

## Exercise – 9 SINGLEAREA OSPF

### Aim

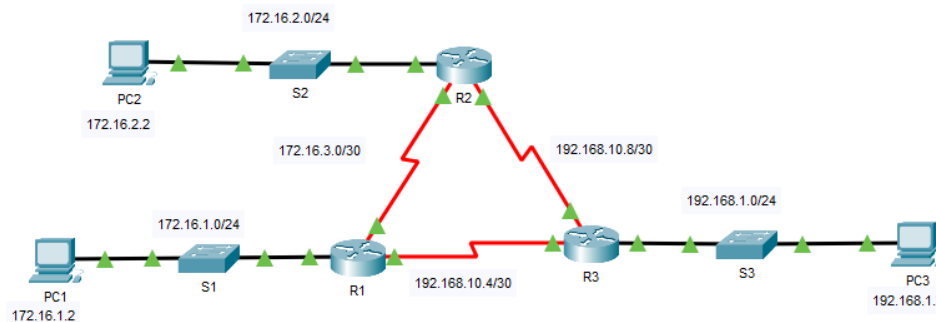
To Configuring single area OSPF

### Pre-requisite:

Open Shortest Path First (OSPF) protocol

### Procedure:

1. From the Network Devices category, select routers, and from the devices drag 3 routers into the workspace.
2. Select the End Devices sub-category from End Devices, and drag 3 PCs into the workspace.
3. Connect all the devices using crossover cables via switches and connect routers using serial DTE cables.



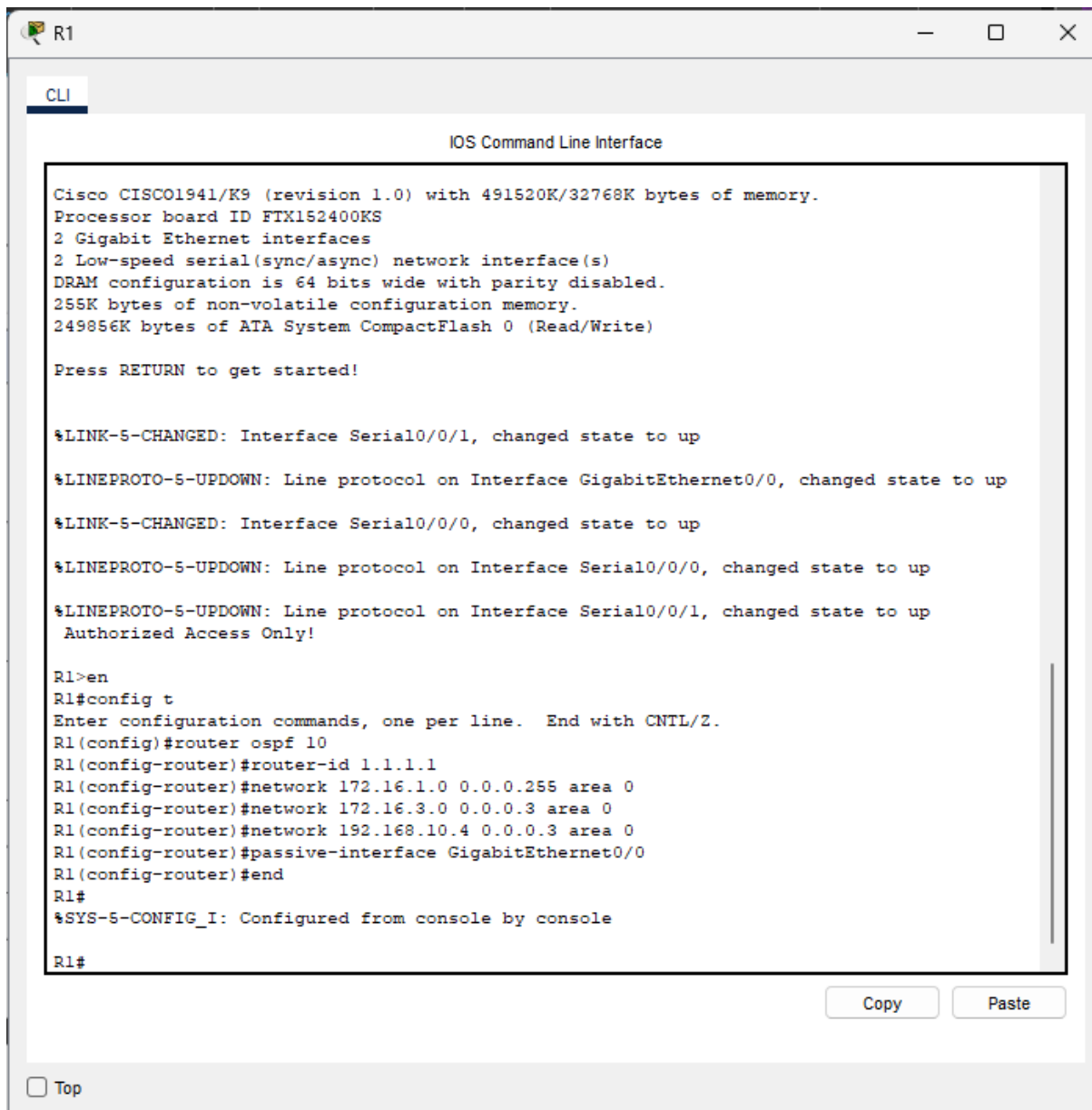
4. Assign the ip-addresses using the address table given below

