| **COMPUTER SCIENCE**

CS6330/CS4330: COMPUTER NETWORKS

ASSIGNMENT 5

R1. What is meant by a control plane that is based on per-router control? In such cases, when we say the network control and data planes are implemented "monolithically," what do we mean?

traditional routing. individual routing algorithms componenets in each and every router

R2. What is meant by a control plane that is based on logically centralized control? In such cases, are the data plane and the control plane implemented within the same device or in separate devices? Explain.

software defined network routing. in this case, control plane and data plane are implemented in different devices, the control plane is abstracted out into remote computer

R6. Is it necessary that every autonomous system use the same intra-AS routing algorithm? Why or why not?

All routers in the same AS must use the same intra-domain protocol.
Reasons: consistent routing, shared language, simplified configuration

R7. Why are different inter-AS and intra-AS protocols used in the Internet?

P1. Apply Dijkstra's routing algorithm to the networks in Figure 1. Provide a table and a figure similar to that of the lecture slides.

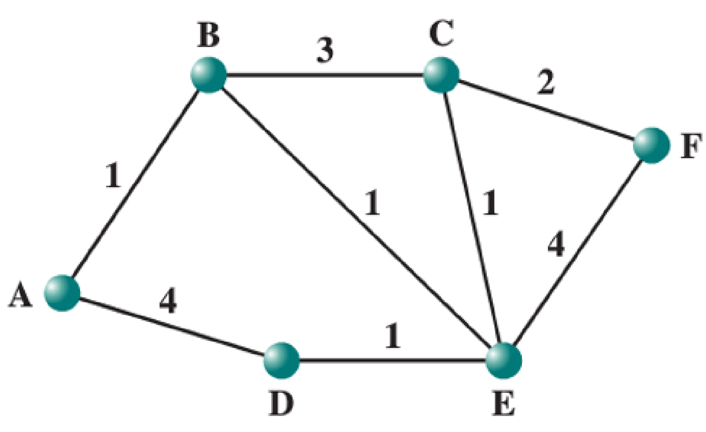
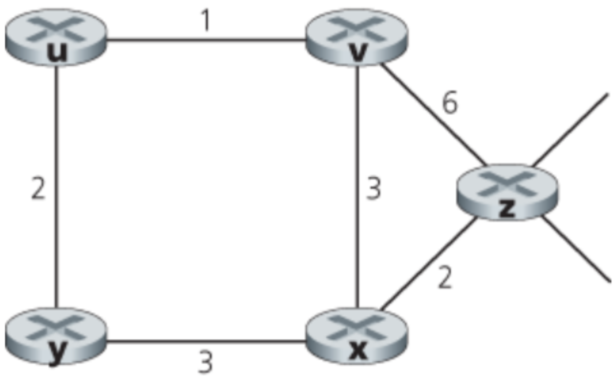
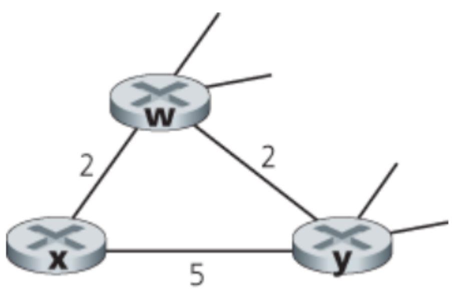


Figure 1: Packet-Switching Networks with Link Costs

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*.



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.



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

P8. Consider the three-node topology shown in **Figure 5.6**. Rather than having the link costs shown in **Figure 5.6**, the link costs are $c(x, y) = 3,\ c(y, z) = 6, c\,(z, x) = 4$. Compute the distance tables after the initialization step and after each iteration of a synchronous version of the distance-vector algorithm (as we did in our earlier discussion of **Figure 5.6**).

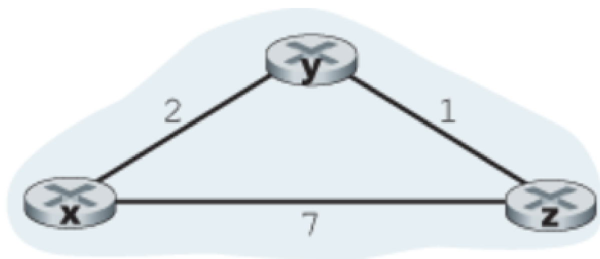


Figure 5.6 Distance-vector (DV) algorithm in operation

WIRESHARK LAB 5: ICMP

The lab has been uploaded to the Canvas system under the Wireshark Labs section. You are required to:

1. **submit** screenshots of your work
2. **answer** the questions in the lab document.