Lab 6.1.2 Creating a Network Diagram from Routing Tables

Objectives

- Interpret router outputs.
- Identify networks and IP addresses for each router.
- Draw a diagram of the network topology.
- Reflect upon and document the network implementation.

Background / Preparation

In this lab you will create a network topology diagram based only on the output of the **show ip route** command from two routers. The **show ip route** command displays the current state of the routing table. Routers R1 and R2 are directly connected over a WAN link and both are running the RIP dynamic routing protocol. In addition to the WAN link, each of the routers is connected to its own local networks.

Step 1: Examine the routing table entries for the router R1

a. Examine the **show ip route** output from router R1 shown below.

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/1
R    192.168.3.0/24 [120/1] via 172.17.0.2, 00:00:17, Serial0/0
R    192.168.4.0/24 [120/1] via 172.17.0.2, 00:00:17, Serial0/0
```

b. How many networks does router R1 know about? _____

c. How many networks are directly connected to this router? _____

d. How many networks have been learned from another router? _____

e. Using the codes at the beginning of the show ip route output, what does the "R" mean?
    _____

f. In the routes learned via RIP, to which device does the IP address 172.17.0.2 belong? _____

g. In the routes learned via RIP, to which device is Serial0/0 referring and what does it mean?
    _____

Step 2: Examine the routing table entries for router R2

a. Examine the **show ip route** output from router R2 shown below..

```
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0/0
R    192.168.1.0/24 [120/1] via 172.17.0.1, 00:00:17, Serial0/0
R    192.168.2.0/24 [120/1] via 172.17.0.1, 00:00:17, Serial0/0
C    192.168.3.0/24 is directly connected, FastEthernet0/0
C    192.168.4.0/24 is directly connected, FastEthernet0/1
```

b. How many networks does router R2 know about? _____

c. How many networks are directly connected to this router? _____

d. How many networks have been learned from another router? _____

e. In the routes learned via RIP, to which device does the IP address 172.17.0.1 belong? _____

f. In the routes learned via RIP, to which device is Serial0/0 referring and what does it mean?

_____

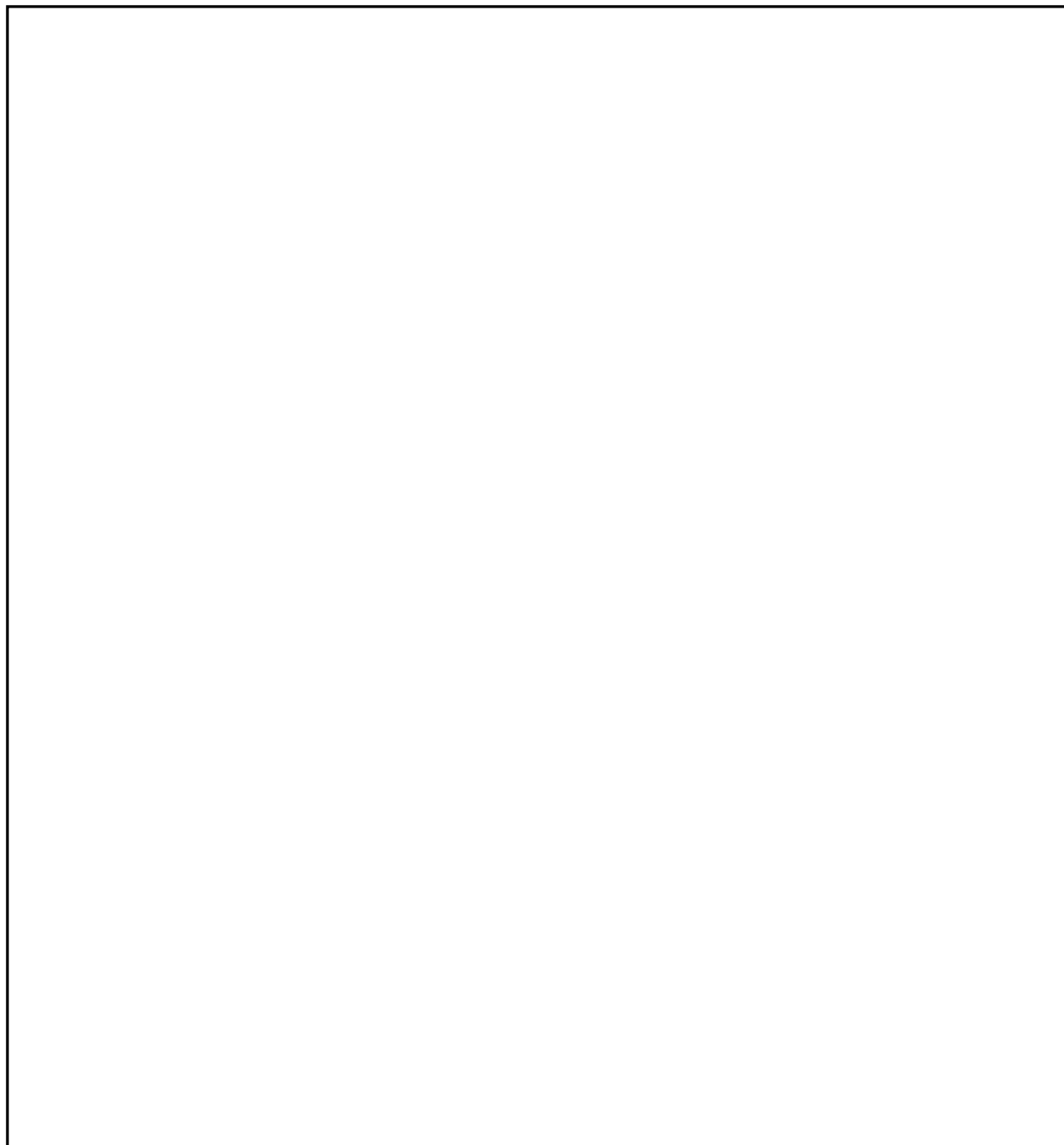**Step 3: Document router interfaces and IP addresses**

    a. Based on the **show ip route** output from routers R1 and R2, fill in the table with the router name, the names of all interfaces in use, and their IP addresses and subnet masks. Use the first available IP address for each of the local network FastEthernet interfaces.

Device Name	Interface	IP Address	Subnet Mask (Dotted decimal and /xx)
R1			
R1			
R1			
R2			
R2			
R2			

    b. In this example, can the exact IP address of all router interfaces be determined by looking at the routing tables? _____

    c. Which router interface IP addresses can be determined from the routing tables?
_____

Step 4: Create a network topology diagram

Based on the **show ip route** output from routers R1 and R2, and the information you entered in the table, draw the network topology here. Be sure to include all devices, connections, interfaces, IP addresses, subnet masks, and network numbers.

Step 5: Reflection

    a.   What do you think would happen to the entries in the routing table on R1 if one of the Ethernet networks on R2 was disconnected?

          _____

          _____

    b.   What do you think would happen to the entries in the routing tables on R1 and R2 if the Serial interface on R2 was shut down?

          _____

          _____