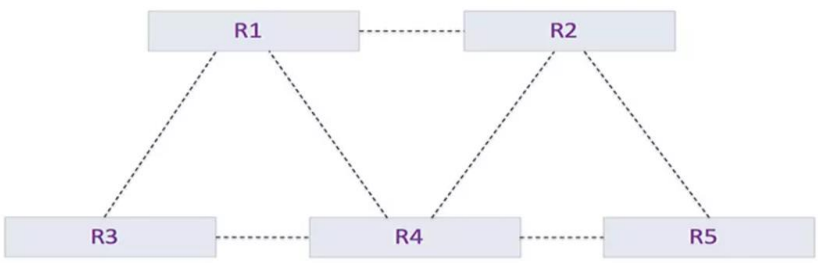
# PRACTICAL-5

## AIM:

An organization is having 3 braches at 3 different locations. The founder of organization wants to configure the WAN connection amongst all the branches for better communication, file sharing and resource sharing. Demonstrate the dynamic routing configuration using OSPF protocol for the given scenario using cisco packet tracer.

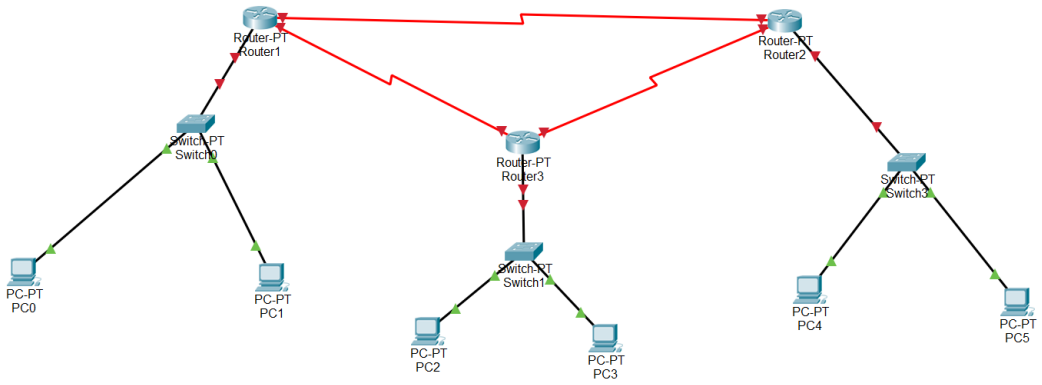
## THEORY:

- OSPF stands for “OPEN SHORTEST PATH FIRST”
- OSPF is a routing protocol for IP networks
- OSPF was designed as an INTERIOR GATEWAY PROTOCOL (IGP), for use in an autonomous system such as a local area network (LAN).
- It implements Dijkstra's algorithm, also known as the shortest path first (SPF) algorithm
- Two routers speaking OSPF to each other exchange information about the routes they know about and the cost for them to get there.
- When many OSPF routers are part of the same network, information about all of the routes in a network are learned by all of the OSPF routers within that network—technically called an **area**.
- Each OSPF router passes along information about the routes and costs they’ve heard about to all of their adjacent OSPF routers, called **neighbors**.

