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Lab 7. Basic OSPF Configuration

Xarxes i protocols

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# Task 1. Basic Router Configurations

## 1. Configure the router hostname

We have changed Router1’s hostname via CLI typing “hostname R1”.

The same has been done for Router2 with “hostname R2” and for Router3 with “hostname R3”.

## 2. Disable DNS lookup

To disable DNS lookup, we have done “no ip domain-lookup” in each router’s configuration terminal.

# Task 2. Configure addresses

## Step 1: Configure interfaces on R1, R2, and R3

We have added the interfaces in the addressing table for each router.

R1: one FastEthernet and two Serial.

R2: one FastEthernet and two Serial.

R3: one FastEthernet and two Serial.

## Step 2: Verify IP addressing and interfaces

Interfaz de usuario gráfica, Texto

Descripción generada automáticamente con confianza media

Interfaz de usuario gráfica

Descripción generada automáticamente con confianza media

Interfaz de usuario gráfica, Texto

Descripción generada automáticamente

## Step 3: Configure Ethernet interfaces of PC1, PC2, and PC3

We have added the IP and subnet masks for each interface of each router as they are assigned in the addressing table under the topology.

## Step 4: Test the PC Configuration by pinging the default gateway from the PC

Interfaz de usuario gráfica

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Interfaz de usuario gráfica

Descripción generada automáticamente

Interfaz de usuario gráfica, Texto

Descripción generada automáticamente

# Task 3: Configure OSPF on the R1 Router

## Step 1: Use the router ospf command in global configuration mode to enable OSPF on the R1 router



## Step 2: Configure the network statement for the LAN network.



## Step 3: Configure the router to advertise the 192.168.10.0/30 network attached to the Serial0/0/0 interface



## Step 4: Configure the router to advertise the 192.168.10.4/30 network attached to the Serial 0/0/1 interface



# Task 4: Configure OSPF on the R2 and R3 Routers

## Step 1: Configure OSPF on the R2 Router

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## Step 2: Configure OSPF on the R3 Router

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# Task 5: Configure OSPF Router IDs

## Step 1: Examine the current router IDs in the topology

**What is the router of ID for R1?** 192.168.10.5

**What is the router of ID for R2?** 192.168.10.9

**What is the router of ID for R3?** 192.168.10.10

## Step 2: Use loopback addresses to change the router IDs of the routers in the topology

Texto

Descripción generada automáticamente

Interfaz de usuario gráfica, Texto

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Texto

Descripción generada automáticamente

## Step 3: Reload the routers to force the new Router IDs to be used

**R1**:

Texto

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**R2**:

Texto

Descripción generada automáticamente

**R3**:

Texto

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**When the router is reloaded, what is the router ID for R1?** 10.1.1.1

**When the router is reloaded, what is the router ID for R2?** 10.2.2.2

**When the router is reloaded, what is the router ID for R3?** 10.3.3.3

## Step 4: Use the “show ip ospf neighbors” command to verify that the router IDs have changed

Texto, Carta

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Texto

Descripción generada automáticamente

Texto

Descripción generada automáticamente

**What information does show ip protocols give us?**

Imagen que contiene Texto

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Imagen que contiene Tabla

Descripción generada automáticamente

Imagen que contiene Calendario

Descripción generada automáticamente

# Task 6: Examine OSPF Routes in the Routing Tables

**Explain the Routing tables. How have the costs been obtained?**

Texto, Carta

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Texto, Carta

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Texto

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We have used the command “show ip ospf interface brief” to get the costs of each OSPF route on each router.

**R1**:

* Fa0/0 cost: 1
* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

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**R2**:

* Fa0/0 cost: 1
* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

Descripción generada automáticamente

**R3**:

* Fa0/0 cost: 1
* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

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# Task 7: Redistribute an OSPF Default Route

## Step 1: Configure a loopback address on the R1 router to simulate a link to an ISP

Texto, Carta

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## Step 2: Configure a static default route on the R1 router

Texto, Carta

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## Step 3: Use the default-information originate command to include the static route in the OSPF updates that are sent from the R1 router

Texto, Carta

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## Step 4: View the routing table on the R2 router to verify that the static default route is being redistributed via OSPF

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**Can you change the cost?**

Yes, the cost can be changed via router’s CLI with the command “ip ospf cost <value>”.

**Change the bandwidth of the interfaces that connect R1 and R2**

We have changed the bandwidth of Serial3/0 of R1 to 1500 and so the cost is now 66 instead of 64 as it used to be.

Texto, Carta

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# Task 8: Document the Router Configurations

## Most important parameters of the running configuration

We would be considering important parameters on each router its Router ID, Interfaces and OSPF Costs:

* R1
  + ID: 10.1.1.1
  + Interfaces:
    - FastEthernet0/0 – 172.16.1.17
    - Serial2/0 – 192.168.10.5
    - Serial3/0 – 192.168.10.1
    - Loopback0 – 10.1.1.1
    - Loopback1 – 172.30.1.1
  + OSPF Costs:
    - FastEthernet0/0 – 1
    - Serial2/0 – 64
    - Serial3/0 – 66
* R2
  + ID: 10.2.2.2
  + Interfaces:
    - FastEthernet0/0 – 10.10.10.1
    - Serial2/0 – 192.168.10.9
    - Serial3/0 – 192.168.10.2
    - Loopback0 – 10.2.2.2
  + OSPF Costs:
    - FastEthernet0/0 – 1
    - Serial2/0 – 64
    - Serial3/0 – 64
* R3
  + ID: 10.3.3.3
  + Interfaces:
    - FastEthernet0/0 – 172.16.1.33
    - Serial2/0 – 192.168.10.6
    - Serial3/0 – 192.168.10.10
    - Loopback0 – 10.3.3.3
  + OSPF Costs:
    - FastEthernet0/0 – 1
    - Serial2/0 – 64
    - Serial3/0 – 64

## Routing tables

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Descripción generada automáticamente

Texto, Carta

Descripción generada automáticamente

## Multicast addresses used in OSPF

Depending on the device we want to multicast to we have two different multicast addresses, if it is an OSPF router the multicast address will be 255.0.0.5 and if it is a DR/BDR address, the multicast address will be 244.0.0.6.

Taking as an example R1, the multicast address of the Fa0/0 interface would be 244.0.0.6 and for the other two serial links, the multicast address would be 255.0.0.5.

Texto

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## Cost of the serial links in the diagram topology

**R1**:

* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

Descripción generada automáticamente

**R2**:

* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

Descripción generada automáticamente

**R3**:

* Se2/0 cost: 64
* Se3/0 cost: 64

Texto

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