SOLUTION ASSIGNMENT-05 6A

REVIEW QUESTIONS

R5. The count-to-infinity problem refers to a problem of distance vector routing. The problem means that it takes a long time for a distance vector routing algorithm to converge when there is a link cost increase. For example, consider a network of three nodes x, y, and z. Suppose initially the link costs are c(x,y)=4, c(x,z)=50, and c(y,z)=1. The result of distance-vector routing algorithm says that z's path to x is z→y→ x and the cost is 5(=4+1). When the cost of link (x,y) increases from 4 to 60, it will take 44 iterations of running the distance-vector routing algorithm for node z to realize that its new least-cost path to x is via its direct link to x, and hence y will also realize its least-cost path to x is via z.

R6. No. Each AS has administrative autonomy for routing within an AS.

R11. Routers use the AS-PATH attribute to detect and prevent looping advertisements; they also use it in choosing among multiple paths to the same prefix. The NEXTHOP attribute indicates the IP address of the first router along an advertised path (outside of the AS receiving the advertisement) to a given prefix. When configuring its forwarding table, a router uses the NEXT-HOP attribute.

R13. False. A BGP router can choose not to add its own identity to the received path and then send that new path on to all of its neighbors, as BGP is a policy-based routing protocol. This can happen in the following scenario. The destination of the received path is some other AS, instead of the BGP router's AS, and the BGP router does not want to work as a transit router.

PROBLEMS

Problem 4

c)

Step	N'	D(x), p(x)	D(u),p(u)	D(t),pt)	D(w),p(w)	D(y),p(y)	D(z),p(z)
	v	3,v	3,v	4,v	4,v	8,v	∞
	vx	3,v	3,v	4,v	4,v	8,v	11,x
	vxu	3,v	3,v	4,v	4,v	8,v	11,x
	vxut	3,v	3,v	4,v	4,v	8,v	11,x
	vxutw	3,v	3,v	4,v	4,v	8,v	11,x
	vxutwy	3,v	3,v	4,v	4,v	8,v	11,x
	vxutwyz	3,v	3,v	4,v	4,v	8,v	11,x

Problem 16

One way for C to force B to hand over all of B's traffic to D on the east coast is for C to only advertise its route to D via its east coast peering point with C.

Problem 19

A should advise to B two routes, AS-paths A-W and A-V. A should advise to C only one route, A-V. C receives AS paths: B-A-W, B-A-V, A-V.

Problem 20

Since Z wants to transit Y's traffic, Z will send route advertisements to Y. In this manner, when Y has a datagram that is destined to an IP that can be reached through Z, Y will have the option of sending the datagram through Z. However, if Z advertises routes to Y, Y can re-advertise those routes to X. Therefore, in this case, there is nothing Z can do from preventing traffic from X to transit through Z.