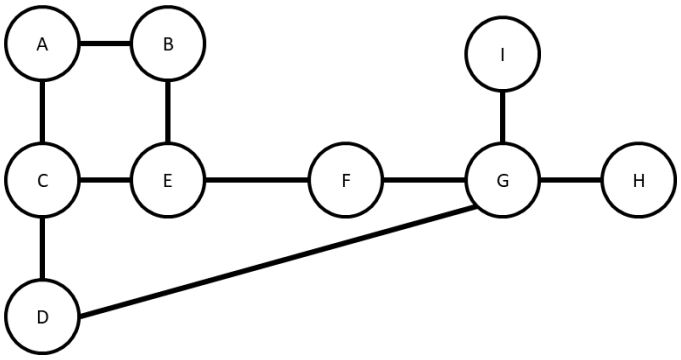
SE331: Introduction to Computer Networks	**Recitation 9**
Semester 1 5785	**8 Jan 2025**
Lecturer: Michael J. May	**Kinneret College**

RIP Steps and Protocol and Subnet Division Review

1 Routing Information Protocol Steps

Consider the RIP network shown below:



The network is initialized with the default RIP data and then the following events occur:

(1) C sends it distance vector to E

(2) E sends its distance vector to C.

(3) C and E process the received distance vectors.

(4) E sends its distance vector to F

(5) F sends it distance vector to E

(6) E and F process the received distance vectors.

(7) G sends its distance vector to F

(8) F sends it distance vector to G

(9) F and G process the received distance vectors.

Show the state of the routing tables for C, E, F, and G after the above events using the following table format. Show just the final routing table contents, there is no need to to show intermediate steps or the tables for the other nodes.

C's Table			E's Table			F's Table			G's Table		
Dest	Distance	Next Hop	Dest	Distance	Next Hop	Dest	Distance	Next Hop	Dest	Distance	Next Hop
A			A			A			A		
B			B			B			B		
C			C			C			C		
D			D			D			D		
E			E			E			E		
F			F			F			F		
G			G			G			G		
H			H			H			H		
I			I			I			I		

2 RIP v1 Trace

Open the RIP v1 trace found on Moodle with Wireshark. Use Wireshark and the RFC 1058 (`https://www.rfc-editor.org/rfc/rfc1058.html`) to answer the following questions.

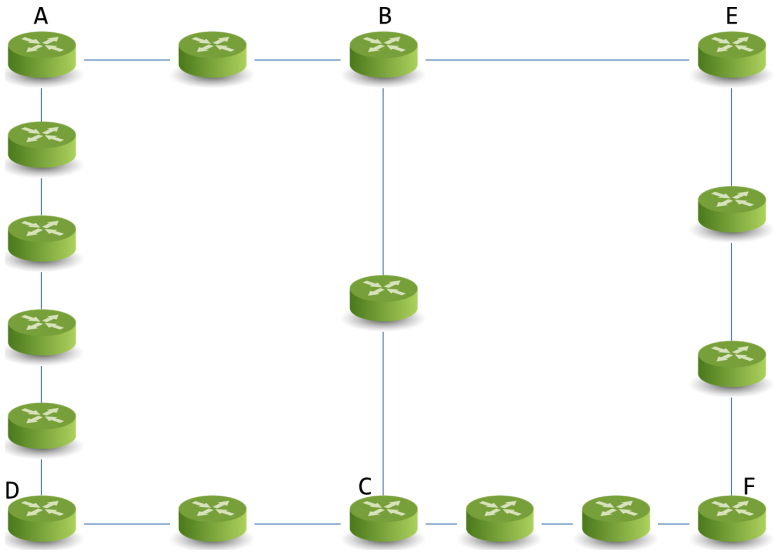
1. Find the first request packet (time 0). Who sends the request? Who is the recipient of the request? What is the request asking for? (look at 3.4.1 of RFC 1058).
2. Find the second request packet (time 20.37). Who sends the request? Who is the recipient of the request? What is the request asking for?
3. Find the response at time 20.422. Who sends the response? Who receives the response? What does the response information tell us?
4. What network is 10.0.0.1 connected to? How far away is 10.0.0.1 from it?
5. What network is 10.0.0.2 connected to? How far away is 10.0.0.2 from it?
6. Approximately how often does 10.0.0.1 send out routing updates?
7. Approximately how often does 10.0.0.2 send out routing updates?

3 RIP v2 Trace

Open the RIP v2 trace found on Moodle with Wireshark. Use Wireshark and the RFC 1723 (`https://www.rfc-editor.org/rfc/rfc1723.html`) to answer the following questions.

1. Find the message sent at time 29.924. Who sent the message? Who received the message?
2. There are two routes in the message sent at time 29.924. Where is the first route to? What is the next hop to reach the location? How far away is it? (See RFC 1058 section 3.2 for help).
3. Where is the second route to? What is the next hop to reach the location? How far away is it?
4. The subnet mask for the second route is 255.255.255.255. What does that tell you about the route advertised?
5. There are two routes advertised in the update sent at time 41.916. What is the destination advertised in the first route? How large is the subnet advertised?
6. What destination is advertised in the second route? How large is the subnet advertised?

4 Routing Information Protocol Steps



In the above network there are routers in a network that uses RIP for determining routing distances. For the purposes of this question, we will focus on just the six routers labeled in the picture (nodes A, B, C, D, E, F). The labeled routers begin with some initial information about specific other labeled nodes and then use RIP to exchange more information about other labeled nodes in the network. We will calculate routing tables for the named routers and treat them as if they are directly connected (*e.g.* A is a neighbor of B, D is a neighbor of C).

(a) Each node begins with limited information about a few other labeled nodes:

1. A: distances to B, D
2. B: distances to A, C, E
3. C: distances to B, D, F
4. D: distances to A, C
5. E: distances to B, F
6. F: distances to C, E

Write the routing tables for each of the labeled nodes based on this initial information using the format below.

(b) The following labeled nodes have exchanged routing information (via flooding):

1. A exchanged with B, D
2. B exchanged with A, C, E
3. C exchanged with B, D, F
4. D exchanged with A, C
5. E exchanged with B, F
6. F exchanged with C, E

(c) Step (b) happens a second time.

Use the following format for your answers:

Information Stored at Node	(Distance, Next Hop) to Reach Node A	B	C	D	E	F
A						
B						
C						
D						
E						
F						

5 Subnet Assignments

Consider a company with the following Class C network 100.100.100.X which it wishes to divide up among the following departments:

- Department A: 20 computers
- Department B: 60 computers
- Department C: 10 computers
- Department D: 12 computers
- Department E: 50 computers

Give a subnet division which is sufficient for the departments. Write your answer in the following format:

Name	Subnet #	Subnet Mask	Address Range
A	...	...	...
B	...	...	...
C	...	...	...
D	...	...	...
E	...	...	...

6 Subnet Assignments

Consider an organization with the class C subnet 193.225.178.X and the following subnetting requirements:

- Department A: 118 computers
- Department B: 59 computers
- Department C: 29 computers
- Department D: 12 computers
- Department E: 12 computers

Write down a correct and sufficient subnetting assignment for the organization. Use the following format for your answer:

Department	Subnet #	Mask	Address Range
A	...	...	...
B	...	...	...
C	...	...	...
D	...	...	...
E	...	...	...

