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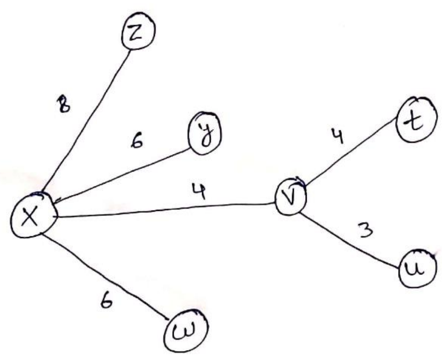
Subject: TCP/IP

Assignment: 11

P3. Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from x to all network nodes. Show how the algorithm works by computing a table similar to Table 5.1

Ans.

Steps	N'	t	u	v	w	y	z
1	x	∞	∞	∞	∞	∞	∞
2	x	∞	∞	4 (xv)	6 (xw)	6 (xy)	8 (xz)
3	xvwyz	13 (xyt)	17 (xyvu)	4 (xv)	6 (xw)	6 (xy)	8 (xz)
4	xvwyz	8 (xvt)	9 (xwu)	4 (xv)	6 (xw)	6 (xy)	8 (xz)
5	xvwyzt	8 (xvt)	7 (xvu)	4 (xv)	6 (xw)	6 (xy)	8 (xz)



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P4. Consider the network shown in Problem P3. Using Dijkstra's algorithm, and showing your work using a table similar to Table 5.1, do the following:

a. Compute the shortest path from t to all network nodes.

b. Compute the shortest path from u to all network nodes.

c. Compute the shortest path from v to all network nodes.

d. Compute the shortest path from w to all network nodes.

e. Compute the shortest path from y to all network nodes.

f. Compute the shortest path from z to all network nodes.

Ans. For t

step	node	dpdt	dupu	dvpv	dwpw	dxpx	dypy
0	t	2,t	4,t	i	i	7,t	i
1	tu	2,t	4,t	5,u	i	7,t	i
2	tuv	2,t	4,t	5,u	7,v	7,t	i
3	tuvw	2,t	4,t	5,u	7,v	7,t	i
4	tubwx	2,t	4,t	5,u	7,v	7,t	15,x
5	tubwxy	2,t	4,t	5,u	7,v	7,t	15,x
6	tuvwxyz	2t	4,t	5,u	7,v	7,t	15,x

For y

step	node	dpdt	dupu	dvpv	dwpw	dxpx	dypy
0	y	7,y	I	8,y	I	6,y	12,y
1	yx	7,y	I	8,y	12,x	6,y	12,y
2	yxt	7,y	9,t	8,y	12,x	6,y	12,y
3	tuvw	7,y	9,t	5,u	12,x	6,y	12,y
4	tubwx	7,y	9,t	5,u	12,x	6,y	12,y
5	tubwxy	7,y	9,t	5,u	12,x	6,y	12,y
6	tuvwxyz	7,y	9,t	5,u	12,x	6,y	12,y

P5. Consider the network shown below, and assume that each node initially knows the costs to each of its neighbors. Consider the distance-vector algorithm and show the distance table entries at node z.

Ans.

	U	V	X	Y	Z
U					

V					6
X					2
Y					
Z		6	2		0

ENTRIES TABLE of router Z.

Initially when routers doesn't know the value to other routers except its neighbours then it will put value to those router either black or infinity, indicate that it can not be explored from information that have at that time.

But when routers are share their routing tables with their neighbours then it will be updated by comparing with old value to reach each router if updated value is minimum then present value.

P7. Consider the network fragment shown below. x has only two attached neighbors, w and y. w has a minimum-cost path to destination u (not shown) of 5, and y has a minimum-cost path to u of 6. The complete paths from w and y to u (and between w and y) are not shown. All link costs in the network have strictly positive integer values

Ans a. From the diagram given:

- Minimum cost path from **node w to node u = 5.**
- Minimum cost path from **node w to node y = 6.**

Distance-vectors from **node x** are as follows:

Vx(w) = 2

Vx(y) = 5

Vx(u) = ∞

After first iteration, by considering the neighbors of **node y** and **node w** from **x:**

Vx(w) = 2

Vx(y) = 4

Vx(u) = 7

Ans b. If **c(x,y)** becomes larger or smaller (as long as c(x,y) >= 1) ,

- The least cost path from **x to u** will still have cost at least **7**.
- Thus a change in c(x,y) (if c(x,y)>=1) **will not cause x** to inform its neighbors of any changes.

If **c(x,y) = δ<1**, then the least cost path now passes through y and has cost **δ+6.**

If **c(x,w) = ε ≤ 1**, then the least-cost path to **u** continues to pass through **w** and its cost changes to **5 + ε;**

- x will inform its neighbors of this new cost.

If **c(x,w) = δ > 6**, then the least cost path now passes through **y** and has **cost 11**; again **x will inform** its neighbors of this new cost.

P14. Consider the network shown below. Suppose AS3 and AS2 are running OSPF for their intra-AS routing protocol. Suppose AS1 and AS4 are running RIP for their intra-AS routing protocol. Suppose eBGP and iBGP are used for the inter-AS routing protocol. Initially suppose there is no physical link between AS2 and AS4. a. Router 3c learns about prefix x from which routing protocol: OSPF, RIP, eBGP, or iBGP? b. Router 3a learns about x from which routing protocol? c. Router 1c learns about x from which routing protocol? d. Router 1d learns about x from which routing protocol?

Ans

a)The answer is eBGP.

The eBGP is inter-routing protocol. AS3 is physically connected to AS2 through OSPF .generally eBGO is a BGP conn which span 2 AS's..AS3 is connected physically to 4c. The 3c router is in AS3. 3c and 4c are peering routers and are connected by eBGP.

b)iBGP.

Even the router 3a not connected directly to AS4, its in AS3 , so eBPG is used by 3c.

The remaining all the router is AS3 will use IBGP with AS4 to connect.

c) eBGP.

AS3 will transmit each of its prefix info by using AS1 due to the router 1c is directly connected with AS3.

d)iBGP.