INR Lab Assignment
OSPFv3

C. Dumitru   Jeroen van der Ham   Mick Pouw   Arno Bakker
(Arno.Bakker@os3.nl)

Feedback deadline:
December 8 2017 10:00 CET

Abstract

This week we will be looking at OSPF, or Open Shortest Path First. We will analyze the traffic generated by the OSPF daemon. As with the assignment about RIP, we will be using Quagga.
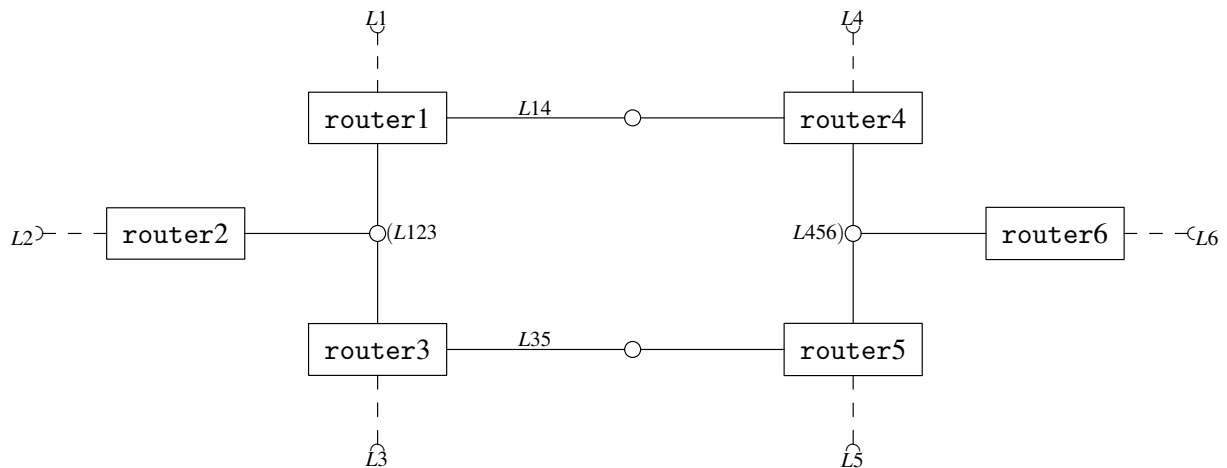
Figure 1: OSPF network 1

Preparation

Task 1. Create the config file required to start the network depicted in Figure 1.

You will use the IPv6 blocks defined below. Combine this with the X and Y value from the previous labs. The addressing is as follows:

- For L1 : The $2001 : 0db8 : 0Y0X : 0001 :: /64$ block

- For L2 : The $2001 : 0db8 : 0Y0X : 0002 :: /64$ block

- For L3 : The $2001 : 0db8 : 0Y0X : 0003 :: /64$ block

- For L4 : The $2001 : 0db8 : 0Y0X : 0004 :: $ /64 block

- For L5 : The $2001 : 0db8 : 0Y0X : 0005 :: $ /64 block

- For L6 : The $2001 : 0db8 : 0Y0X : 0006 :: $ /64 block

- For L14 : The 10th /64 block

- For L35 : The 19th /64 block

- For L456 : The 34nd /64 block

- For L123 : The 42nd /64 block

As a convention, each $router_i$ will use the $:: i$ address on the network segment. (e.g., assuming that the IP block for L235 is `2001:db8::/64`, **router5** will use `2001:db8::5`).

Task 2. Draw a diagram of the network that shows the IP addressing for each router interface.

Task 3. Configure OSPF on each router in such a way that the network is stable and operational (any point is reachable from any point). All routers are in the same area.

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Task 4. For **router5** display the following:

- the router ID

- the routing table

- the OSPF routing table

- the OSPF interface table

- the OSPF neighbors

Are there any differences between the OSPF table and the routing table? (*Hints: telnet, ip, show*) Why?

Task 5. Identify the DR and BDR roles in one network segment, as follows: Pick a network segment with both a DR and a BDR and explain how this was established. Shutdown the DR's interface that connects to that segment. Explain what happens, and what are the new roles.

Task 6. Perform and **explain** all configurations required such that all traffic from **router1** to **router6** goes always via **router3**. *Do not shutdown OSPF processes or interfaces ...*

Task 7. Configure **router2** such that it behaves as a default gateway for all the other routers.

Areas

Consider Figure 1. Place the routers in the following OSPF areas:

- Area0: **router1**, **router4**

- Area1: **router1**, **router2**, **router3**

- Area2: **router4**, **router5 router6**

Task 8. Configure OSPF on each router in such a way that the network is stable and operational (any point is reachable from any point)

Task 9. From **router3** perform a traceroute to L5. Explain the output.

Optional

Task 10. Pick any network segment that has 3 routers. Identify all the types of network packets that are sent from network startup to convergence. Identify all the OSPF router roles. Upload the raw dump file (as generated by the sniffer) to your wiki, and provide a link in your log. Only mention the relevant packets.

Task 11. Configure OSPFv2 and assign IPv4 address to the interfaces on each router in such a way that the network is stable and operational (any point is reachable from any point). All routers are in the same area. Explain the configuration in your log.