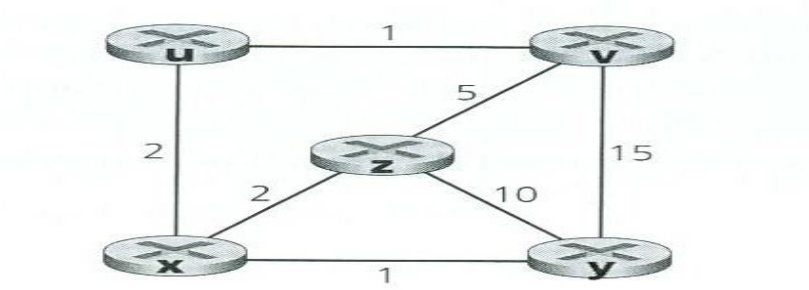
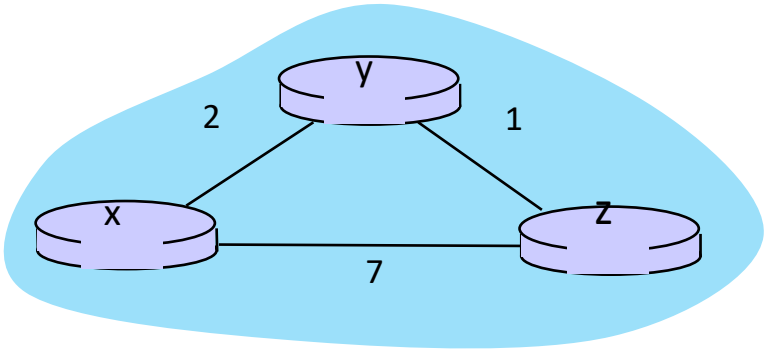
CS5222 Computer Networks and Internets

Tutorial 10 (Week 11), 2024

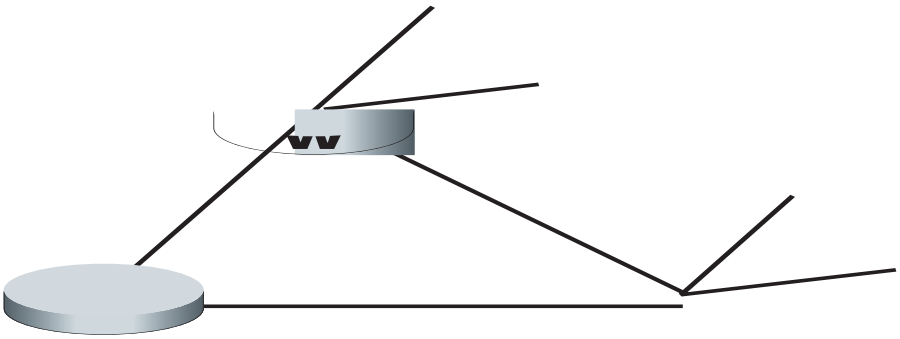
1. Consider the network shown below and assume that each node initially knows the costs to each of its neighbors. Consider the distance vector algorithm and show the distance vector entries of node z at each step of the algorithm.



2. Consider the distance vector algorithm for the network below and show the distance vector entries of <u>each</u> node at each step of the algorithm.

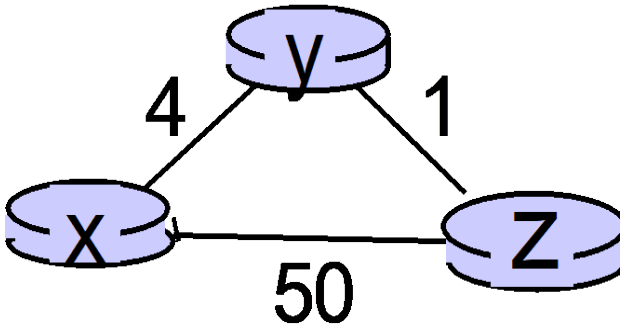


3. Consider the network fragment shown below. x has only two attached neighbors, w and y. w has a minimum-cost path to destination u (not shown) of 5, and y has a minimum-cost path to u of 6. The complete paths from w and y to u (and between w and y) are not shown. All link costs in the network have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



Give x's distance vector for destinations w, y, and u.

4. **[Difficult]** Consider the network below. Suppose the link cost between x and y increases to 60. Recall that, in the lecture, we discussed that it will take a long time until the distance vector algorithm finally stabilizes (≥40 iterations) due to the count-to-infinity problem. Describe a modification of the distance vector algorithm that correctly computes the distance vectors and avoids the count-to-infinity problem in this specific scenario.



5. Describe how loops in paths can be detected in BGP.

6. Though we have link state and distance vector routing algorithms to find the least cost paths, the end-to-end path in today's Internet may not be the path with the best end-to-end performance. What are the possible reasons?