

## PRACTICAL: 10

Date: \_\_\_\_\_

### AIM: - Perform routing using OSPF in packet tracer

#### Introduction:

Open shortest path first (OSPF) is a link-state routing protocol which is used to find the best path between the source and the destination router using its own shortest path first (SPF) algorithm. A link-state routing protocol is a protocol which uses the concept of triggered updates, i.e., if there is a change observed in the learned routing table then the updates are triggered

OSPF is an Interior Gateway Protocol (IGP) standardized by the Internet Engineering Task Force (IETF) and commonly used in large Enterprise networks. OSPF is a link-state routing protocol providing fast convergence and excellent scalability. Like all link-state protocols, OSPF is very efficient in its use of network bandwidth.

**Criteria** –To form neighbor ship in OSPF, there is a criteria for both the routers:

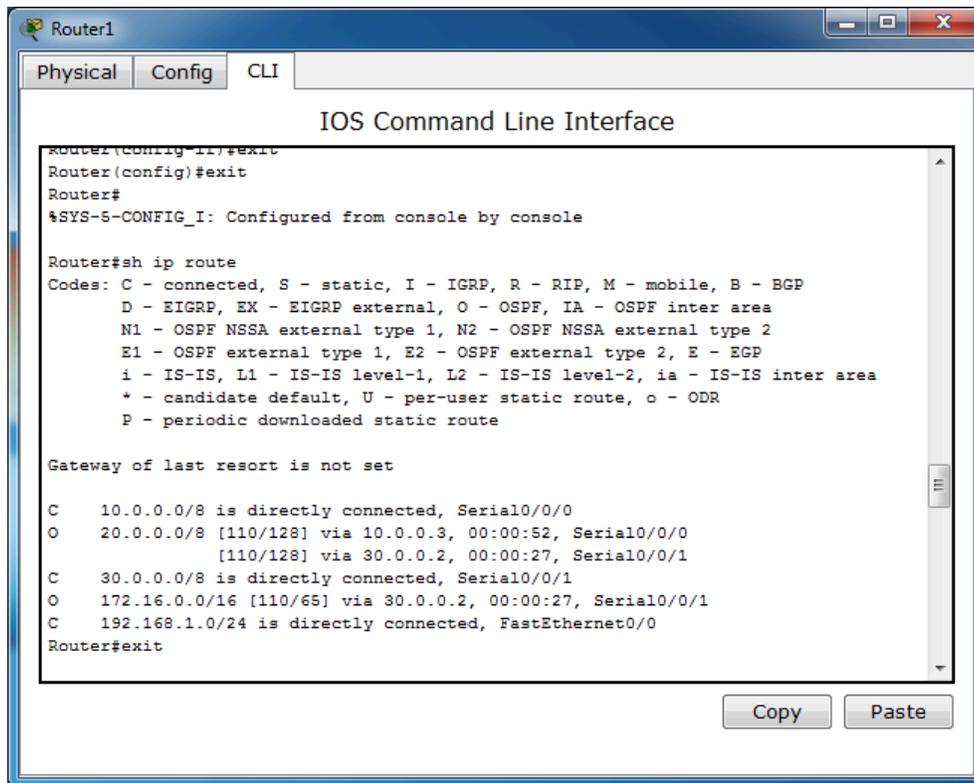
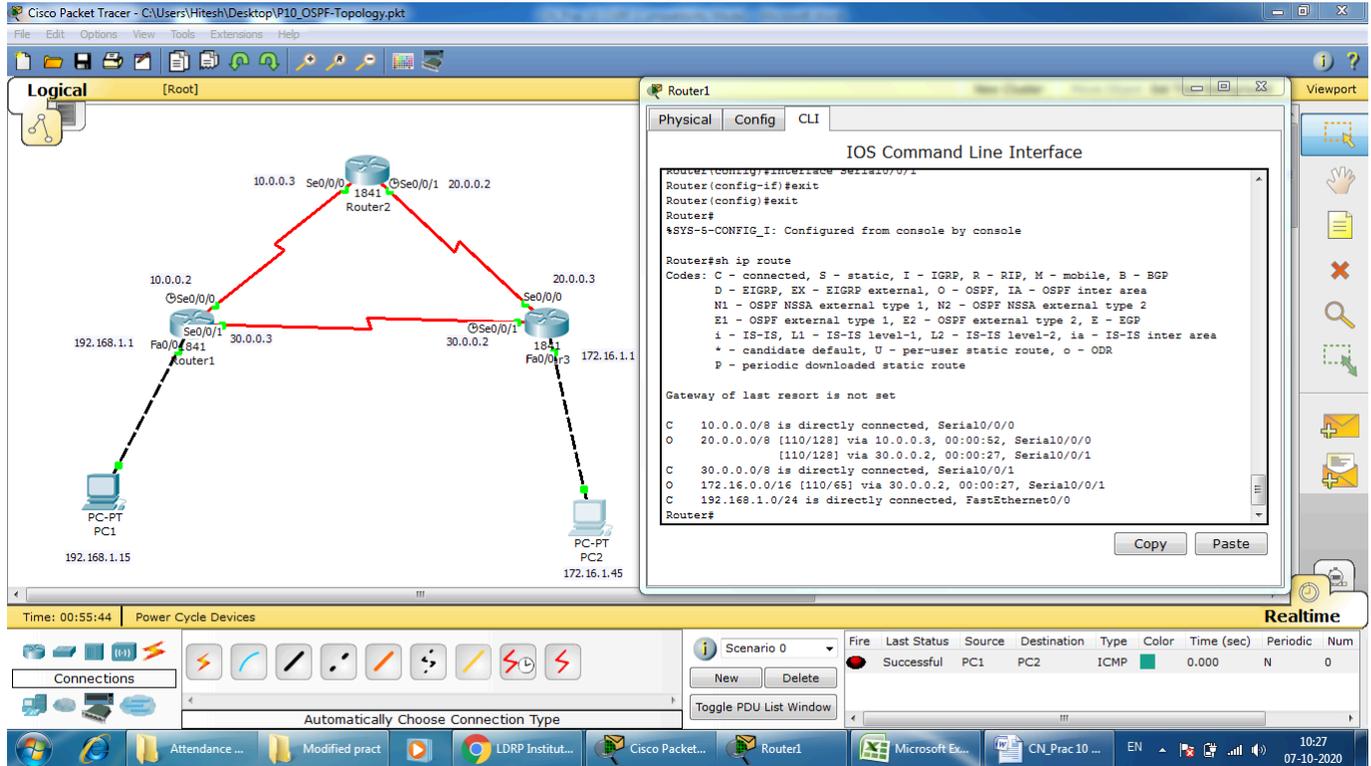
- ✓ It should be present in same area
- ✓ Router Id must be unique
- ✓ Subnet mask should be same
- ✓ Hello and dead timer should be same
- ✓ Stub flag must match
- ✓ Authentication must match

