# Tutorial Sheet 4 – Computer Networks 15CSE312

Q1. 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 at least 60 interfaces, Subnet 2 is to support at least 90 interfaces, and Subnet 3 is to support at least 12 interfaces. Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraint.

Q2 Consider the topology shown in the following Figure Q2. Denote the three subnets with hosts (starting clockwise at 12:00) as Networks A, B, and C. Denote the subnets

without hosts as Networks D, E, and F.

a. Assign network addresses to each of these six subnets, with the following

constraints: All addresses must be allocated from 214.97.254/23;

Subnet A should have enough addresses to support 250 interfaces; Subnet

B should have enough addresses to support 120 interfaces; and

Subnet C should have enough addresses to support 120 interfaces. Of

course, subnets D, E and F should each be able to support two interfaces.

For each subnet, the assignment should take the form a.b.c.d/x or

a.b.c.d/x – e.f.g.h/y.

b. Using your answer to part (a), provide the forwarding tables (using longest

prefix matching) for each of the three routers.



FIGURE Q2

Q3. Consider Figure Q3, Suppose there is another router w, connected to router

y and z. The costs of all links are given as follows: c(x,y) = 4, c(x,z) = 50,

c(y,w) = 1, c(z,w) = 1, c(y,z) = 3. Suppose that poisoned reverse is used in the

distance-vector routing algorithm.

a. When the distance vector routing is stabilized, router w, y, and z inform their

distances to x to each other. What distance values do they tell each other?

b. Now suppose that the link cost between x and y increases to 60. Will there

be a count-to-infinity problem even if poisoned reverse is used? Why or

why not? If there is a count-to-infinity problem, then how many iterations

are needed for the distance-vector routing to reach a stable state again?

Justify your answer.



Figure Q3

Q4. Consider the network shown below, and assume that each node initially

knows the costs to each of its neighbors. Consider the distance-vector

algorithm and show the distance table entries at node z.



Q5 Consider a router inside a home that gets IP address 25.36.111.235 and Network address in the home network is of type 192.166.23.1/24. Assign IP address to all 4 hosts that the home has. If each host has a connection to port 91 on the host 10.128.212.86, provide the entries in NAT table.