TLEN5370 - Homework 2

Homework 2

Instructions: Do each question in order and be prepared to discuss in class.

1) Explain how a RIP network can get into a routing loop and how the following address the problem.

a. Triggered Updates

- A network can get into a routing loop when there is a change in the network topology for example if a link were to fail on one of the routers.
- Address the problem: When a router detects a change, it will send a triggered update to inform them of the change. When this update happens, it will converge the network and prevent looping.

b. Split Horizon

- A loop can occur when a router advertises a route back to the same router it received the route from
- Address the problem: Split horizon prevents the act of advertising a route back to the same router.

c. Defining a Maximum

- A routing loop can happen if there is no limit on the number of hops a route can traverse.
- Address the problem: A hop count is implemented in RIP that limits the number of hops to determine the best route.

2) Given the following topology is running RIP. Show the routing table for router 2:
- steady state

4.68.1.0	Se1	0
63.208.5.0	Se1	1
4.68.1.12	Se3	0
29.24.12.0	Se3	1
4.68.1.4	Se1	1
77.6.1.128	Se1	2
4.68.1.8	Se2	0
4.68.1.24	Se2	1

38.24.15.0	Se2	1
4.68.1.16	Se2	1
4.68.1.20	Se3	1
20.1.4.0	Se3	2

- after network 4.68.1.12/30 fails

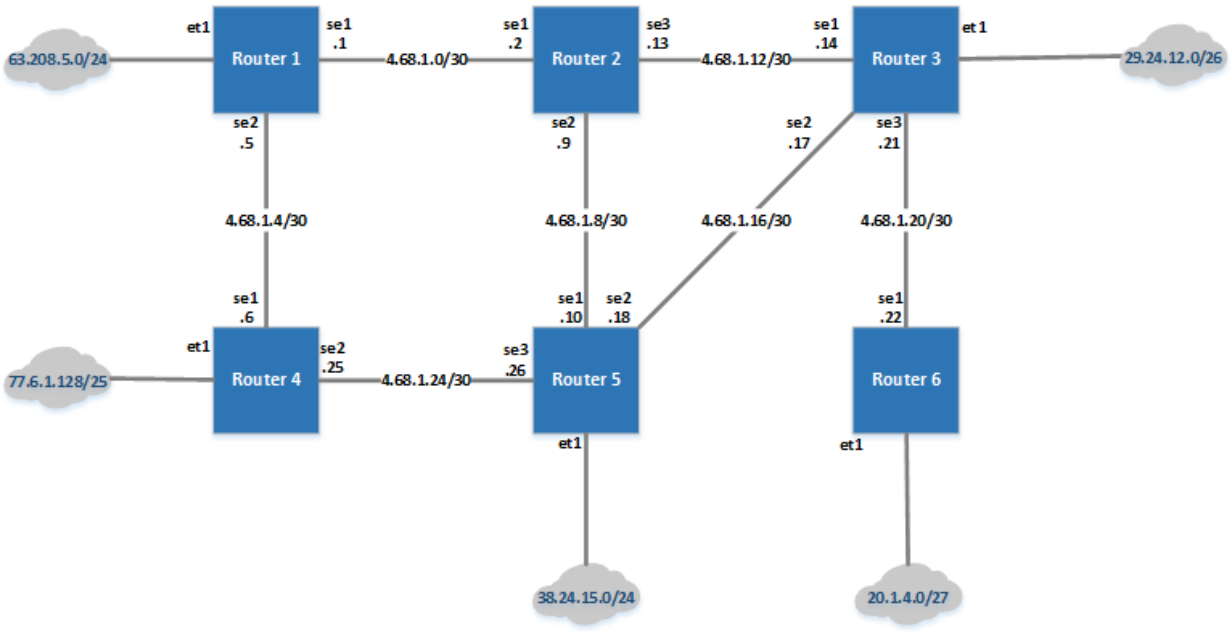
4.68.1.0	Se1	0
63.208.5.0	Se1	1
29.24.12.0	Se2	2
4.68.1.4	Se1	1
77.6.1.128	Se1	2
4.68.1.8	Se2	0
4.68.1.24	Se2	1
38.24.15.0	Se2	1
4.68.1.16	Se2	1
4.68.1.20	Se2	2
20.1.4.0	Se2	3

- after network 4.68.1.24/30 also fails

4.68.1.0	Se1	0
63.208.5.0	Se1	1
29.24.12.0	Se2	2
4.68.1.4	Se1	1
77.6.1.128	Se1	2
4.68.1.8	Se2	0
38.24.15.0	Se2	1
4.68.1.16	Se2	1
4.68.1.20	Se2	2
20.1.4.0	Se2	3

- after router 1 also fails

29.24.12.0	Se2	2
4.68.1.8	Se2	0
38.24.15.0	Se2	1
4.68.1.16	Se2	1
4.68.1.20	Se2	2
20.1.4.0	Se2	3



3) Explain what events may cause triggered updates not work to prevent routing loops.

- With some networks, partitioning of the network could prevent route updates and could create loops.
- Simply misconfiguring RIP can cause looping if it is not set up correctly. For example, maybe there are static routes set that are unknown to the engineer which creates a loop, or RIP is not enabled.
- If there are multiple link failures at one time, the updates cannot keep up and will cause temporary loops.

4) What are the differences between RIPv1 and RIPv2?

RIPv1:

- Metric: hop count
- Updates every 30s
- Convergence 3-5 min.
- Classful
- Broadcasts updates

RIPv2:

- Same features as v1
- VLSM support
- Plain text and MD5 authentication
- Includes next hop router IP on updates
- Multicast routing updates

Source: IP Routing Protocols L02.pptx

5) Explain the concept and need for Administrative Distance/Preference.

The concept of Administrative Distance is a preset metric within a router that determines which protocol to accept when receiving packets. The lower the number, the better. For example, OSPF has a metric of 110, while RIP has a metric of 120, so if packets were sent to a source, it would choose the OSPF routed packets over the RIP packets.