

Homework 2

Due: 23 October 2007

Problem 1

Chapter 5, problems 6, 8, 48, and 49.

Problem 2

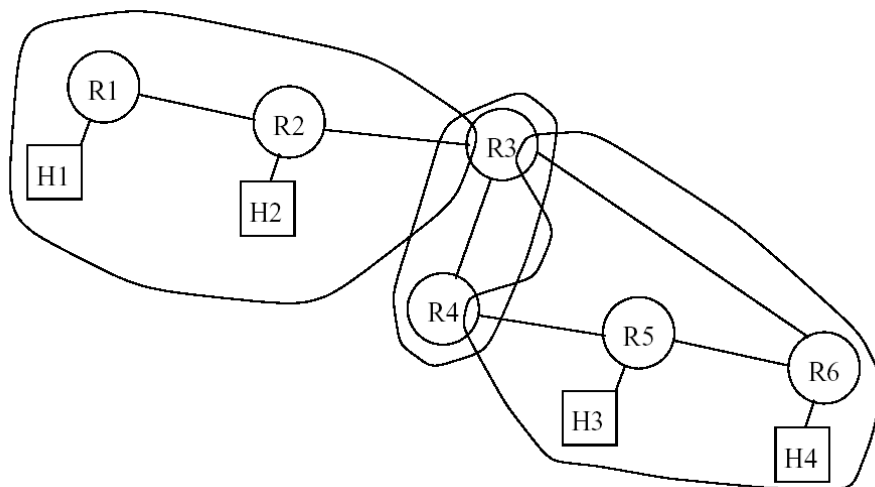
Consider the simplest three-router network: a straight line. There are three routers, A, B, and C. A is connected to B, and B is connected to C. A distance vector protocol is being used, with the cost from A to B equal to 1, and the cost from B to C equal to 2.

Suppose the link from B to C fails.

- a. Give a sequence of routing table updates that would lead to a routing loop.
- b. Estimate the probability of the loop assuming updates are sent every 60 seconds (starting from whatever moment the router happens to be brought up).
- c. Now estimate the probability if, in addition to the above, routers send updates within 1 second if a link they are connected to goes down.
- d. Now estimate the probability if split horizon is used.

Problem 3

Consider the following autonomous system, split into three areas:



Routing is done with OSPF (all links have cost of 1). Area 1 contains routers R1 and R2, and hosts H1 and H2. Area 2, on the right, contains routers R5 and R6, and host H3 and H4. The central area is the backbone.

- How does dividing the network into areas decrease the number of advertisements used?
- List the router-LSAs flooded in Area 1. Do the same for Area 2.
- List the information about the backbone and Area 2 that is flooded into Area 1.
- List the information about the backbone and Area 1 that is flooded into Area 2.

Problem 4

Chapter 5, problem 29.

Problem 5

If LSA's can be localized to a specific area, and the backbone only needs to know about a few advertisements (1 per group), then why doesn't BGP do this? What is the motivation for path-vector routing?