Addressing Table

Device	Interface	IP Address	Subnet Mask
R1	G0/0	172.16.1.1	255.255.255.0
	S0/0/0	172.16.3.1	255.255.255.252
	S0/0/1	192.168.10.5	255.255.255.252
R2	G0/0	172.16.2.1	255.255.255.0
	S0/0/0	172.16.3.2	255.255.255.252
	S0/0/1	192.168.10.9	255.255.255.252
R3	G0/0	192.168.1.1	255.255.255.0
	S0/0/0	192.168.10.6	255.255.255.252
	S0/0/1	192.168.10.10	255.255.255.252
PC1	NIC	172.16.1.2	255.255.255.0
PC2	NIC	172.16.2.2	255.255.255.0
PC3	NIC	192.168.1.2	255.255.255.0

5. Configure the OSPF on the routers R1 using the following commands

- enable
- conf t
- router ospf 10
- router-id 1.1.1.1
- network 172.16.1.0 0.0.0.255 area 0
- network 172.16.3.0 0.0.0.3 area 0
- network 192.168.10.4 0.0.0.3 area 0
- passive-interface GigabitEthernet0/0
- end



```
R1
CLI
IOS Command Line Interface

Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
Authorized Access Only!

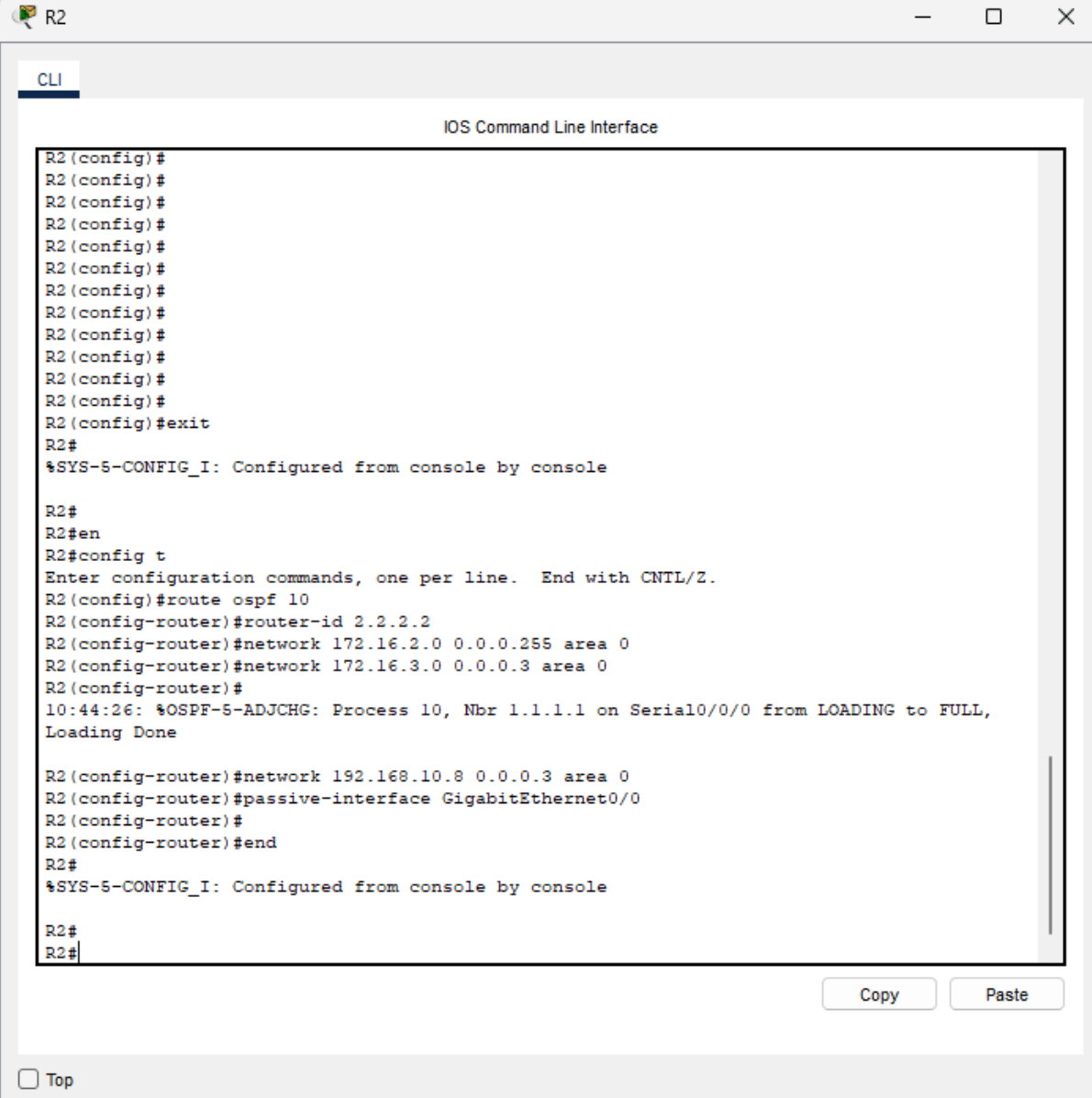
R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 10
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.16.1.0 0.0.0.255 area 0
R1(config-router)#network 172.16.3.0 0.0.0.3 area 0
R1(config-router)#network 192.168.10.4 0.0.0.3 area 0
R1(config-router)#passive-interface GigabitEthernet0/0
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#
```

