

POLITECNICO DI TORINO

PROTOCOLLI E ARCHITETTURE DI ROUTING

Capture and analysis of OSPF packets (single area)

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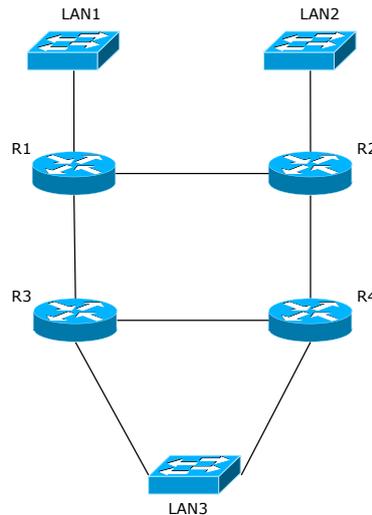
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Introduction

Given the router network pictured below, configure the devices with IPv4 addressing rules using the **192.168.4.0/22** address block.

Configure the network to use the OSPF protocol with a **single-area**, then verify that routes are correctly propagated and that all the destinations can be reached (e.g., using PING sessions). All route announcements should be handled by OSPF: **do not use static routes**.

Be careful to configure the point-to-point Ethernet links between routers in **point-to-point** mode, using the `ip ospf network point-to-point` command on the proper Ethernet interfaces.



Lab questions

1. Provide an image of the **addressing plan** used in the network, including the addresses of all the router interfaces and IP networks. List also the *loopback* addresses, if any, assigned to the routers.

Please reserve properly sized address ranges for each LAN.

2. **Succinctly** list the **relevant** fields of the most important OSPF messages traveling through the network in steady state, without failures.

3. Provide the OSPF database as shown, in steady state, on a router of your choice, by using:

```
# show ip ospf database
```

with a brief description of each field and record.

4. Ensure that R3 is the *Designated Router* on the LAN3, editing the network configurations if necessary. As soon as the network reaches the steady state, set the capture on the link between R1 and R3 and put in *shutdown* the interface of R3 towards LAN3. Describe the OSPF messages traveling to the network after the simulated failure, listing:
 - the most important fields included in each packet;
 - their relationship with the failure.

5. Repeat the previous simulation, by editing the network configuration to ensure that R4 is now the *Designated Router* on the LAN3. Keep the other parameters unchanged.

This time, capture the traffic on links R1 – R3 and R1 – R2.

Considering only the traffic on link R1 – R3, what are the differences w.r.t. the capture done when R3 was the Designated Router? Why?

6. Compare the captures on links on links R1 – R3 and R1 – R2; briefly explain which packets are different, how and why.