Homework # 1

Due October 3

In general the points allocated to a homework will be a roughly equal to the number of minutes a question should require to answer. Most of those tens of minutes should be allocated to thinking and not to writing. *Please* avoid long answers.

Problem 1: 15 points

At a propagation speed of $200\frac{m}{\mu sec}$, derive the minimum packet length for an ethernet 2500 m long (2800 m long when transceiver cable is included) operating at 10 Mbps. Does your result equal that specified by the standard? Why not? If a repeater between two segments introduces a $\frac{1}{2}\mu sec$ delay, how much is the maximum length of the ethernet reduced?

Problem 2: 5 points

What is the network and host parts of each of the following Internet addresses (assume there are no subnets): (a) 128.109.138.119, (b) 192.12.65.45, (c) 129.106.4.1, and (d) 18.58.0.3.

Problem 3: 10 points

ARP is often cited as a security weakness. Explain why. (Comer, Exercise 5.7)

Problem 4: 5 points

When the machine with Ethernet address 8:0:20:0:b:d0 boots, what packet (give the bytes in hexadecimal) does it place on the Ethernet when it RARPs to find its IP address.

Problem 5: 10 points

What problems might arise if untrustworthy programmers were allowed to "forge" source addresses on packets written on an Ethernet joined by a single transparent bridge to another Ethernet?

Problem 6: 10 points

Suppose all the bridges on the bridged Ethernet illustrated in Figure 1 on the next page are magically started simultaneously (*i.e.,* all bridges "think" they are root). What is the state of the system after bridge B2 places a bridge protocol data unit on LAN 3?

Eventually what spanning tree will be generated by the IEEE 802.1 algorithm.

Problem 7: 5 points

What is the spanning tree and distance from root of each LAN in the remotely bridged Ethernet of Figure 2 on the next page?