☐ Top

6. Similarly Configure the router R2 with following commands

- enable
- conf t
- router ospf 10
- router-id 2.2.2.2
- network 172.16.2.0 0.0.0.255 area 0
- network 172.16.3.0 0.0.0.3 area 0
- network 192.168.10.8 0.0.0.3 area 0
- passive-interface GigabitEthernet0/0
- end



```
R2
CLI
IOS Command Line Interface

R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#
R2#en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 10
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 172.16.2.0 0.0.0.255 area 0
R2(config-router)#network 172.16.3.0 0.0.0.3 area 0
R2(config-router)#
10:44:26: %OSPF-5-ADJCHG: Process 10, Nbr 1.1.1.1 on Serial0/0/0 from LOADING to FULL,
Loading Done

R2(config-router)#network 192.168.10.8 0.0.0.3 area 0
R2(config-router)#passive-interface GigabitEthernet0/0
R2(config-router)#
R2(config-router)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

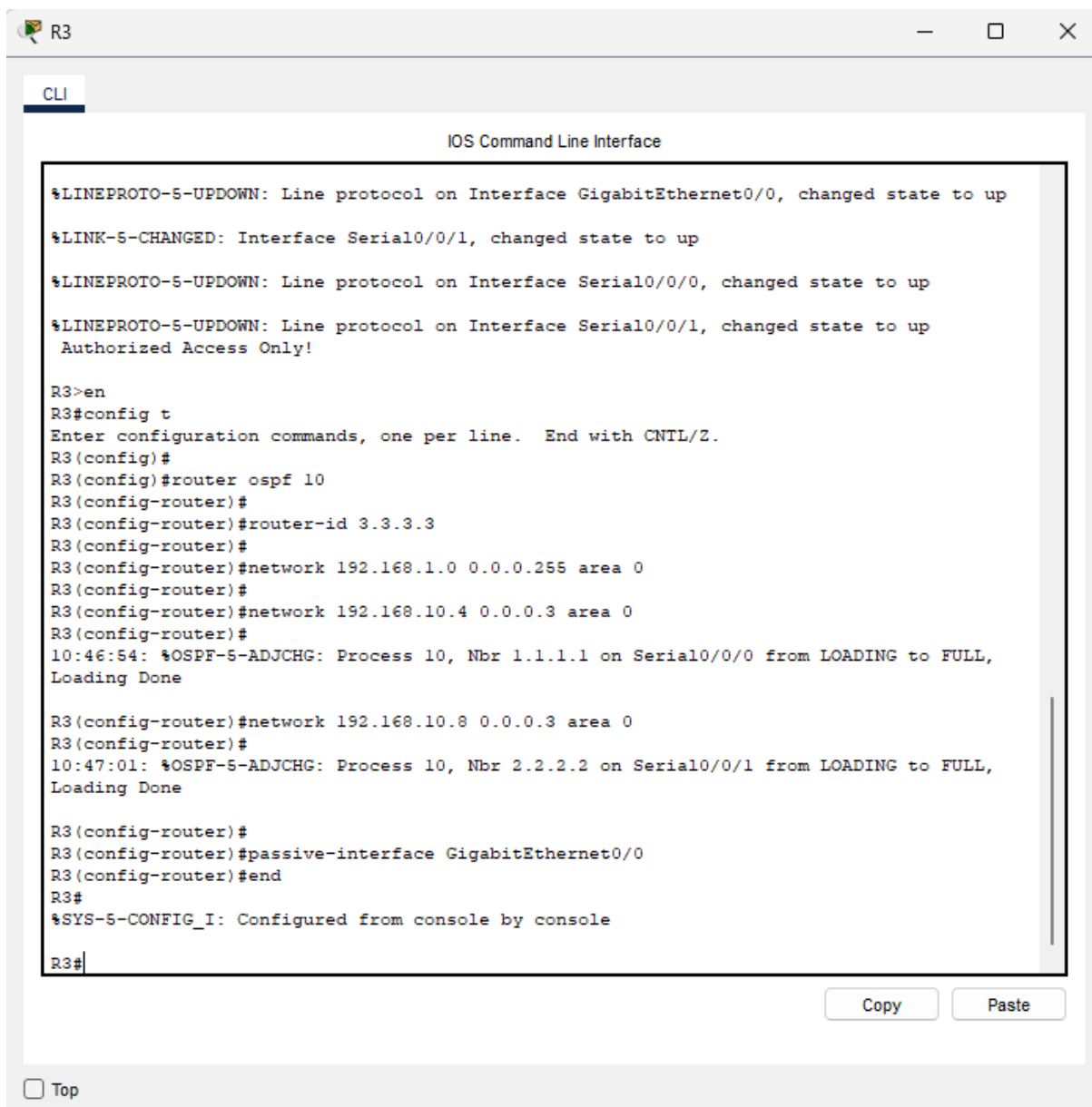
R2#
R2#
```

