

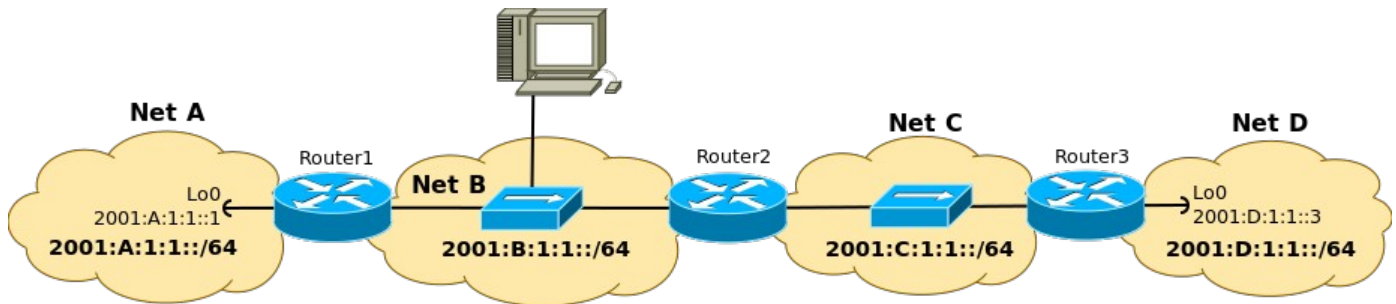
ARQUITETURA E GESTÃO DE REDES

LABORATORY GUIDE

Objectives

- IPv6 internal routing: RIPng and OSPFv3

RIPng



1. Configure the network illustrated in the above figure. Activate IPv6 routing with the command `ipv6 unicast-routing`. Activate the protocol RIPng (process number 1) in all interfaces:

```
Router1(config)# interface <if-name>
Router1(config-if)# ipv6 rip 1 enable
```

Verify also the RIPng information in routers:

```
show ipv6 rip 1
show ipv6 rip 1 database
show ipv6 rip 1 next-hops
```

Verify the routing tables and retest the connectivity between the equipments.

2. Restart a capture on PC's Ethernet interface. Wait for 1 minute and disconnect the link between Router1 and network A. Analyze the RIPng packets being captured. Wait for 1 minute and reconnect the link between Router1 and network A. Analyze the captured RIPng packets.

3. Restart a capture on PC's Ethernet interface in promiscuous mode. In Router2 perform a filtering of RIPng Routing Updates in order to prevent the announcement of network 2001:C:1:1::/64

```
Router2(config)# ipv6 prefix-list <pl-name> seq 2 deny 2001:C:1:1::/64
Router2(config)# ipv6 prefix-list <pl-name> seq 4 permit 2001:D:1:1::/64
Router2(config)# ipv6 router rip 1 !The process identifier can be any string
Router2(config-rtr)# distribute-list prefix-list <pl-name> out <interface>
```

Note: <pl-name> can be any string, and will identify the prefix-list.

Note 2: seq n defines the order of the filtering rules.

Verify the prefix-lists configured:

```
Router2# sh ipv6 prefix-list
```

Re-verify the routing tables/databases and analyze the captured RIPng packets.

4. Configure Router2's interface to network B to announce (to be) the default route by RIPng:

```
Router2(config)# interface <if-name>
Router2(config-if)# ipv6 rip 1 default-information originate
```

Re-verify the routing tables/databases and analyze the captured RIPng packets.

Redo with a different default metric value:

```
Router2(config-if)# ipv6 rip 1 default-information originate metric 10
```

Re-verify the routing tables/databases and analyze the captured RIPng packets.

OSPFv3

5. Deactivate the protocol RIPv6 and activate OSPFv3 (process number 1) in all interfaces (consider a single area - Area0):

```
Router1(config)#ipv6 router ospf 1          !The process identifier can be any string
Router1(config-rtr)# router-id <n.n.n.n>    !Manually define OSPFv3 RID
Router1(config)# interface <if-name>
Router1(config-if)# ipv6 ospf 1 area 0
```

On the loopback interfaces, defined them as a point-to-point network (to force the announcement of the loopback mask) with the command:

```
Router1(config)# interface loopback 0
Router1(config-if)# ipv6 ospf network point-to-point
```

Verify and analyze the OSPFv3 database information in routers:

```
show ipv6 ospf 1
show ipv6 ospf 1 database
show ipv6 ospf 1 database network
show ipv6 ospf 1 database router
show ipv6 ospf 1 database prefix          !New OSPFv3 database
```

Re-verify the routing tables and retest the connectivity between the equipments.

6. Restart a capture on PC's Ethernet interface in promiscuous mode. Wait for 1 minute and shutdown the loopback0 interface on Router1 (network A). Analyze the OSPFv3 packets being captured. Wait for 1 minute and reactivate (no shutdown) the loopback interface on Router1 (network A). Analyze the captured OSPFv3 packets.