CS & IT ENGINEERING

COMPUTER NETWORKS

Routing Protocols

Lecture No- 03

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- **Routing Algorithms**
  - **Distance vector routing**
  - **Link state routing**

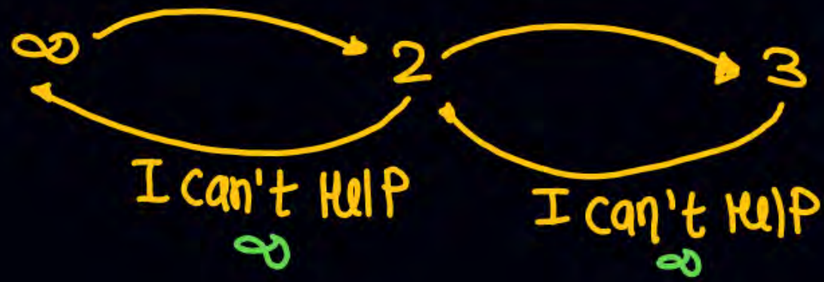
Split Horizon Solution

Dest.	Dist.	NH
A	~~1~~ ∞	A –

Dest.	Dis.	NH
A	2	B

Dest.	Dis.	NH
A	3	C

1 2 3

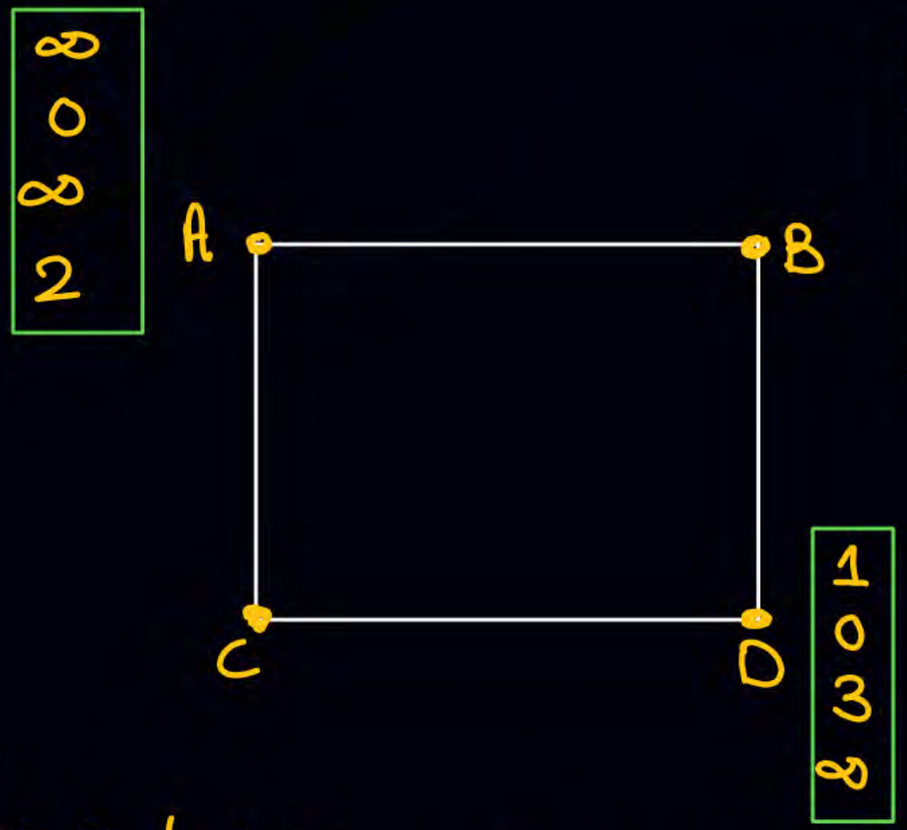


∞ ∞ ∞

Q:

Routing table of B

Dest.	Dis.	NH
A	1	A
B	0	B
C	3	A
D	2	D



What Distance vector 'B' will share to 'A' and 'D' by using split Horizon concept ?

Note

① Count to infinity Problem

② Infinite looping Problem

- Convergence Problem is not solved by split Horizon.
- To solve convergence Problem we use Link state Routing

Topic : Disadvantage of DVR

Statement for 1 and 2 4M → 2M + 2M

Consider a network with five nodes, N1 to N5 as shown below.

The network uses a Distance Vector Routing Protocol. Once the routes have stabilized, the distance vectors at different nodes are as following.