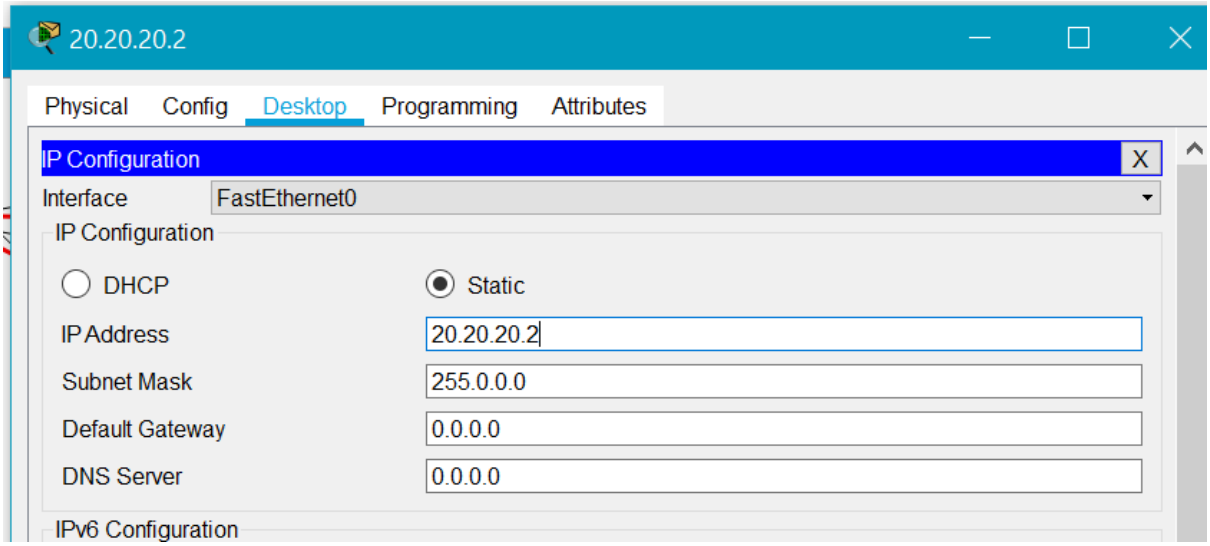


## PRACTICAL IMPLEMENTATION:

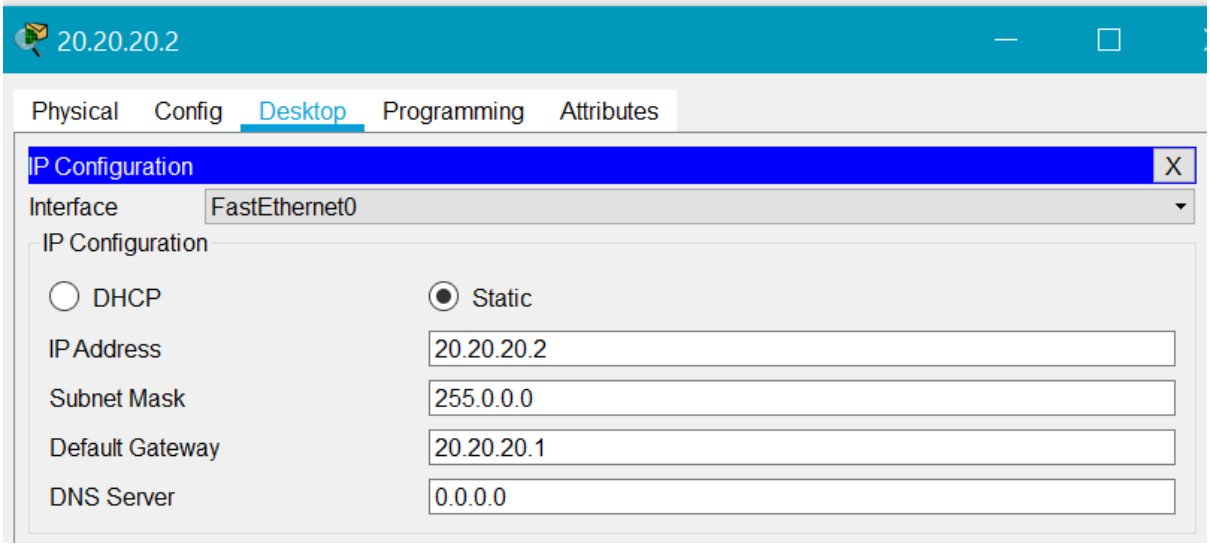
- As there are 3 different branches at 3 different locations, so we will need 3 routers
- Also, we will connect the individual router with switches so, more PCs can be added into future.
- Currently, we will start with two PCs connected with




- Now, we will assign the IP address to each PC and also, we will define the network.



❖ We will also assign the default gateway to all.

