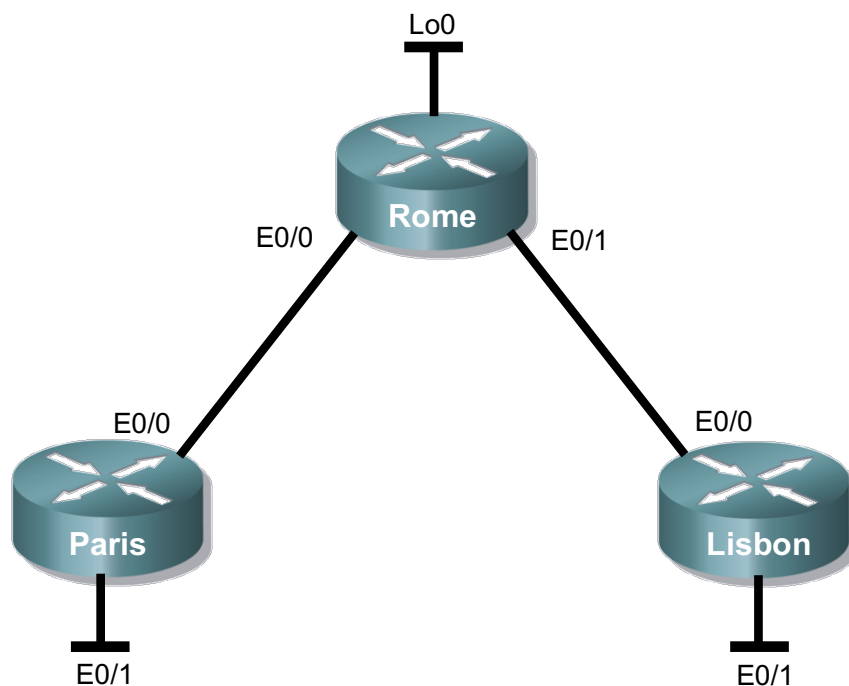


## Lab – Configuring IPv4 Static and Default Routes

### Topology



### Addressing Table

Device	Interface	IP Address	Subnet Mask
Paris	E0/0	192.168.12.1	255.255.255.0
	E0/1	192.168.1.1	255.255.255.0
Rome	E0/0	192.168.12.2	255.255.255.0
	E0/1	192.168.23.2	255.255.255.0
	Lo0	192.168.2.2	255.255.255.0
Lisbon	E0/0	192.168.23.3	255.255.255.0
	E0/1	192.168.3.3	255.255.255.0

### Objectives

**Part 1: Login to Devices**

**Part 2: Configure Basic Device Settings and Verify Connectivity**

**Part 3: Configure Static Routes**

**Part 4: Configure and Verify a Default Route**

### Background / Scenario

A router uses a routing table to determine where to send packets. The routing table contains a set of routes that describe which gateway or interface the router uses to reach a specified network. Initially, the routing table contains only directly connected networks. To communicate with distant networks, routes must be specified and added to the routing table.

In this lab, you will manually configure a static route to a specified distant network based on a next-hop IP address. You will also configure a static default route. A default route is a type of static route that specifies a gateway to use when the routing table does not contain a path for the destination network.

**Note:** This lab provides minimal assistance with the actual commands necessary to configure static routing.

### Required Resources

- 3 Routers (Cisco 4321 with Cisco IOS Release 15.2(4)M3 universal image or comparable)

### Part 1: Login to Devices

**Step 1: Login to the 3 routers assigned to you by your instructor.**

- a. Use a terminal emulation program (e.g. Putty) to login to the router assigned to you by your instructor.

### Part 2: Configure Basic Device Settings and Verify Connectivity

In Part 2, you will configure basic settings, such as the interface IP addresses, device access, and banners. You will verify LAN connectivity and identify routes listed in the routing tables for the routers.

**Step 1: Configure basic settings on Paris, Rome and Lisbon.**

- a. Configure device names, as shown in the Topology and Addressing Table.
- b. Disable DNS lookup.
- c. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

**Step 2: Create a Loopback interface on Rome.**

- a. Create a Loopback interface on Rome, as shown in the Topology and Addressing Table.

**Step 3: Configure IP settings on the routers.**

- a. Configure the Paris, Rome and Lisbon interfaces with IP addresses according to the Addressing Table.

