are used?

Problem 5: 15 points

I logged into `speedy.mcnc.org` this morning and printed out its routing table using the Unix command “`netstat -n -r`”. The result (with the `Refcnt` and `Use` columns omitted) was the following:

```

Routing tables
Destination      Gateway          Flags Interface
127.0.0.1        127.0.0.1       UH    lo0
128.109.130.14   127.0.0.1       UH    lo0
default          128.109.130.54  UG    qe0
128.109.130      128.109.130.14  U     qe0
128.109.133      128.109.130.12  UG    qe0
128.109.134      128.109.134.1   U     qe1
128.109.239      128.109.134.1   U     qe1

```

Draw `speedy` along with its immediate networks and their gateways. Through which gateways does a packet from `speedy` to the machines with IP numbers 128.109.130.4, 128.109.133.3, 128.109.137.159, and 130.127.8.1 pass.

Hint: You probably ought to read the manual page for `netstat` before attempting to answer this question.

Problem 6: 5 points

It is sometimes claimed that a 4 megabit per second token ring is faster than a 10 megabit per second Ethernet. Can this possibly be true?