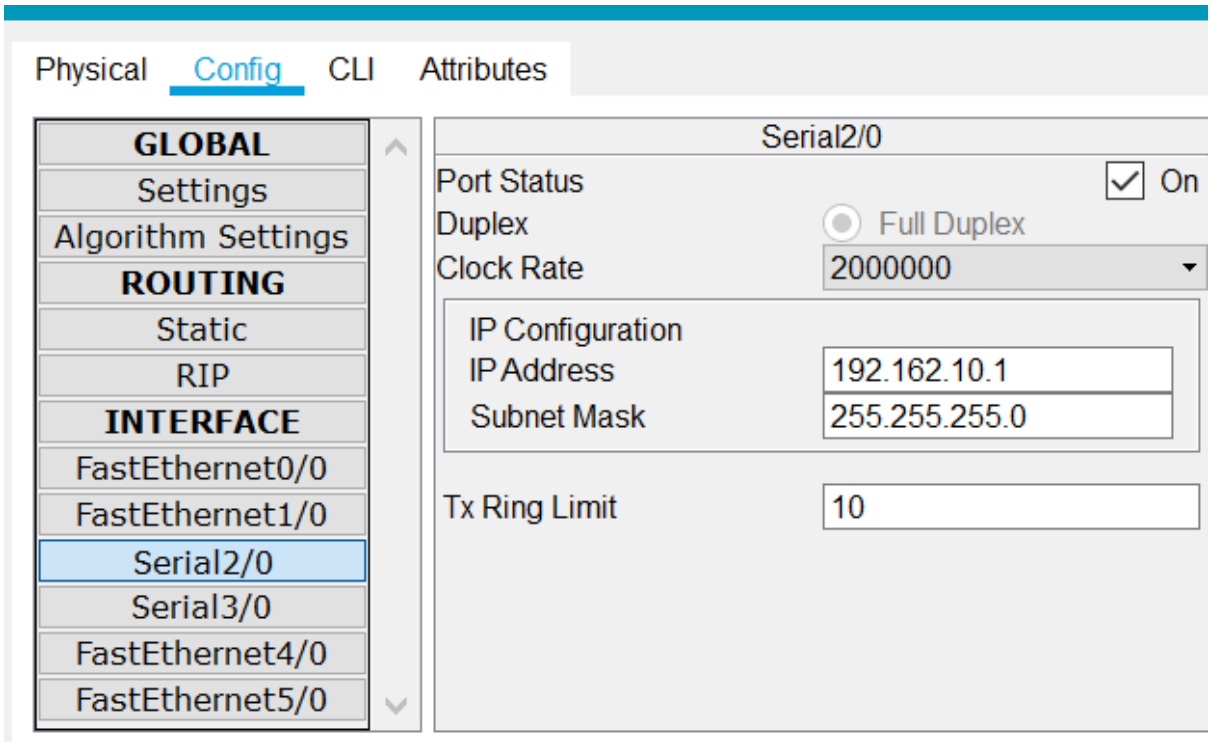


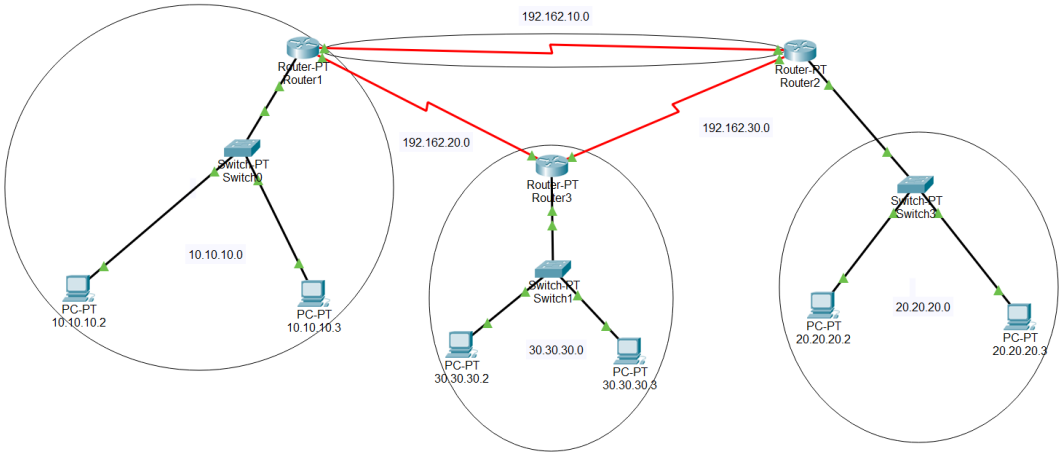

❖ Now, we will configure each and every router.

```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with
CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.10.10.1 255.255.255.0
Router(config-if)#no shutdown
```

❖ We will perform the same steps with all the routers till the connections are established.

