Computer Networks HW 6

Shane Cincotta

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Chapter 5, Problem 3

Step	N'	D(t), p(t)	D(u), p(u)	D(v), p(v)	D(w), p(w)	D(y), p(y)	D(z), p(z)
0	x	inf	inf	3,x	6,x	6,x	8,x
1	xv	7,v	6,v	3,x	6,x	6,x	8,x
2	xvu	7,v	6,v	3,x	6,x	6,x	8,x
3	xvuw	7,v	6,v	3,x	6,x	6,x	8,x
4	xvuwy	7,v	6,v	3,x	6,x	6,x	8,x
5	xvuwyt	7,v	6,v	3,x	6,x	6,x	8,x
6	xvuwytz	7,v	6,v	3,x	6,x	6,x	8,x

Thus the shortest paths from x along with their costs is: t:xvt = 7, u:xvu = 6, v:xv = 3, w:xw = 6, y:xy = 6 and z:xz = 8

Chapter 5, Problem 5

	u	v	x	y	z
u	0	1	4	2	6
v	1	0	3	3	5
x	4	3	0	3	2
y	2	3	3	0	5
z	6	5	2	5	0

Chapter 5, Problem 7

a

Node	Description	Min Cost	Hop
X	Min cost from x to x	0	N/A
W	Min cost from x to w	2	-
Y	Min cost from x to y via w	4	W
U	Min cost from x to u	7	W

b

A change in c(x,y) ≤ 1 will result in x passing any changes onto its neighbors.

When c(x,y) = $\delta \leq 1$ then the hop done at y passes through the cose $\delta + 6$ and node x will inform it's neighbors (y and w) of the new cost

c

When c(x,y) –¿5 is less than the min cost path from x to u (7), thus the cost is still at least 7. The change in the cost of the link will not cause node x to inform it's neighbors of the new minimum cost path

Chapter 5, Problem 14

a

Router 3c learns about prefix x from eBGP protocol

b

Router 3a learns about prefix x from iBGP protocol

c

Router 1c learns about x from from eBGP protocol

d

Router 1d learns about x from from iBGP protocol

Chapter 5, Problem 15

a

I will be equal to I_1 because the interface begins the least cost path at 1d towards the gateway router 1c

b

I will be set to I_2 because router 1d learns about x from router 1b via AS2 through I_2 and learns x from router 1a via AS3 through I_1

c

I will be set to I_1 because router 1d learns about x from router 1b via AS2 and reaches AS4 to get the value of x using the path I_2

Chapter 5, Problem 17

a

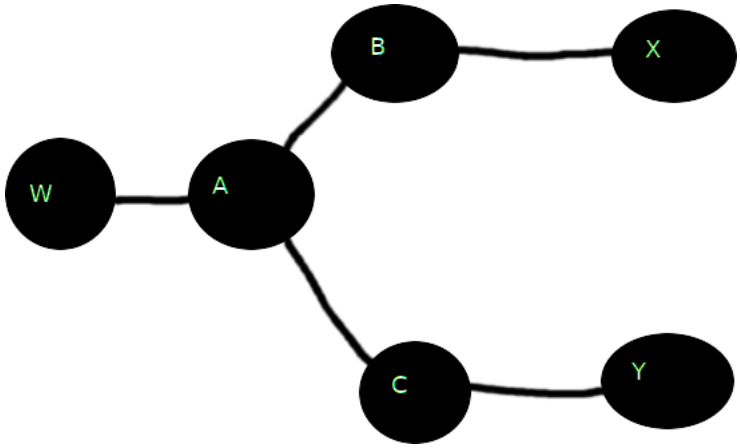

Figure 1: W's view of the topology

The stub network W contains a path to the AS A. The AS advertises the path of B and C to W, thus W can reach networks X and Y from A-B-X and A-C-Y (A doesn't know the path between B-C from W)

b

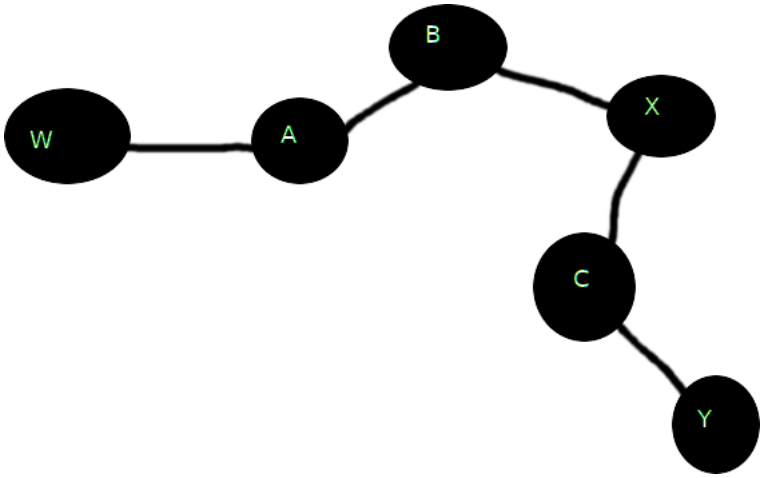

Figure 2: X's view of the topology

X is a stubnetwork because it has two different providers, thus it receives from two prodvider networks. For the first provider network, x receives from B and learns the path B-A-W. For the second provider network, x receives from C and learns the path C-Y to reach Y (without knowing the link between A to C)

Chapter 5, Problem 20

Yes BGP allows Z to implement this policy. The BGP protocol allows Z to implement the policu by the way the BGP routes are handled. That is, Y should advertise Xm X is unaware that Y has a path to Z and never forwards the traffic