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CSCI - 4273

Problem Set 2

1. a. Yes this is a valid address because it follows the basic formation of IP, Mask, and network addressing.

   b.

2. a. Possible Arrangements for Hosts are as follows for subnet masks:

   A. 255.255.254.0/24

   B. 255.255.255.128/23

   C: 255.255.255.192/24

   D. 255.255.255.244/24 (pretty sure this is correct since I gave 63 hosts for D.

   b. If this was the case that the number of hosts was increased then we would need to find a way to change the ask for who may host sections we are allocating for department C since we only need 1 more host for D in this case because I already allocated space for 63 hosts.

3.

	A	B	C	D	E	F
A	0	5	2	inf	inf	inf
B	5	0	inf	2	inf	inf
C	2	inf	0	inf	2	inf
D	inf	2	3	0	inf	4
E	inf	inf	2	inf	0	4
F	inf	inf	inf	4	4	0

	A	B	C	D	E	F
A	0	5	2	5	4	inf
B	5	0	5	2	inf	6
C	2	2	0	3	2	6
D	5	2	3	0	5	4
E	4	inf	2	5	0	4
F	inf	6	6	4	4	0

	A	B	C	D	E	F
A	0	5	2	5	4	8
B	5	0	5	2	8	6
C	2	2	0	3	2	6
D	5	2	3	0	5	4
E	4	7	2	5	0	4
F	9	6	6	4	4	0

4.

Destination	Cost	NextHop
A	inf	-
B	2	B
C	3	A/C
E	inf	-
F	4	F

Destination	Cost	NextHop
A	5	A
B	2	B
C	3	A/C
E	5	E
F	4	F

5. a. The main difference between CSMA/CD and CSMA/CA is that CA is built from CD in respect that is is able to have collision avoidance.

b. collision is more complex in wireless networks because there is physical boundaries and obstacles that cause interference.

c. Hidden terminals can be detected in 802.1 networks by detecting neighbor nodes. This works by nodes invoking the presence of their neighboring nodes while between their destinations.

6. a. First the packet will traverse and reach its R1 router because this is in its interface and its destination is not in its subnet. From the R1 router it will then reach to the address hop form R1 to 128.96.34.129

Subnet Number	Subnet mask	NextHop
128.96.34.0	255.255.255.128	Interface0
128.96.34.129	255.255.255.128	Interface1

b. This packet would try to traverse to to the subnet that H1 resides because the host number that it is trying to connect to is in this subnet or above it. It will try and use its mask first to see if its subnet number reveals its in its subnet first and since it isn't then it will send its packet to R2. use this subnet number in R2 to see if its in this subnet, if not it will move to R1 then having reached the destination.

c. used a subnet mask of 255.255.255.128. using what is left of the host numbers for the use of the rest of this mask. This well then have a subnet that will have the subnet number of part b in it.

7. src MAC dst MAC src IP dst IP

B-> R3

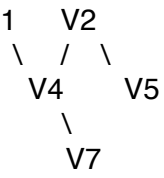
R3->R2

R2 -> R4

R4 -> C

8. Well, for one I know from my algorithms course that Dijkstras Algorithm fails on negative weights because of the ways that it relaxes edges and can fail to really find a shortest path when dealing with these weights.

The graph though is as follows: With shortest path being 2+4+2+4 = 12



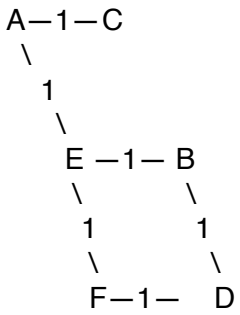
9. a. For A to win it will be done at a probability of 1/2 of the time and for B to win it will be at a probability of 3/8 the time. Therefore the probability that A will win will be 3/8 of the time.

b. The same will be as above with A winning at a 1/2 and this time B will be at 7/8 of the time. Therefore the chance that A wins immediately will be 7/16 of the time.

c. From a source found online this is a reoccurring equation that goes on as (2^n - 2)/2^n and calculates down to an approximate value of .82 that turns out to be a lower bound.

d. What till happen to B is the “Ethernet Capture Effect” where A has captured the link and B is unlikely to win any other back races.

10.



11. a.

Node Y	X	Z
x	60	52
Node Z	x	y
x	50	51

b. This was answered in the above section

c. This underwent a total 5 updates if you want to count the convergence as a step. If not there as a total of 4 steps.

12. First the browser will have to exchange an initial handsake package with simple header information and its addresses for its destination. This is simple information in the packet header. No actual data is being sent at this point. The protocol that is used generally going to be TCP.