❖ Also, we can use config interface to configure the connection.




**CURRENT STATUS OF THE NETWORK AFTER ALL THE DEVICES ARE CONFIGURED.**

- Now, we will provide the routing information

```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 10.10.10.0 0.255.255.255 area 0
Router(config-router)#network 192.162.10.0 0.0.0.255 area 0
Router(config-router)#network 192.162.20.0 0.0.0.255 area 0
Router(config-router)#exit
```

- Follow the above steps in all the routers.

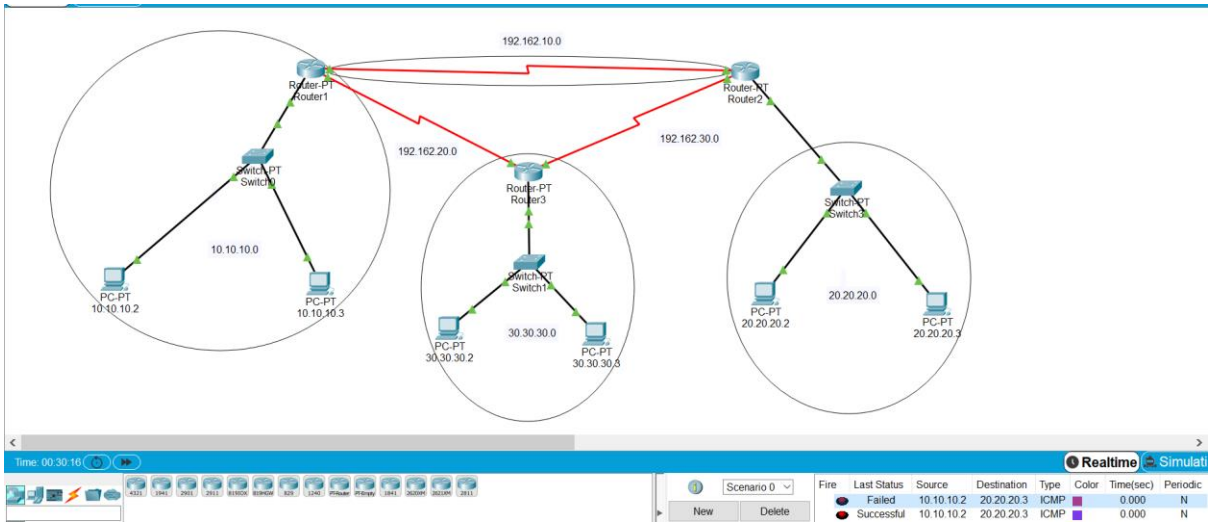
- To check the routing table, exit from config mode and write “show ip route”.

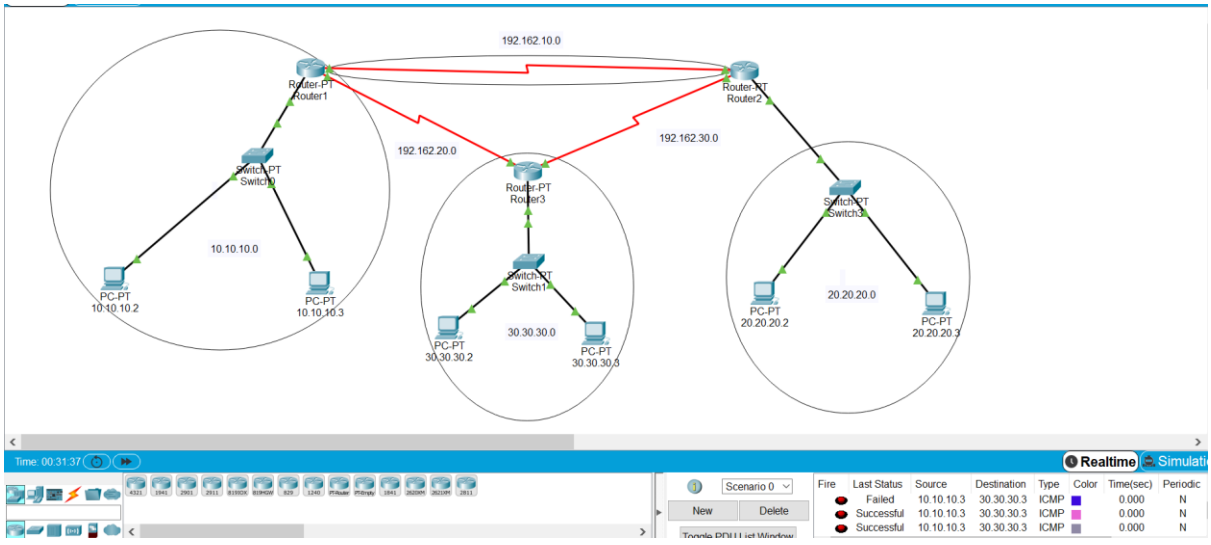
```
Router#
00:25:28: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.30.2 on
Serial2/0 from LOADING to FULL, Loading Done

00:27:01: %OSPF-5-ADJCHG: Process 1, Nbr 192.162.30.2 on
Serial3/0 from LOADING to FULL, Loading Done
```