#### Commands for reference:

```
Router# show ip route
Router# show ip interface brief
Router# configure terminal
Router(config)# router ospf 10                               (Process ID)
Router(config-router)# network 172.16.1.0 0.0.255.255 area 1
Router(config-router)# network 192.168.1.0 0.0.0.255 area 1
Router(config-router)# exit
```

Net map for configuration of network with OSPF

Your screen shot here



**Commands for reference:**

Commands for Router-1 (above topology)

```
Router> enable
Router# show ip route
Router# show ip interface brief
Router# configure terminal
Router(config)# router ospf 10 (Process ID)
Router(config-router)# network 192.168.1.0 0.0.0.255 area 1
Router(config-router)# network 10.0.0.0 0.255.255.255 area 1
Router(config-router)# network 30.0.0.0 0.255.255.255 area 1
Router(config-router)#
Go to config menu and press on save button

OR Press Ctrl + z for save
Router(config-router)# exit
```

**Commands for reference:**

Commands for Router-2 (above topology)

```
Router> enable
Router# show ip route
Router# show ip interface brief
Router# configure terminal
Router(config)# router ospf 10
Router(config-router)# network 10.0.0.0 0.255.255.255 area 1
Router(config-router)# network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#
Go to config menu and press on save button

OR Press Ctrl + z for save
Router(config-router)# exit
```

**Commands for reference:**

Commands for Router-3 (above topology)

```
Router> enable
Router# show ip route
Router# show ip interface brief
Router# configure terminal
Router(config)# router ospf 10
Router(config-router)# network 172.16.1.0 0.0.255.255 area 1

Router(config-router)# network 20.0.0.0 0.255.255.255 area 1
Router(config-router)# network 30.0.0.0 0.255.255.255 area 1
Router(config-router)#
                Go to config menu and press on save button

                OR Press Ctrl + z for save
Router(config-router)# exit
```

Your Steps / IP address Tables like below for PC's and Router's

Set the following IP address, subnet mask and default gateway for each PC.

PC Name	IP Address	Subnet Mask	Default Gateway
PC 1	192.168.1.15	255.255.255.0	192.168.1.1
PC 2	172.16.1.45	255.255.0.0	172.16.1.1

Router Name	interface	IP Address	Subnet Mask
Router1	Fast Ethernet 0/0	192.168.1.1	255.255.255.0
Router1	Serial 0/0/0	10.0.0.2	255.0.0.0
Router1	Serial 0/0/1	30.0.0.3	255.0.0.0
Router2	Serial 0/0/0	10.0.0.3	255.0.0.0
Router2	Serial 0/0/1	20.0.0.2	255.0.0.0
Router3	Fast Ethernet 0/0	172.16.1.1	255.255.0.0
Router3	Serial 0/0/0	20.0.0.3	255.0.0.0
Router3	Serial 0/0/1	30.0.0.2	255.0.0.0

**Lab Exercise**

1. Which kind of protocol can be used by OSPF?

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2. Differentiate OSPF with other protocols (RIP, IGRP,EIGRP, OSPF)

<b>characteristics</b>	<b>RIP</b>	<b>IGRP</b>	<b>EIGRP</b>	<b>OSPF</b>
Full form				
Standardization (Routing Protocol)				
Network Scale (size of organization)				
supports Maximum Routers				
Representation in routing table				
Administrator distance				
Calculate metric (in terms of)				

*Sign of Faculty.*