Experiment 1b - Setup an IGP (OSPFv3/OSPF6 for IPv6)

DE-CIX Academy

Version 1.2

1 Purpose

OSPFv2 only deals with IPv4 interface addresses. To distribute IPv6 addresses, you need OSPFv3. In FRRouting OSPFv3 is named “OSPF6”.

2 Network Setup

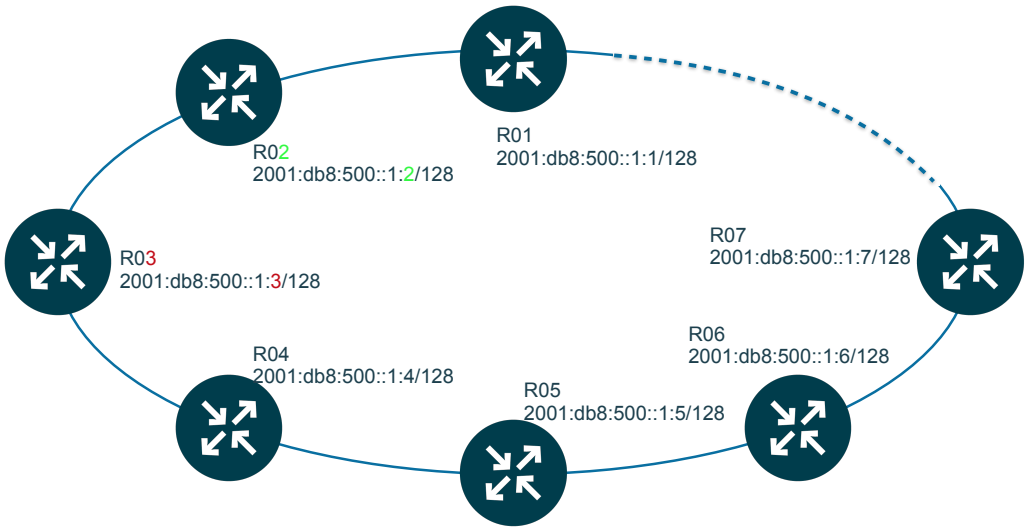


Figure 1: Network Setup

Figure 1 shows the network topology for this experiment. All devices are connected in a ring like structure, each device has two neighbors.

3 Slides

Setup OSPFv3

- OSPFv3 runs on interfaces
- It still has the *area* concept - be aware that areas can look like IPv4 addresses but they are not.

```
configure

router ospf6

interface loopback0
  ipv6 ospf6 area 0

interface eth0
  ipv6 ospf6 area 0

interface eth1
  ipv6 ospf6 area 0
```

Show commands:

- show ipv6 route connected
- show ipv6 route ospf6
- show ipv6 ospf6
- show ipv6 ospf6 interface
- show ipv6 ospf6 neighbor
- show running
- show ipv6 route

4 Your Device

Please now connect to your device and check your IPv6 adresses. Fill out the following table. The commands you need are *show running* and *show interface*:

	Router Name	**Interface Name**	**IP Address**
Loopback:		*loopback0*	
Interface to the left:			
Interface to the right:			

5 Setup OSPF6

5.1 To set up OSPF6 you need to:

- Start the OSPF6 process
- Configure your router-id (an IPv4 address for whatever reason, use your IPv4 loopback address for this)
- Add *interfaces* where OSPF6 should run on to the process

5.2 The commands you need are:

show ipv6 route ospf6 shows you all prefixes routed within OSPF6

show ipv6 ospf6 gives you information about the OSPF6 process

show ipv6 ospf6 interface shows details about each interface where OSPF6 is running

show ipv6 ospf6 neighbor shows disovered neighbor routers which run OSPF6

5.3 To configure OSPF6 in config mode you need:

router-id <a.b.c.d> configures your router-id. Use your loopback IPv4 address for this. This is a global command in FRRouting (configure it *outside* of the OSPF6 router context).

router ospf6 starts the OSPF6 process

ipv6 ospf6 area 0 in interface-context enables OSPF6 on the given interface with area *0* (area 0 is the backbone area). You need this statement in each interface you want to run OSPF6 on including the dummy/loopback interface.

5.4 Tasks:

- Enable OSPF6 on the right, left, and dummy interface
- Check the routing table after all routers have OSPF6 enabled. For this, do a *show ipv6 route ospf6* and take note which loopback addresses are routed through your left and which through your right interface
- Do a *ping* to some of the other loopback addresses.
- Do a *traceroute* to the other loopback addresses and take note which way the packets go
- Shut down one of your interfaces (command *shutdown* in interface context in config mode), do the same traceroutes again. Has anything changed?
- Unshut (command: *no shutdown*) the same interface and try again.
- Do all a *show ipv6 route ospf6*, the one of the participants shuts down one interface. Do all the *show ipv6 route ospf6* again and note what has changed.

6 Solution

6.1 Solution for FRRouting

```
  router ospf6

  interface loopback0
    ipv6 ospf6 area 0

  interface eth0
    ipv6 ospf6 area 0

  interface eth1
    ipv6 ospf6 area 0
```

6.2 Solution for Juniper

```
protocols {
  ospf3 {
        area 0.0.0.0 {
            interface lo0.0;
            interface em0.0;
            interface em1.0;
        }
    }
}
```

6.3 Solution for Mikrotik

```
/routing ospf-v3 interface
add area=backbone interface=loopback0
add area=backbone interface=ether1
add area=backbone interface=ether2
```