**Routers are exchanging the routing information.**

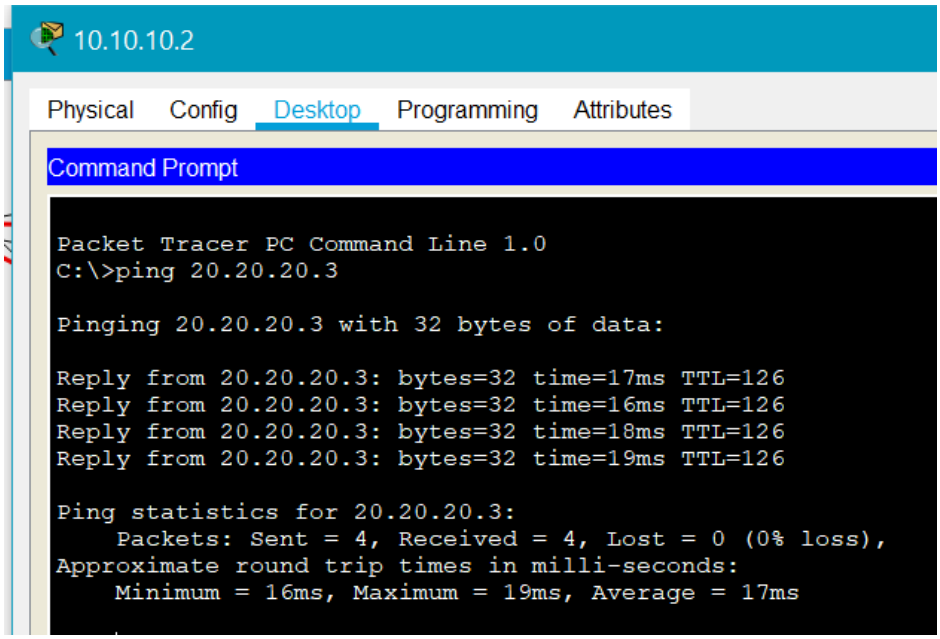
# TESTING THE WORKING OF NETWORK:

