Principles of Internetworking Protocols

Assignment Nine (20 marks)
(Due on May 12)

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Instructions:

1. Submit a pdf file for your answers to i-Learning before 11:59 on May 12. Put down your name, student ID and program/year in your submission.
2. Late submission will not be accepted.
3. Observe also the penalty for plagiarism as stated in the Course Overview slides.

Question 1: OSPF I

[10 MARKS] We consider the network in Figure 1 again. But this time the routers use OSPF. You can use N1 for LAN 1, N2 for LAN 2 and so on. Answer the two questions below.

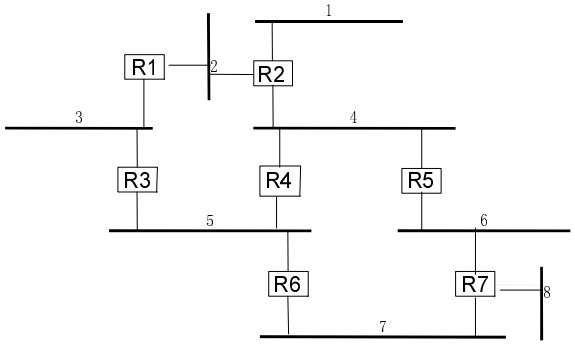

Figure 1: An IP network running OSPF protocol.

1. [5 MARKS] Draw the network topology resulted from the link-state routing protocol. The topology consists of nodes and links, and the nodes represent either routers or LANs.
2. [5 MARKS] Draw the spanning tree computed by $R4$.

Question 2: OSPF network II

[10 MARKS] Consider the OSPF network in Fig. 2. The costs of all the links (there are 20 of them) are set to 10 initially, and the link costs can be any positive integers. The routers B, C, D and E are meshed together to increase resilience against link and router failures.

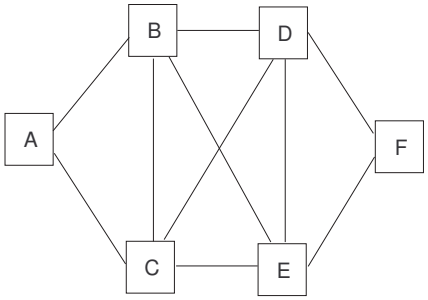

Figure 2: An OSPF network with 6 nodes.

1. [3 MARKS] How many possible best paths for A to reach F, and what are they?
2. [3 MARKS] Increase the link costs of at most 2 links just enough that the cross links $B - E$ and $C - D$ would not be used for A to reach F.
3. [4 MARKS] Can F influence the best paths originated from A by changing the costs of its links? Explain your answer.