Copy Paste

☐ Top

7. Similarly Configure the router R3 with following commands

- enable
- conf t
- router ospf 10
- router-id 3.3.3.3
- network 192.168.1.0 0.0.0.255 area 0
- network 192.168.10.4 0.0.0.3 area 0
- network 192.168.10.8 0.0.0.3 area 0
- passive-interface GigabitEthernet0/0
- end



The screenshot shows a terminal window titled "R3" with a "CLI" tab. The window displays the IOS Command Line Interface. At the top, there are several system messages: "%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up", "%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up", "%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up", and "%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up Authorized Access Only!". The user enters the command "R3>en" to enter enable mode, followed by "R3#config t" to enter configuration mode. The prompt changes to "R3(config)#". The user then enters the following commands: "R3(config)#router ospf 10", "R3(config-router)#", "R3(config-router)#router-id 3.3.3.3", "R3(config-router)#", "R3(config-router)#network 192.168.1.0 0.0.0.255 area 0", "R3(config-router)#", "R3(config-router)#network 192.168.10.4 0.0.0.3 area 0", "R3(config-router)#", "R3(config-router)#network 192.168.10.8 0.0.0.3 area 0", "R3(config-router)#", "R3(config-router)#passive-interface GigabitEthernet0/0", "R3(config-router)#end", and "R3#". The prompt returns to "R3#". At the bottom of the terminal window, there are "Copy" and "Paste" buttons. Below the terminal window, there is a "Top" button.

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
Authorized Access Only!

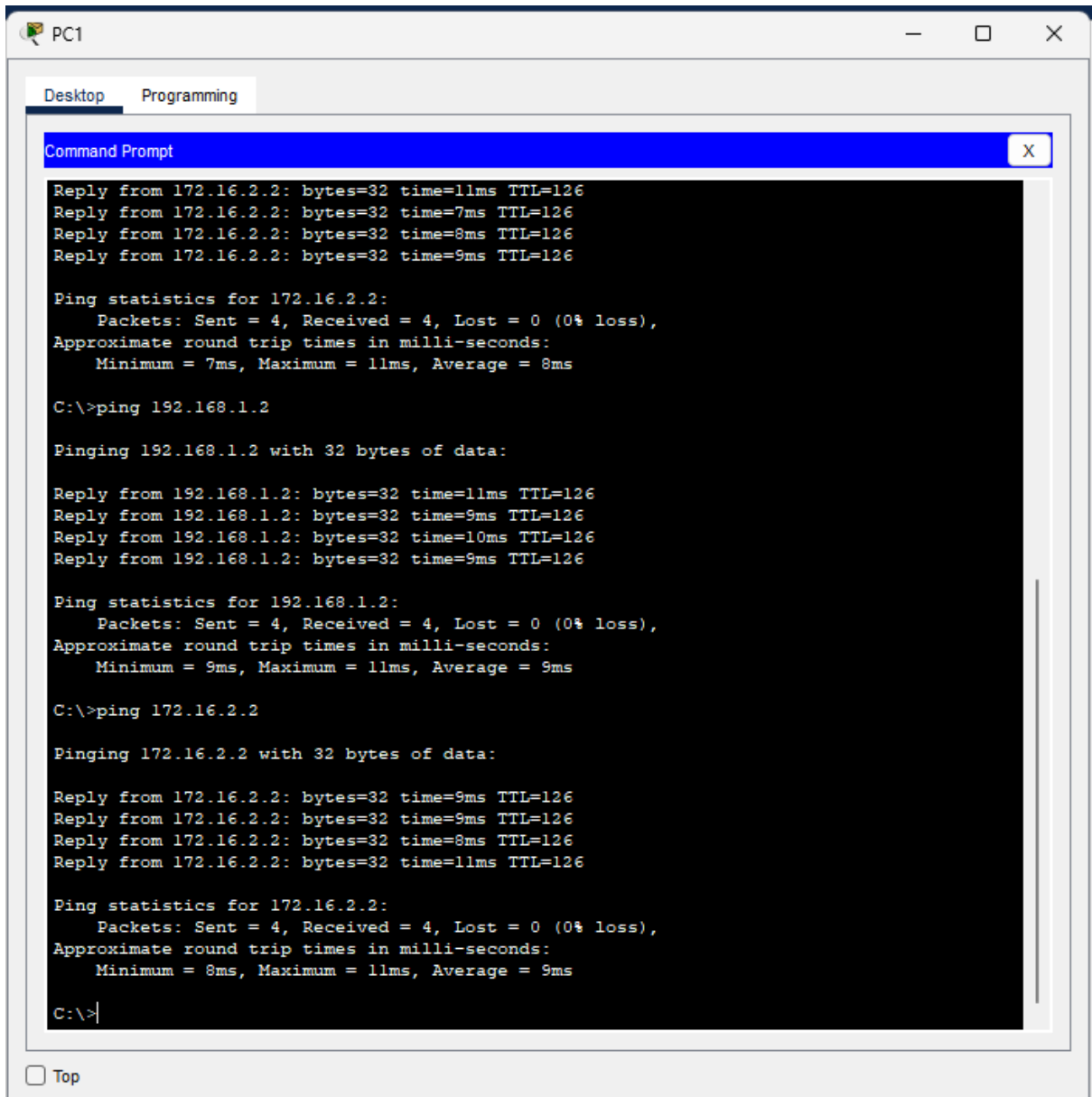
R3>en
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#
R3(config)#router ospf 10
R3(config-router)#
R3(config-router)#router-id 3.3.3.3
R3(config-router)#
R3(config-router)#network 192.168.1.0 0.0.0.255 area 0
R3(config-router)#
R3(config-router)#network 192.168.10.4 0.0.0.3 area 0
R3(config-router)#
10:46:54: %OSPF-5-ADJCHG: Process 10, Nbr 1.1.1.1 on Serial0/0/0 from LOADING to FULL,
Loading Done