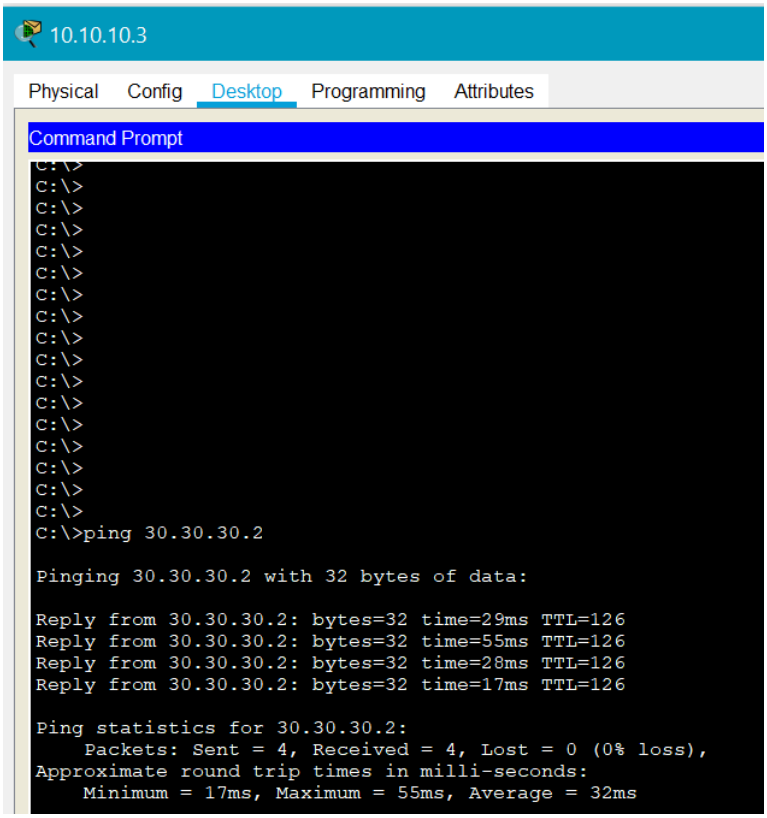
## 1. PDU TEST

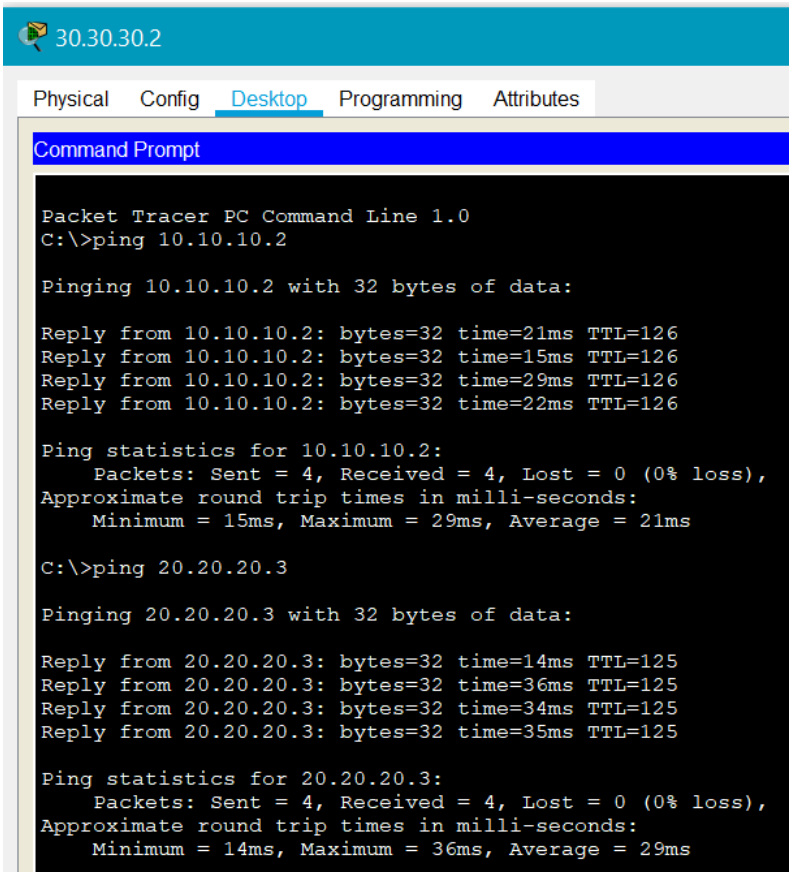


## 2. PING TEST:


10.10.10.2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 20.20.20.3
Pinging 20.20.20.3 with 32 bytes of data:
Reply from 20.20.20.3: bytes=32 time=17ms TTL=126
Reply from 20.20.20.3: bytes=32 time=16ms TTL=126
Reply from 20.20.20.3: bytes=32 time=18ms TTL=126
Reply from 20.20.20.3: bytes=32 time=19ms TTL=126
Ping statistics for 20.20.20.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 16ms, Maximum = 19ms, Average = 17ms


