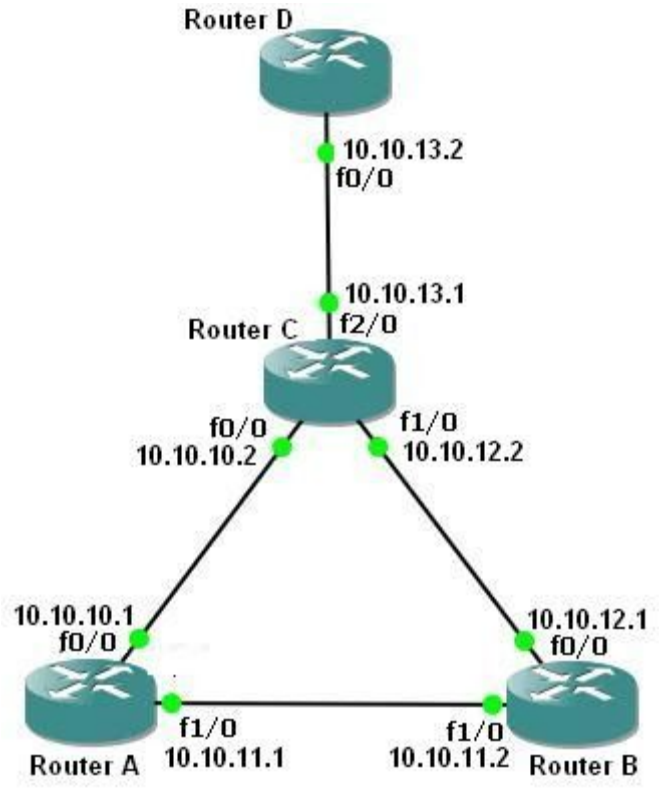
Cisco Single Area OSPF Configuration

“Open Shortest Path First (OSPF) is a routing protocol for Internet Protocol (IP) networks”



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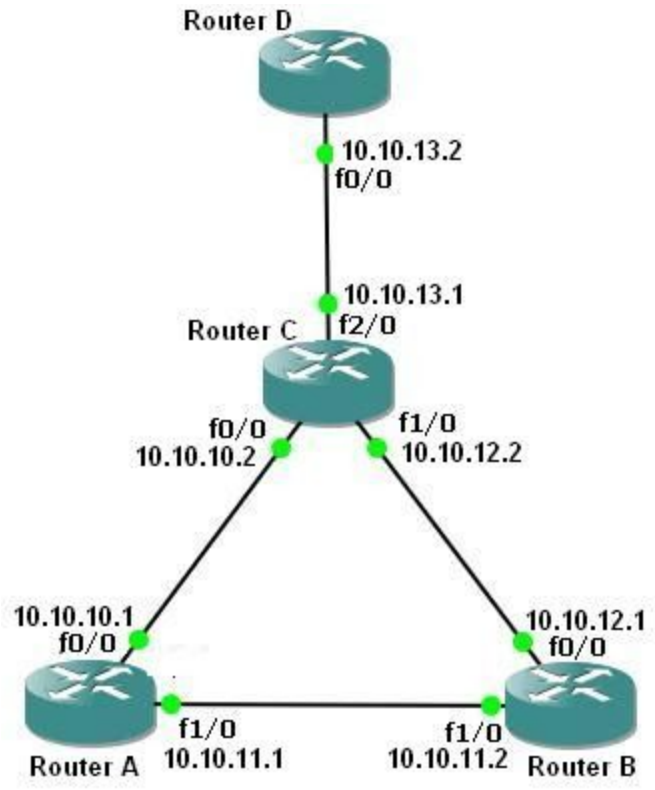
OSPF Cisco Configuration

OSPF (Open Shortest Path First) protocol is a well-know routing protocol that is widely used today.To configure a network for **OSPF** properly there are some steps. For basic **OSPF Configuration**, the following scenario will be a good example.



Single Area OSPF Configuration Topology

Cisco OSPF Configuration Steps

First of all, we will configure the routers' interfaces. After that we will configure **OSPF** as our **Routing Protocol**. Here we assume that all the interfaces including loopback interfaces, their speed, duplex and descriptions have been configured.

To configure **OSPF**, follow the below steps:

1. Enabling OSPF Process

In router A, we will enable **OSPF** Process, with Process Number "**1**".

```
A(config)# router ospf 1
A(config-router)#
```

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2. Adding OSPF Networks

After enabling **OSPF** process on our Cisco Router A, then, we will add our networks that will be in OSPF network with their wildcard masks.

```
A(config-router)# network 10.10.10.0 0.0.0.255 area 0
A(config-router)# network 10.10.11.0 0.0.0.255 area 0
A(config-router)# end
```

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3. Saving OSPF Config

```
A # copy running-config startup-config
```

Note : Verify IP addressing and interfaces Use the show ip interface brief command to verify that the IP addressing is correct and that the interfaces are active.

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4. OSPF Config on Router B

We will configure Router B like Router A. We will enable **OSPF** and then add OSPF Networks.

```
B(config)# router ospf 1
B(config-router)# network 10.10.11.0 0.0.0.255 area 0
B(config-router)# network 10.10.12.0 0.0.0.255 area 0
B(config-router)# exit
B # copy running-config startup-config
```

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5. OSPF Config on Router C

We will configure Router C like Router A. We will enable **OSPF** and then add OSPF Networks.

```
C(config)# router ospf 1
C(config-router)# network 10.10.10.0 0.0.0.255 area 0
C(config-router)# network 10.10.12.0 0.0.0.255 area 0
C(config-router)# network 10.10.13.0 0.0.0.255 area 0
C(config-router)# end
```

```
C# copy running-config startup-config
```

TASK :

Task: Configure OSPF Router IDs The OSPF router ID is used to uniquely identify the router in the OSPF routing domain. A router ID is an IP address. Cisco routers derive the Router ID in one of three ways and with the following precedence:

1. IP address configured with the OSPF router-id command.
2. Highest IP address of any of the router's loopback addresses.
3. Highest active IP address on any of the router's physical interfaces.

Step 1: Examine the current router IDs in the topology. Since no router IDs or loopback interfaces have been configured on the three routers, the router ID for each router is determined by the highest IP address of any active interface.
What is the router ID for R1? _____
What is the router ID for R2? _____
What is the router ID for R3? _____

Loopback interface

A loopback interface is a logical, virtual interface in a Cisco Router. A loopback interface is not a physical interface like Fast Ethernet interface or Gigabit Ethernet interface. A loopback interface has many uses. Loopback interface's IP Address determines a router's OSPF Router ID.

R1(config)#interface loopback 0
R1(config-if)#ip address 10.1.1.1 255.255.255.255

R2(config)#interface loopback 0
R2(config-if)#ip address 10.2.2.2 255.255.255.255

R3(config)#interface loopback 0
R3(config-if)#ip address 10.3.3.3 255.255.255.255

Step 3: Reload the routers to force the new Router IDs to be used. When a new Router ID is configured, it will not be used until the OSPF process is restarted. Make sure that the current configuration is saved to NRAM, and then use the reload command to restart each of the routers..

When the router is reloaded,
What is the router ID for R1? _____

When the router is reloaded,
What is the router ID for R2? _____

When the router is reloaded,
What is the router ID for R3? _____

FINAL TASK

Step 5: Use the router-id command to change the router ID on the R1 router. Note: Some IOS versions do not support the router-id command. If this command is not available, continue to the next Task.

R1(config)#router ospf 1
R1(config-router)#router-id 10.4.4.4