R3(config-router)#network 192.168.10.8 0.0.0.3 area 0
R3(config-router)#
10:47:01: %OSPF-5-ADJCHG: Process 10, Nbr 2.2.2.2 on Serial0/0/1 from LOADING to FULL,
Loading Done

R3(config-router)#
R3(config-router)#passive-interface GigabitEthernet0/0
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#
```

8. Run the ping command from PC1 to check the connection.
- ping 192.168.1.2
  - ping 172.16.2.2



The screenshot shows a PC1 desktop environment with a 'Desktop' and 'Programming' tab. A 'Command Prompt' window is open, displaying the results of two ping tests. The first test is for 172.16.2.2, showing four successful replies with times ranging from 7ms to 11ms and a TTL of 126. The second test is for 192.168.1.2, also showing four successful replies with times ranging from 9ms to 11ms and a TTL of 126. Both tests show 0% packet loss.

```
PC1
Desktop Programming
Command Prompt
Reply from 172.16.2.2: bytes=32 time=11ms TTL=126
Reply from 172.16.2.2: bytes=32 time=7ms TTL=126
Reply from 172.16.2.2: bytes=32 time=8ms TTL=126
Reply from 172.16.2.2: bytes=32 time=9ms TTL=126

Ping statistics for 172.16.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 11ms, Average = 8ms

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=11ms TTL=126
Reply from 192.168.1.2: bytes=32 time=9ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=9ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 9ms, Maximum = 11ms, Average = 9ms

C:\>ping 172.16.2.2

Pinging 172.16.2.2 with 32 bytes of data:

Reply from 172.16.2.2: bytes=32 time=9ms TTL=126
Reply from 172.16.2.2: bytes=32 time=9ms TTL=126
Reply from 172.16.2.2: bytes=32 time=8ms TTL=126
Reply from 172.16.2.2: bytes=32 time=11ms TTL=126

Ping statistics for 172.16.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 8ms, Maximum = 11ms, Average = 9ms

C:\>|
```

## Conclusion

We have successfully configured single area OSPF using cisco packet tracer.