10.10.10.3
Physical
Config
Desktop
Programming
Attributes
Command Prompt
C:\>
C:\>ping 30.30.30.2
Pinging 30.30.30.2 with 32 bytes of data:
Reply from 30.30.30.2: bytes=32 time=29ms TTL=126
Reply from 30.30.30.2: bytes=32 time=55ms TTL=126
Reply from 30.30.30.2: bytes=32 time=28ms TTL=126
Reply from 30.30.30.2: bytes=32 time=17ms TTL=126
Ping statistics for 30.30.30.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 17ms, Maximum = 55ms, Average = 32ms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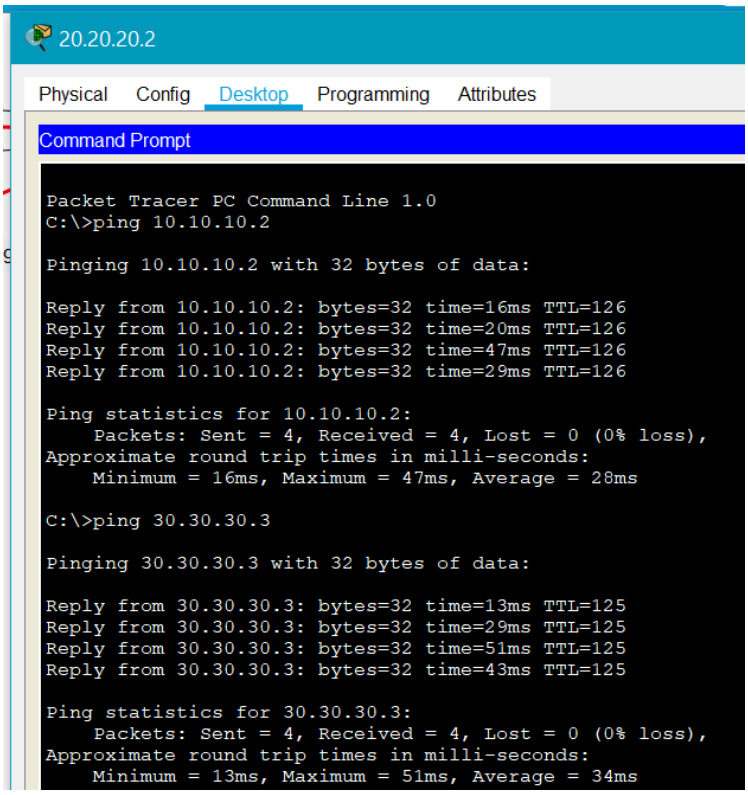
Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.2
Pinging 10.10.10.2 with 32 bytes of data:
Reply from 10.10.10.2: bytes=32 time=21ms TTL=126
Reply from 10.10.10.2: bytes=32 time=15ms TTL=126
Reply from 10.10.10.2: bytes=32 time=29ms TTL=126
Reply from 10.10.10.2: bytes=32 time=22ms TTL=126
Ping statistics for 10.10.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 15ms, Maximum = 29ms, Average = 21ms
C:\>ping 20.20.20.3
Pinging 20.20.20.3 with 32 bytes of data:
Reply from 20.20.20.3: bytes=32 time=14ms TTL=125
Reply from 20.20.20.3: bytes=32 time=36ms TTL=125
Reply from 20.20.20.3: bytes=32 time=34ms TTL=125
Reply from 20.20.20.3: bytes=32 time=35ms TTL=125
Ping statistics for 20.20.20.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 14ms, Maximum = 36ms, Average = 29ms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Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.2
Pinging 10.10.10.2 with 32 bytes of data:
Reply from 10.10.10.2: bytes=32 time=16ms TTL=126
Reply from 10.10.10.2: bytes=32 time=20ms TTL=126
Reply from 10.10.10.2: bytes=32 time=47ms TTL=126
Reply from 10.10.10.2: bytes=32 time=29ms TTL=126
Ping statistics for 10.10.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 16ms, Maximum = 47ms, Average = 28ms
C:\>ping 30.30.30.3
Pinging 30.30.30.3 with 32 bytes of data:
Reply from 30.30.30.3: bytes=32 time=13ms TTL=125
Reply from 30.30.30.3: bytes=32 time=29ms TTL=125
Reply from 30.30.30.3: bytes=32 time=51ms TTL=125
Reply from 30.30.30.3: bytes=32 time=43ms TTL=125
Ping statistics for 30.30.30.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 13ms, Maximum = 51ms, Average = 34ms

## CONCLUSION:

By performing the above practical, we learned the concept of OSPF and how it works in the real world.

Also, we learned how to create a topology and configure OSPF to depict the real time working of OSPF.