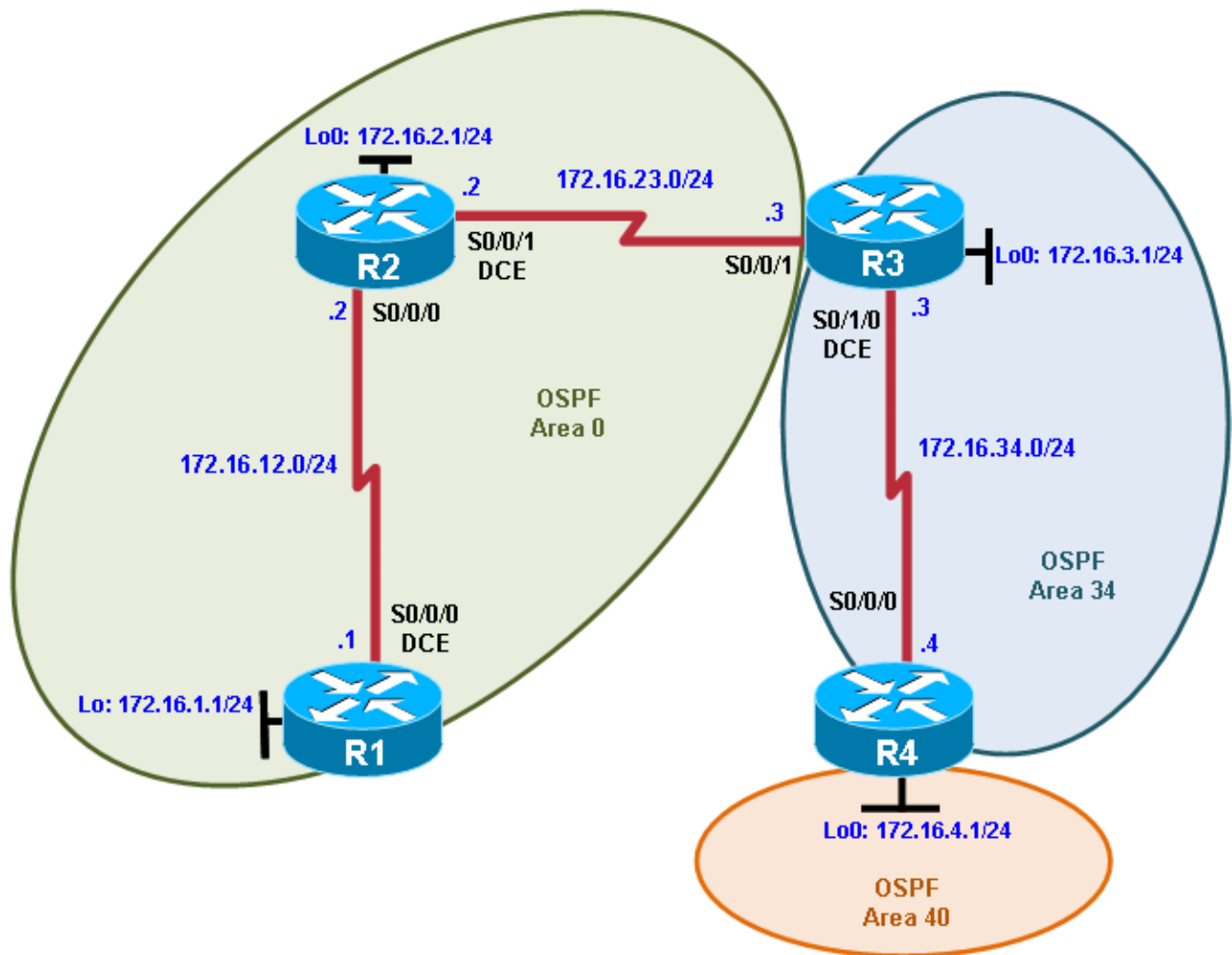


Chapter 3 Lab 3-6, OSPF Troubleshooting Lab

Topology



Objectives

- Troubleshoot OSPF operation and configuration.

