

# Homework

- 1. Give two example computer applications for which connection-oriented service is appropriate. Now give two examples for which connectionless service is best.
- 2. Consider the network of Fig. 5-12(a). Distance vector routing is used, and the following vectors have just come in to router *C*: *from B*: (5, 0, 8, 12, 6, 2); *from D*: (16, 12, 6, 0, 9, 10); and *from E*: (7, 6, 3, 9, 0, 4). The cost of the links from *C* to *B*, *D*, and *E*, are 6, 3, and 5, respectively. What is *C*'s new routing table? Give both the outgoing line to use and the cost.
- 3. Please give an example in which the poisoned reverse technique cannot prevent the **count-to-infinity** problem and explain why.

- **4.** A router has just received the following new IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21, and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?
- **5.** The set of IP addresses from 29.18.0.0 to 29.18.128.255 has been aggregated to 29.18.0.0/17. However, there is a gap of 1024 unassigned addresses from 29.18.60.0 to 29.18.63.255 that are now suddenly assigned to a host using a different outgoing line. Is it now necessary to split up the aggregate address into its constituent blocks, add the new block to the table, and then see if any reaggregation is possible? If not, what can be done instead?

- **6.** A router has the following (CIDR) entries in its routing table:

Address/mask   Next hop

135.46.56.0/22   Interface 0

135.46.60.0/22   Interface 1

192.53.40.0/23   Router 1

default   Router 2

For each of the following IP addresses, what does the router do if a packet with that address arrives?

(a) 135.46.63.10

(b) 135.46.57.14

(c) 135.46.52.2

(d) 192.53.40.7

(e) 192.53.56.7

- **7.** When the IPv6 protocol is introduced, does the ARP protocol have to be changed? If so, are the changes conceptual or technical?
- **8.** 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?
- **9.** A token bucket scheme is used for traffic shaping. A new token is put into the bucket every 5  $\mu$ sec. Each token is good for one short packet, which contains 48 bytes of data. What is the maximum sustainable data rate?