

CS4450 Problem Set #3

March 5, 2019

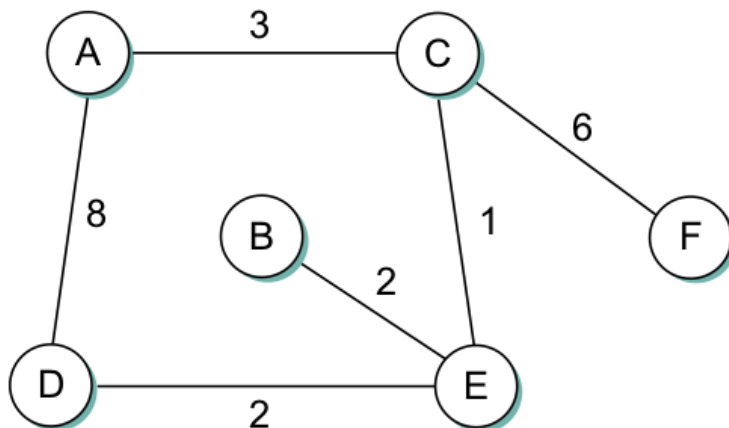
1 Forwarding Tables

A		
Node	Cost	Nexthop
B	1	B
C	1	C
D	2	B
F	2	C

F		
Node	Cost	Nexthop
A	2	C
B	3	C
C	1	C
D	2	C
E	1	E

Suppose we have a network in which all links have cost 1. Suppose the above forwarding tables are given for nodes A and F. Give a diagram of the smallest network consistent with these tables.

2 Distance-Vector Routing



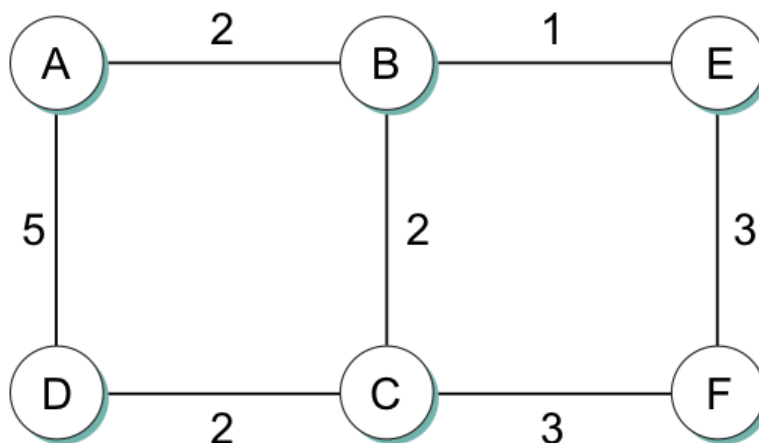
In the above network, links are labeled with costs. Assume distance-vector routing.

- a) Give the routing tables for this network such that each packet is forwarded via the lowest-cost path to its destination.

Now, assume the C-E link fails. Give the forwarding tables of

- b) A, B, D after C and E have reported the news.
- c) A and D after their next mutual exchange.
- d) C after A exchanges with it.

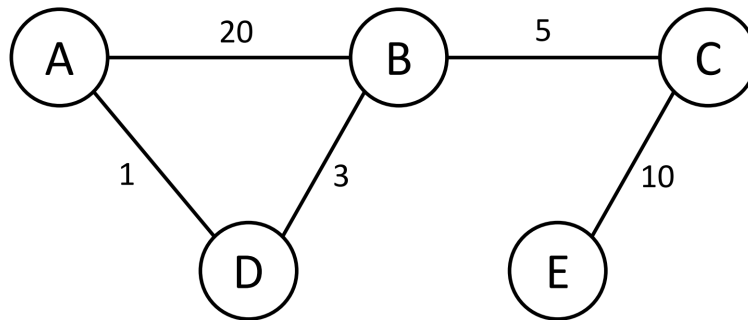
3 Distance-Vectors



In the above network, links are labeled with costs. Assume we have distance-vector routing. Give the routing tables when

- Each node knows only the distances to its immediate neighbors.
- Each node has reported the information it had in the preceding step to its immediate neighbors.
- Step (b) happens a second time.
- Step (b) happens a third time.

4 Count-to-infinity Problem



In the above network, links are labeled with costs. Assume we use the basic distance vector algorithm.

- Give the routing tables.
- What will happen if the link between B and D fails? Perform the first three iterations of the algorithm following the failure.
- Assume each node broadcasts its routing information every t seconds, calculate how long it takes for the routing tables on different nodes to become stable again.
- In class, we have discussed *poisoned reverse*. Explain how *poisoned reverse* fixes this problem.
- Identify a scenario using the network given in which *poisoned reverse* fails. What solutions could we use then?