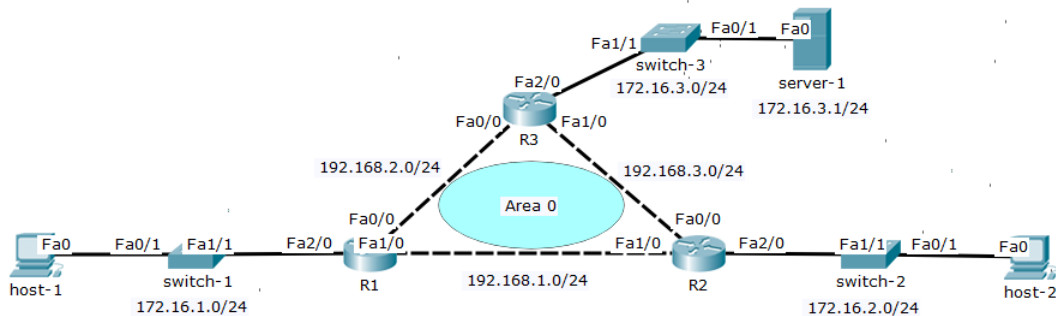


Single-Area OSPFv2

Lab Summary

Enable OSPF with a single backbone area 0 for all routers.

Figure 1 Lab Topology



Lab Configuration

Start Packet Tracer File: **OSPF**

R1

Click on the *R1* icon and select the *CLI* folder. Hit the <enter> key for user mode prompt (>).

Step 1: Enter global configuration mode

```
R1> enable
Password: ciscoconet
R1# configure terminal
```

Step 2: Enable OSPF routing with process ID 1 and router-id 192.168.255.1

```
R1(config)# router ospf 1
R1(config-router)# router-id 192.168.255.1
```

Step 3: Advertise the following subnets to OSPF neighbors and assign areas

```
R1(config-router)# network 192.168.0.0 0.0.255.255 area 0
R1(config-router)# network 172.16.1.0 0.0.0.255 area 0
R1(config-router)# end
R1# copy running-config startup-config
```

R2

Click on the *R2* icon and select the *CLI* folder. Hit the <enter> key for user mode prompt (>).

Step 4: Enter global configuration mode

```
R2> enable  
Password: cisconet  
R2# configure terminal
```

Step 5: Enable OSPF routing with process ID 1 and router-id 192.168.255.2

```
R2(config)# router ospf 1  
R2(config-router)# router-id 192.168.255.2
```

Step 6: Advertise the following subnets to OSPF neighbors and assign areas

```
R2(config-router)# network 192.168.0.0 0.0.255.255 area 0  
R2(config-router)# network 172.16.2.0 0.0.0.255 area 0  
R2(config-router)# end  
R2# copy running-config startup-config
```

R3

Click on *R3* icon and select the *CLI* folder. Hit the <enter> key for user prompt (>).

Step 7: Enter global configuration mode

```
R3> enable  
Password: cisconet  
R3# configure terminal
```

Step 8: Enable OSPF routing with process ID 1 and router-id 192.168.255.3

```
R3(config)# router ospf 1  
R3(config-router)# router-id 192.168.255.3
```

Step 9: Advertise the following subnets to OSPF neighbors and assign areas

```
R3(config-router)# network 192.168.0.0 0.0.255.255 area 0  
R3(config-router)# network 172.16.3.0 0.0.0.255 area 0  
R3(config-router)# end  
R3# copy running-config startup-config
```

Step 10: Verify Lab:

Verify the configuration is correct on all routers and confirm OSPF neighbor adjacencies. Verify all connected subnets and neighbor routes are installed in the routing table of router-1. Ping from host-1 and host-2 to server-1 and verify routing is working correctly.

R1# show running-config

R1# show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.255.3	1	FULL/BDR	00:00:35	192.168.2.2	FastEthernet0/0
192.168.255.2	1	FULL/BDR	00:00:39	192.168.1.2	FastEthernet1/0

R2# show ip ospf neighbor

R3# show ip ospf neighbor

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

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 3 subnets

C 172.16.1.0 is directly connected, FastEthernet2/0
O 172.16.2.0 [110/2] via 192.168.1.2, 00:23:56, FastEthernet1/0
O 172.16.3.0 [110/2] via 192.168.2.2, 00:22:19, FastEthernet0/0
C 192.168.1.0/24 is directly connected, FastEthernet1/0
C 192.168.2.0/24 is directly connected, FastEthernet0/0
O 192.168.3.0/24 [110/2] via 192.168.2.2, 00:22:54, FastEthernet0/0
[110/2] via 192.168.1.2, 00:22:54, FastEthernet1/0

host-1: c:/> **ping 172.16.3.1**

c:\>**ping 172.16.3.1**

Pinging 172.16.3.1 with 32 bytes of data:

Reply from 172.16.3.1: bytes=32 time=13ms TTL=126

Reply from 172.16.3.1: bytes=32 time=30ms TTL=126

Reply from 172.16.3.1: bytes=32 time=30ms TTL=126

Reply from 172.16.3.1: bytes=32 time=34ms TTL=126

Ping statistics for 172.16.3.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 13ms, Maximum = 34ms, Average = 26ms

host-2: c:/> **ping 172.16.3.1**

Lab Notes

OSPF is a classless routing protocol where wildcard masks define subnets for advertising. The routes are advertised only to the area specified. OSPF is enabled with the **network area** command configured from OSPF router configuration mode. OSPF can be enabled per interface as well.

For example assigning an interface to OSPF process 1 and advertise routes to area 0 would require command **ip ospf 1 area 0**. The result is that OSPF will advertise the subnet of that local interface to OSPF neighbors. It takes precedence as well when a subnet configured with **network area** command is within the range of an interface subnet address.