Background

In this lab, you troubleshoot existing configurations to get a working topology. Some of these configurations are correct, and some are intentionally wrong. Your goal is to use troubleshooting techniques to fix anything in the scenario that prevents full IP connectivity. Full IP connectivity means every address in the scenario should be reachable from every router. If you do not know where to start, try pinging remote addresses and see which ones are reachable (either manually performing pings or using a Tcl script).

Note: This lab uses Cisco 1841 routers with Cisco IOS Release 12.4(24)T1 and the Advanced IP Services image c1841-advipservicesk9-mz.124-24.T1.bin. You can use other routers (such as a 2801 or 2811) and Cisco IOS Software versions if they have comparable capabilities and features. Depending on the router model and Cisco IOS Software version, the commands available and output produced might vary from what is shown in this lab.

Required Resources

- 4 routers (Cisco 1841 with Cisco IOS Release 12.4(24)T1 Advanced IP Services or comparable)
- Serial and console cables

Requirements

- Cut and paste the initial configurations from this lab into the respective routers.
- Use the IP addressing scheme shown in the diagram.
- All routers must participate in OSPF.
- All interfaces must be in the OSPF areas shown in the diagram.
- Do not use static routes, default routes, or other routing protocols.
- All IP addresses in the topology must be reachable from all routers.
- The OSPF network type for the link between R2 and R3 is nonbroadcast.

Initial Configurations

Router R1

```
hostname R1
!
interface Loopback0
 ip address 172.16.1.1 255.255.255.0
!
interface Serial0/0/0
 ip address 172.16.12.1 255.255.255.0
 clock rate 64000
 bandwidth 64
 no shutdown
!
router ospf 1
 network 172.16.1.0 0.0.0.255 area 0
 network 172.16.12.2 0.0.0.0 area 0
end
```

Router R2

```
hostname R2
!
interface Loopback0
 ip address 172.16.2.1 255.255.255.0
!
interface Serial0/0/0
 ip address 172.16.12.2 255.255.255.0
 bandwidth 64
 no shutdown
!
interface Serial0/0/1
 ip address 172.16.23.2 255.255.255.0
```

CCNPv6 ROUTE

```
ip ospf network non-broadcast
clock rate 64000
bandwidth 64
no shutdown
!
router ospf 1
network 172.16.2.0 0.0.0.255 area 0
network 172.16.12.0 0.0.0.255 area 0
network 172.16.23.0 0.0.0.255 area 0
end
```

Router R3

```
hostname R3
!
interface Loopback0
ip address 172.16.3.1 255.255.255.0
!
interface Serial0/0/1
ip address 172.16.23.3 255.255.255.0
ip ospf network non-broadcast
bandwidth 64
no shutdown
!
interface Serial0/1/0
ip address 172.16.34.3 255.255.255.0
clock rate 64000
bandwidth 64
no shutdown
!
router ospf 1
area 34 virtual-link 172.16.4.1
network 172.16.3.0 0.0.0.255 area 34
network 172.16.23.0 0.0.0.255 area 0
network 172.16.34.0 0.0.0.255 area 34
end
```

Router R4

```
hostname R4
!
interface Loopback0
ip address 172.16.4.1 255.255.255.0
!
interface Serial0/0/0
ip address 172.16.34.4 255.255.255.0
bandwidth 64
no shutdown
!
router ospf 1
area 34 virtual-link 172.16.34.3
network 172.16.4.0 0.0.0.255 area 40
network 172.16.34.0 0.0.0.255 area 34
end
```

Notes:

Router Interface Summary Table

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
1700	Fast Ethernet 0 (FA0)	Fast Ethernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
1800	Fast Ethernet 0/0 (FA0/0)	Fast Ethernet 0/1 (FA0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2600	Fast Ethernet 0/0 (FA0/0)	Fast Ethernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
2800	Fast Ethernet 0/0 (FA0/0)	Fast Ethernet 0/1 (FA0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)

Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. Rather than list all combinations of configurations for each router class, this table includes identifiers for the possible combinations of Ethernet and serial interfaces in the device. The table does not include any other type of interface, even though a specific router might contain one. For example, for an ISDN BRI interface, the string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.