

COMP 2322 Computer Networking

Homework 5

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Question 1

1)

a) Router 3c learns eBGP about prefix x

b) Router 1d learns iBGP about prefix x

2)

a)

Yes. Router 1d learns about x it will put an entry (x, I) in its forwarding table. Let's consider the path from router 1d to router 1a. Then for path I_1 , will have 1 jump from router 1d to router 1a for least-cost path; for path I_2 , it will have 2 jumps from router 1d to router 1a for least-cost path. Then I will be equal to I_1 or I_2 .

b)

Assume there's physical link between AS2 and AS4 (between router 4a and router 2c), and router "1d" learns that x is accessible through AS2 as well as via AS3. Then AS path are same, both have 2 jumps from AS1 to AS4 via AS2 and AS3, so I will be set to I_1 or I_2 .

c)

Suppose there is another AS, called AS5, which lies on the path between AS2 and AS4, and router 1d learns that x is accessible via AS2 AS5 AS4 as well as via AS3 AS4. Path I_1 will have shorter AS path with only 2 jumps, and path I_2 will have longer AS path with 3 jumps. Then I will be set to I_1 .

3)

a)

$$L = 1000 \text{ bytes: transmission overhead} = \frac{5}{5+1000} = 0.497\%$$

$$L = 100 \text{ bytes: transmission overhead} = \frac{5}{5+100} = 4.76\%$$

b)

$$\text{Packetization Delay} = \frac{L \times 8}{128 \times 10^3} \text{ sec} = \frac{L}{16} \text{ msec}$$

$$L = 1000 \text{ bytes: delay} = \frac{1000}{16} \text{ msec} = 62.5 \text{ msec}$$

$$L = 100 \text{ bytes: delay} = \frac{100}{16} \text{ msec} = 6.25 \text{ msec}$$