Assignment Four

Due Date: 11:00 AM, April 10, 2014
Written Assignment (50 points)
Please provide your answers with clear explanations of how to get them.
Please write your full name, computer science account ID and last five digits of your ISU student ID on the paper.

1. Consider the network below.

   a. Suppose that this network is a datagram network. Show the forwarding table in router A, such that all traffic destined to H3 is forwarded through interface 3.
   b. Now suppose that this network is a virtual circuit network and that there is one ongoing call between H1 and H3, and another ongoing call between H2 and H3. Write down a forwarding table in router A, such that all traffic from H1 destined to host H3 is forwarded through interface 3, while all traffic from H2 destined to host H3 is forwarded through interface 4. (Page 425 P4)

2. Consider a router that interconnects three subnets: Subnet 1, Subnet 2, and Subnet 3. Suppose all of the interfaces in each of these three subnets are required to have the prefix 223.1.17/24. Also suppose that Subnet 1 is required to support up to 63 interfaces, Subnet 2 is required to support up to 95 interfaces, and Subnet 3 is required to support up to 16 interfaces. Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraints. (Page 428 P12)

3. Consider a subnet with prefix 128.119.40.128/26. Give an example of one IP address (of form xxx.xxx.xxx.xxx) that can be assigned to this network. Suppose an ISP owns the block of addresses of the form 128.119.40.64/25. Suppose it wants to create four subnets from this block, with each block having the same number of IP addresses. What are the prefixes (of form a.b.c.d/x) for the four subnets? (Page 428 P15)

4. Consider the network shown below, and assume that each node initially knows the costs to each of its neighbors, do the following:
   a. Consider the distance-vector algorithm and show the distance table entries at node z.
b. Use Dijkstra’s shortest-path algorithm to compute the shortest path from z to all network nodes. Show how the algorithm works by computing a table similar to Table 4.3. (Page 430 P24 P26)