

Written Homework

1. The network layer controls the routing of packets between two hosts. It does not guarantee that packets will arrive at the destination host in the same order they were sent by the source host. Since the data link layer guarantees that frames will be passed to the network layer in the order they were sent, why doesn't the network layer necessarily receive packets in the order they were sent?
2. This question refers to a link-state routing algorithm where you are router A. In the first 60 seconds after being booted you receive the following delay updates (including two generated by yourself).

A B1 C3
B A2 D1 E5
C A3 E4
D B3 E3 F2
E B3 C4 D3 F2
F D7 E4

The first character on the line gives the source of the update. The remaining items give the perceived delay from the named source to the given directly-connected router. For example, the first line above means that router A has a line to B with delay 1 and a line to C with delay 3.

Draw the network described by the above set of updates. Note the delay does not have to be symmetric for a link so you should use arrows for each link to indicate the direction of the delay. What is your (router A's) source tree for sending from A to all other nodes? What is your (router A's) sink tree for sending to A from all other nodes?

3. Looking at the subnet of Fig. 5-6 in the 4th ed. of the text, how many packets are generated by a broadcast from B, using
 - (a) reverse path forwarding?
 - (b) the sink tree?
4. Should ARP update the cache if an old entry already exists for a given IP address? Why or why not?
5. Consider the following scenario on a local area network. All frames destined for machine A carry IP datagrams that have destination equal to A's IP address, while frames destined for machine B carry IP datagrams with destination *not* equal to B's IP address. Explain.