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CS 4480 - Homework Assignment 6

P17

a. Following are the network addresses for the subnets with hosts (supporing at least 250 clients for A, 120 clients for B, and 120 clients for C):

A: 214.97.254.0/24
B: 214.97.255.0/25
C: 214.97.255.128/25

And following are the network addresses for the subnets between routers (supporting a minimum of two interfaces):

D: 214.97.255.248/29
E: 214.97.255.252/30
F: 214.97.255.254/31

b. Following are the forwarding tables (using longest prefix matching) for each of the three routers:

R1 Forwarding Table	
Prefix Match	Link Interface
11010110 01100001 11111110	A
11010110 01100001 11111111 11111	D
11010110 01100001 11111111 1111111	F

R2 Forwarding Table	
Prefix Match	Link Interface
11010110 01100001 11111111 1	C
11010110 01100001 11111111 111111	E
11010110 01100001 11111111 1111111	F

R3 Forwarding Table	
Prefix Match	Link Interface
11010110 01100001 11111111 0	B
11010110 01100001 11111111 11111	D
11010110 01100001 11111111 111111	E

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a. The addresses for the three host interfaces will become...

    192.168.1.1
    192.168.1.2
    192.168.1.3

...and the address for the LAN interface of the router will become:

    192.168.1.4

b. Here's one possibility for the NAT table:

WAN side	LAN side
24.34.112.235, 5001	192.168.1.1, 3345
24.34.112.235, 5002	192.168.1.1, 3346
24.34.112.235, 5003	192.168.1.2, 3345
24.34.112.235, 5004	192.168.1.2, 3346
24.34.112.235, 5005	192.168.1.3, 3345
24.34.112.235, 5006	192.168.1.3, 3346

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step	N'	D(v),p(v)	D(w),p(w)	D(y),p(y)	D(z),p(z)	D(u),p(u)	D(t),p(t)
0	x	3,x	6,x	6,x	8,x	∞	∞
1	xv		6,x	6,x	8,x	6,v	7,v
2	xvw	3,x		6,x	8,x	6,v	7,v
3	xvwy	3,x	6,x		8,x	6,v	7,v
4	xvwyu	3,x	6,x	6,x	8,x		7,v
5	xvwyut	3,x	6,x	6,x	8,x	6,v	
6	xvwyutz	3,x	6,x	6,x		6,v	7,v

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Following is the distance table for node z at each iteration of the distance-vector algorithm that affects node z:

node z table (iteration 0)						
		cost to				
		u	v	x	y	z
from	u	∞	∞	∞	∞	∞
	v	∞	∞	∞	∞	∞
	x	∞	∞	∞	∞	∞
	y	∞	∞	∞	∞	∞
	z	∞	6	2	∞	0

node z table (iteration 1)						
		cost to				
		u	v	x	y	z
from	u	∞	∞	∞	∞	∞
	v	1	0	3	∞	6
	x	∞	3	0	3	2
	y	∞	∞	∞	∞	∞
	z	∞	6	2	∞	0

node z table (iteration 2)						
		cost to				
		u	v	x	y	z
from	u	∞	∞	∞	∞	∞
	v	1	0	3	3	5
	x	4	3	0	3	2
	y	∞	∞	∞	∞	∞
	z	6	5	2	5	0

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a. eBGP

b. iBGP

c. eBGP

d. iBGP

P38

a. It will be equal to the one with the least cost path to x. In this case, we only have enough information to say that it could be either I_1 or I_2.

b. In this case, hot-potato routing and the least-cost path will be used to make the determination.

c. Once again, hot-potato routing and the least-cost path will be used to make the determination.

P40

Network stub W knows that its NEXT-HOP leads to network A. However, it might use B or C to reach network stub X, and B or C to reach network stub Y.

Network stub might use B or C to reach network stub W, and B or C to reach network stub Y.

In both cases, the routes could be dependent on the costs associated with the routes, or even policy agreements (due to peering relationships) between A, B, and C.

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A should advertise to B that it has routes to both V and W. A should advertise to C that it does not have a route to W.