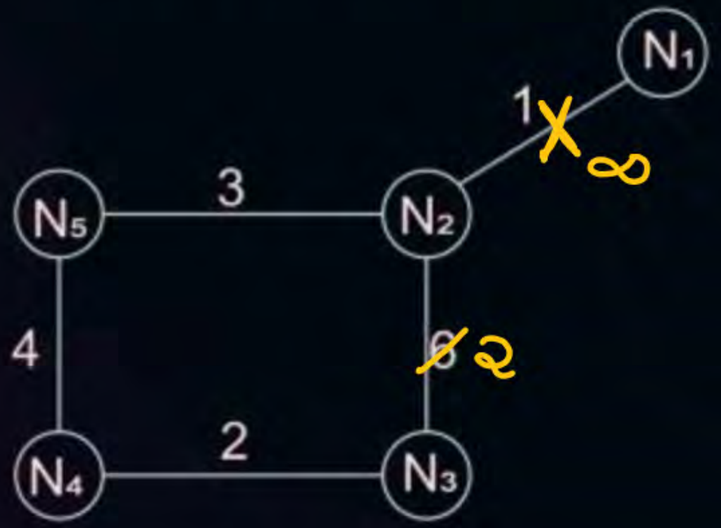
N1: (0, 1, 7, 8, 4)

N2: (1, 0, 6, 7, 3)

N3: (7, 6, 0, 2, 6)

N4: (8, 7, 2, 0, 4)

N5: (4, 3, 6, 4, 0)



Each distance vector is the distance of the best known path at that instance to nodes, N1 to N5, where the distance to itself is 0. Also, all links are symmetric and the cost is identical in both directions. In each round, all nodes exchange their distance vectors with their respective neighbours. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors.

Topic : Disadvantage of DVR

#Q. The cost of link N2-N3 reduces to 2 (in both directions). After the next round of updates, what will be the new distance vector at node, N3?

A. (3, 2, 0, 2, 5)

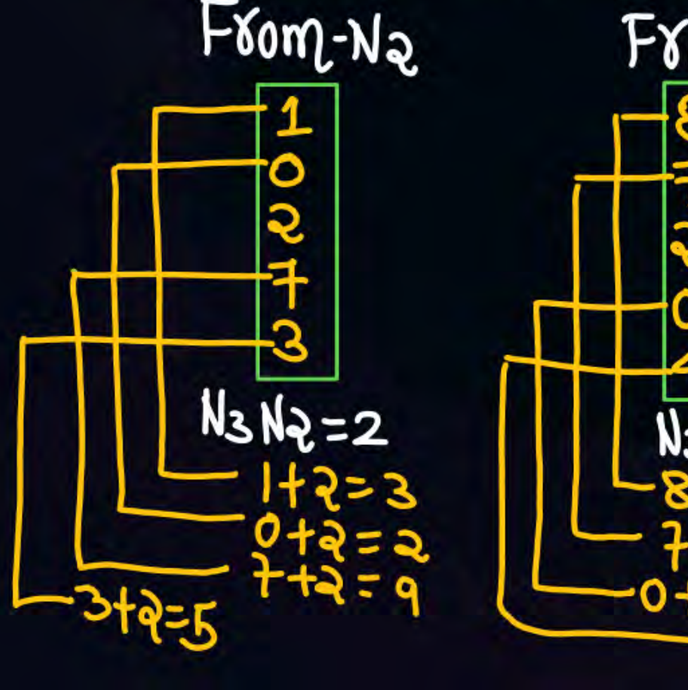
B. (3, 2, 0, 2, 6)

C. (7, 2, 0, 2, 5)

D. (7, 2, 0, 2, 6)

At N_3

N_3 Received Distance Vector From N_2, N_4



N_3 → New Routing table

Dest	Dis	NH
N_1	3	N_2
N_2	2	N_2
N_3	0	N_3
N_4	2	N_4
N_5	5	N_2

Topic : Disadvantage of DVR

#Q. After the update in the previous question, the link N1-N2 goes down. N2 will reflect this change immediately in its distance vector as cost, ∞. After the NEXT ROUND of update, what will be the cost to N1 in the distance vector of N3?

A. 3

B. 9

C. 10 ✓

D. ∞

At N_3

N_3 Rcvd DV From N_2, N_4

From N_2

∞
0
2
7
3

$N_3N_2 = 2$

$\infty + 2 = \infty$

From - N_4

8
7
2
0
4

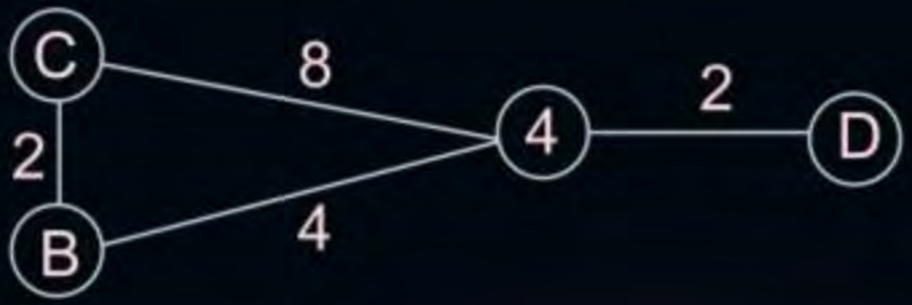
$N_3N_4 = 2$

$8 + 2 = 10$

N_3 → New Routing table

Dest.	Dis.	NH
N_1	10	N_4
N_2		
N_3	0	N_3
N_4		
N_5		

Topic : Node instability after split horizon



Note: Here circle after split horixon packet D/s loading s/w these 3 Nodes.

A	B	C
2	6	8
∞	6	8
16	6	8
16	20	8
16	20	22
30	30	22
30	34	36
∞	∞	∞

THANK YOU!