**Step 4: Verify connectivity between the routers.**

- a. Test connectivity by pinging directly connected devices.  
From Paris, is it possible to ping Rome E0/0 interface? \_\_\_\_\_  
From Rome, is it possible to ping Lisbon E0/0 interface? \_\_\_\_\_

From Lisbon, is it possible to ping Rome E0/1 interface? \_\_\_\_\_

If the answer is **no** to any of these questions, troubleshoot the configurations and correct the error.

- b. Test connectivity between devices that are not directly connected.

From Paris, is it possible to ping Rome E0/1 interface? \_\_\_\_\_

From Paris, is it possible to ping Lisbon E0/1 interface? \_\_\_\_\_

From Lisbon, is it possible to ping Rome Lo0 interface? \_\_\_\_\_

Were these pings successful? Why or why not?

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### Step 5: Gather information.

- a. Check the status of the interfaces on Rome with the **show ip interface brief** command.

How many interfaces are activated on Rome? \_\_\_\_\_

- b. Check the status of the interfaces on Lisbon.

How many interfaces are activated on Lisbon? \_\_\_\_\_

- c. View the routing table information for Rome using the **show ip route** command.

What networks are present in the Addressing Table of this lab, but not in the routing table for Rome?

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- d. View the routing table information for Lisbon.

What networks are present in the Addressing Table in this lab, but not in the routing table for Lisbon?

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Why are all the networks not in the routing tables for each of the routers?

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## Part 3: Configure Static Routes

In Part 3, you will implement static and default routes, you will confirm that the routes have been added to the routing tables of the routers, and you will verify connectivity based on the introduced routes.

### Step 1: Configure static routes on Paris.

With a recursive static route, the next-hop IP address is specified. Because only the next-hop IP is specified, the router must perform multiple lookups in the routing table before forwarding packets. To configure recursive static routes, use the following syntax:

```
Router(config)# ip route network-address subnet-mask ip-address
```

- a. On Paris router, configure a static route to the 192.168.3.0 network using the IP address of the E0/0 interface of Rome as the next-hop address. Write the command you used in the space provided.

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- b. View the routing table to verify the new static route entry.

How is this new route listed in the routing table?

From Paris, is it possible to ping Lisbon? \_\_\_\_\_

These pings should fail. Why? \_\_\_\_\_

- c. On Paris router, configure static routes to the 192.168.2.0 network and the 192.168.23.0 network using the IP address of the E0/0 interface of Rome as the next-hop address. Write the command you used in the space provided.

\_\_\_\_\_  
\_\_\_\_\_

- d. View the routing table to verify the new static route entries.

How are these new routes listed in the routing table?

\_\_\_\_\_

### Step 2: Configure static routes on Rome.

- a. On the Rome router, configure a static route to the 192.168.1.0 network using the static route configuration from the previous steps. Write the command you used in the space provided.

\_\_\_\_\_

- b. On the Rome router, configure a static route to the 192.168.3.0 network using the static route configuration from the previous steps. Write the command you used in the space provided.

\_\_\_\_\_

- c. View the routing table to verify the new static route entry.

- d. From Paris, is it possible to ping the Rome address 192.168.2.2? \_\_\_\_\_

This ping should be successful.

## Part 4: Configure and Verify a Default Route

In Part 4, you will implement a default route, confirm that the route has been added to the routing table, and verify connectivity based on the introduced route.

A default route identifies the gateway to which the router sends all IP packets for which it does not have a learned or static route. A default static route is a static route with 0.0.0.0 as the destination IP address and subnet mask. This is commonly referred to as a “quad zero” route.

In a default route, either the next-hop IP address or exit interface can be specified. To configure a default static route, use the following syntax:

```
Router(config)# ip route 0.0.0.0 0.0.0.0 {ip-address or exit-intf}
```

- a. Configure Lisbon router with a default route using the IP address of the E0/1 interface of Rome as the next-hop address. Write the command you used in the space provided.

\_\_\_\_\_

- b. View the routing table to verify the new static route entry.

How is this new route listed in the routing table?

\_\_\_\_\_

What is the Gateway of last resort?

\_\_\_\_\_

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- c. From Lisbon, is it possible to ping the 192.168.1.1? \_\_\_\_\_
- d. From Lisbon, is it possible to ping the 192.168.2.2? \_\_\_\_\_

These pings should be successful.

**Ask the instructor to reload the devices before continuing to the next lab exercise.**

### Reflection

1. Assuming a new network 192.168.10.0/24 is connected to interface E0/2 on Paris. What commands could be used to configure a static route to that network from Rome?

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2. Why is it important to configure a default route on a router?

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