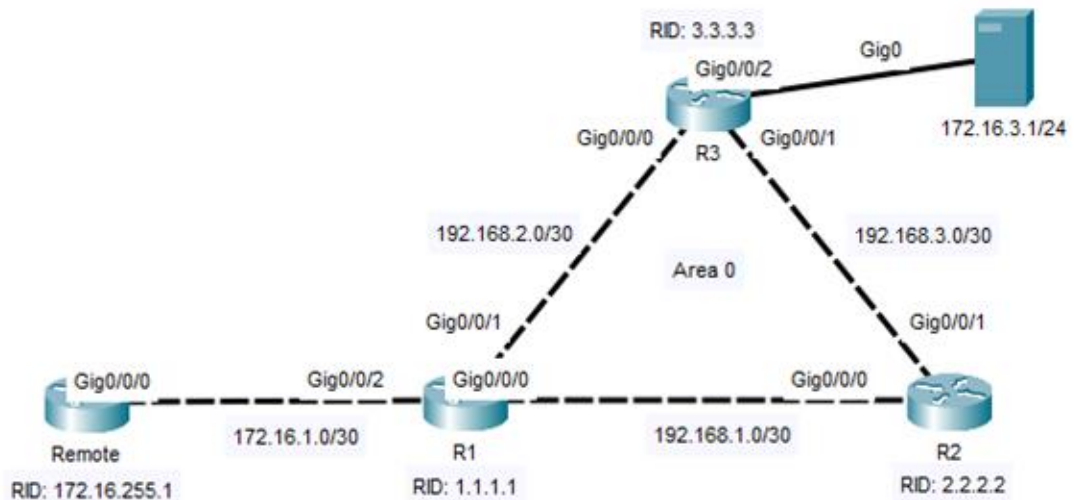


OSPF Router ID

Lab Summary

Configure router ID on all routers to uniquely identify each router within the OSPF routing domain.

Figure 1 Lab Topology



Lab Configuration

Start Packet Tracer File: **ospf router id.pkt**

Click on *R1* router and select *CLI* folder.

Step 1: Enter global configuration mode.

```
R1>enable
```

```
R1#configure terminal
```

Step 2: Configure OSPF router ID 1.1.1.1 on R1 router.

```
R1(config)#router ospf 1
```

```
R1(config-router)#router-id 1.1.1.1
```

```
R1(config-router)#end
```

```
R1#copy running-config startup-config
```

Click on *R2* router and select the *CLI* folder.

Step 3: Enter global configuration mode

```
R2>enable  
R2#configure terminal
```

Step 4: Configure OSPF router ID 2.2.2.2 on R2 router.

```
R2(config)#router ospf 1  
R2(config-router)#router-id 2.2.2.2  
R2(config-router)#end  
R2#copy running-config startup-config
```

Click on *R3* router and select *CLI* folder.

Step 5: Enter global configuration mode

```
R3>enable  
R3#configure terminal
```

Step 6: Configure OSPF router ID 3.3.3.3 on R3 router.

```
R3(config)#router ospf 1  
R3(config-router)#router-id 3.3.3.3  
R3(config-router)#end  
R3#copy running-config startup-config
```

Click on *Remote* router and select the *CLI* folder.

Step 7: Enter global configuration mode

```
Remote>enable  
Remote#configure terminal
```

Step 8: Configure OSPF loopback interface to automatically assign as router ID and enable OSPF routing on the interface.

```
Remote(config)#interface loopback0  
Remote(config-if)#ip address 172.16.255.1 255.255.255.255  
Remote(config-if)#ip ospf 1 area 0  
Remote(config-if)#end  
Remote#copy running-config startup-config
```

Step 9: Clear OSPF process 1 on all routers to reset and rebuild OSPF database and routing tables. Perform router reload if Packet Tracer does not reset OSPF routing tables.

R1#**clear ip ospf process**

Reset ALL OSPF processes? [no]: **yes**

R2#**clear ip ospf process**

Reset ALL OSPF processes? [no]: **yes**

R3#**clear ip ospf process**

Reset ALL OSPF processes? [no]: **yes**

Remote#**clear ip ospf process**

Reset ALL OSPF processes? [no]: **yes**

Step 10: Verify Lab

There are interface-level and global IOS commands available to verify the operational status of router ID on Cisco devices shown here.

R1#**show ip ospf neighbor**

| Neighbor ID | Pri | State | Dead Time | Address | Interface |
|--------------|-----|---------|-----------|-------------|----------------------|
| 2.2.2.2 | 1 | FULL/DR | 00:00:38 | 192.168.1.2 | GigabitEthernet0/0/0 |
| 3.3.3.3 | 1 | FULL/DR | 00:00:38 | 192.168.2.2 | GigabitEthernet0/0/1 |
| 172.16.255.1 | 1 | FULL/DR | 00:00:38 | 172.16.1.1 | GigabitEthernet0/0/2 |

R2#**show ip ospf neighbor**

| Neighbor ID | Pri | State | Dead Time | Address | Interface |
|-------------|-----|----------|-----------|-------------|----------------------|
| 1.1.1.1 | 1 | FULL/BDR | 00:00:34 | 192.168.1.1 | GigabitEthernet0/0/0 |
| 3.3.3.3 | 1 | FULL/DR | 00:00:34 | 192.168.3.1 | GigabitEthernet0/0/1 |

R1#**show ip ospf interface Gi0/0/1**

<output omitted>

GigabitEthernet0/0/1 is up, line protocol is up

Internet address is **192.168.2.1/30, Area 0**

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

R1#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 1.1.1.1

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.1.0 0.0.0.3 area 0

192.168.2.0 0.0.0.3 area 0

172.16.1.0 0.0.0.3 area 0

192.168.255.1 0.0.0.0 area 0

Routing Information Sources:

| Gateway | Distance | Last Update |
|--------------|----------|-------------|
| 1.1.1.1 | 110 | 00:12:45 |
| 2.2.2.2 | 110 | 00:12:45 |
| 3.3.3.3 | 110 | 00:12:45 |
| 172.16.255.1 | 110 | 00:12:45 |

Distance: (default is **110**)

Lab Notes

The purpose of a router ID (RID) is to uniquely identify a router for establishing neighbor adjacency and advertising LSAs. OSPF neighbors must be assigned a unique router ID to establish adjacency. It is a 32-bit dotted decimal address that serves as a label and **not** a routed IP address.

In this lab each router is assigned a router ID based on the hostname. For example, R1 is assigned router ID 1.1.1.1 to make troubleshooting easier. The exception is Remote router that derives router ID from the highest loopback IP address. Since there is only one loopback address, that was assigned by default.