

# 2D1490: IP Routing in Simple Networks

August 28th, 2003

No books or notes are allowed.  
All answers must be well motivated.  
Unreadable answers will be given a zero grade.  
The questions are not sorted in order of difficulty.  
Total number of possible points: 40  
Preliminary score needed for a passing grade: 24.  
Good luck!

## 1. General

- (a) What is a routing protocol? (2p)
- (b) When are dynamic Routing Protocols necessary? (2p)
- (c) Describe Link State Protocols and Distance Vector Protocols. (5p)

## 2. RIP

- (a) What reasons are there to use RIP over some Link State Protocol, such as OSPF or ISIS? (3p)
- (b) What kinds of timers are there in RIP, and what role do they play? (4p)
- (c) Assuming that these timers did not exist-
  - i. What does Split Horizon do? What could happen if Split Horizon was not implemented in RIP? (4p)
  - ii. What problem does Split Horizon with Poisonous Reverse solve? Is there a special case which it does not solve? (2p)

### 3. OSPF

Imagine the topology described below:

The routing topology consists of two areas and three routers.

Area 0 has two routers in it- one ABR to Area 1, and one router which injects an external route into Area 0. These two routers in Area 0 are connected with a numbered point-to-point link.

Area 1 has two routers in it- one ABR to Area 0, and one router within the area. These two routers in Area 1 are connected with a numbered point-to-point link. Furthermore, the internal router in Area 1 is connected to a ip network with lots of hosts in it. None of the hosts talk OSPF.

Let us call the three routers ASBR, ABR and INTERNAL.

- (a) If Area 1 was a normal Area, what LSAs will the INTERNAL router have in its Link State Database?
- (b) If Area 1 was a Totally Stub Area, what LSAs will the INTERNAL router have in its Link State Database?
- (c) If Area 1 was a Stub Area, what LSAs will the ASBR have in its Link State Database?

In the above three cases, list all the LSAs, and try to describe their contents. (18p)