Project Name :-

Static Routing Configuration Lab – CCNA

- **Name :-**

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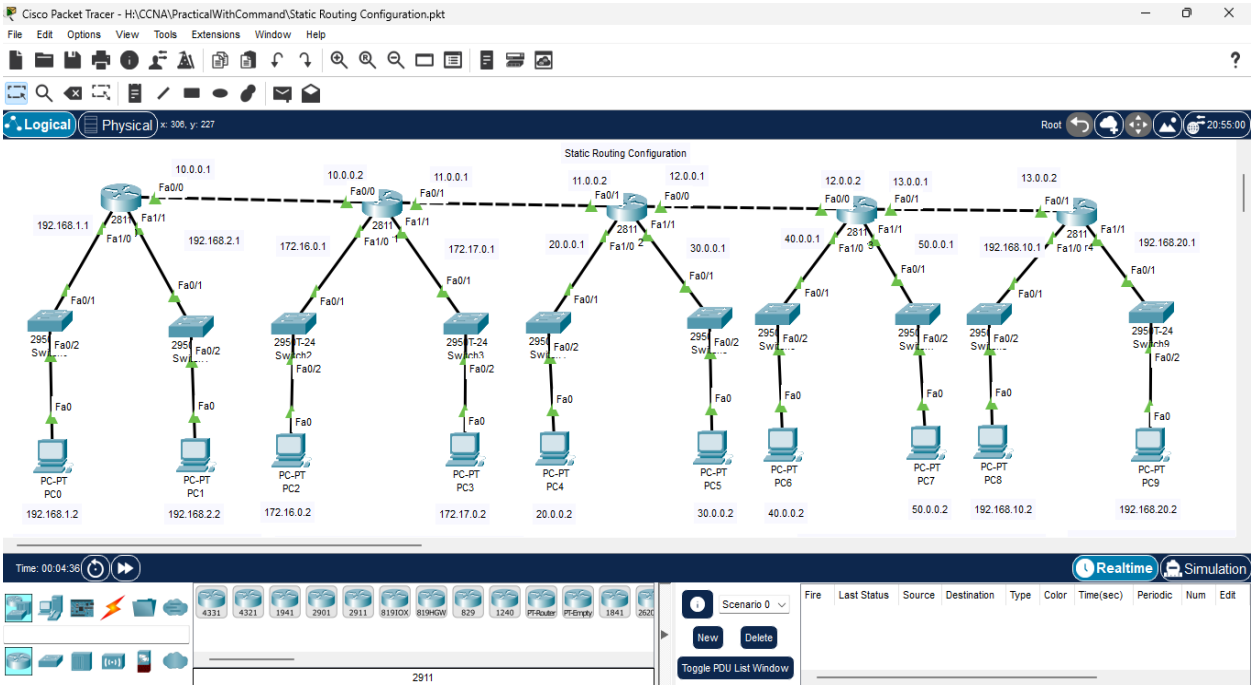
- **Objective / Purpose :-**

  Learn and implement static routing across multi-router topology.

- **Network Topology Diagram :-**



- **Lab Setup :-**

Router	Interfaces	IP Address	Subnet Mask	Description
R1	Fa 0/0	10.0.0.1	255.0.0.0	Connected to R2
	Fa 1/0	192.168.1.1	255.255.255.0	Connected to S1
	Fa 1/1	192.168.2.1	255.255.255.0	Connected to S2
R2	Fa 0/0	10.0.0.2	255.0.0.0	Connected to R1
	Fa 0/1	11.0.0.1	255.0.0.0	Connected to R3
	Fa 1/0	172.16.0.1	255.255.0.0	Connected to S3
	Fa 1/1	172.17.0.1	255.255.0.0	Connected to S4
R3	Fa 0/0	12.0.0.1	255.0.0.0	Connected to R4
	Fa 0/1	11.0.0.2	255.0.0.0	Connected to R2
	Fa 1/0	20.0.0.1	255.0.0.0	Connected to S5
	Fa 1/1	30.0.0.1	255.0.0.0	Connected to S6
R4	Fa 0/0	12.0.0.2	255.0.0.0	Connected to R3
	Fa 0/1	13.0.0.1	255.0.0.0	Connected to R5
	Fa 1/0	40.0.0.1	255.0.0.0	Connected to S7
	Fa 1/1	50.0.0.1	255.0.0.0	Connected to S8
R5	Fa 0/1	13.0.0.2	255.0.0.0	Connected to R4
	Fa 1/0	192.168.10.1	255.0.0.0	Connected to S9
	Fa 1/1	192.168.20.1	255.0.0.0	Connected to S10

- **Configuration Steps :-**

  -Configured IP addresses directly on router interfaces for each connected network.

  -Implemented static routes using the “ip route [network] [mask] [next-hop]” command to enable inter-network communication.

Router 1 :-

```
>enable
#configure terminal
(config)# hostname R1
R1(config)# ip route 172.16.0.0 255.255.0.0 10.0.0.2
R1 (config)# ip route 172.17.0.0 255.255.0.0 10.0.0.2
R1 (config)# ip route 20.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 30.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 40.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 50.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 11.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 12.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 13.0.0.0 255.0.0.0 10.0.0.2
R1 (config)# ip route 192.168.10.0 255.255.255.0 10.0.0.2
R1 (config)# ip route 192.168.20.0 255.255.255.0 10.0.0.2
```

Router 2 :-

```
>enable
#configure terminal
(config)# hostname R2
R2(config)# ip route 192.168.1.0 255.255.255.0 10.0.0.1
R2 (config)# ip route 192.168.2.0 255.255.255.0 10.0.0.1
R2 (config)# ip route 20.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 30.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 40.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 50.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 12.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 12.0.0.0 255.0.0.0 11.0.0.2
R2 (config)# ip route 192.168.10.0 255.255.255.0 12.0.0.2
R2 (config)# ip route 192.168.20.0 255.255.255.0 12.0.0.1
```

Router 3 :-

```
>enable
#configure terminal
(config)# hostname R3
R3 (config)# ip route 192.168.1.0 255.255.255.0 11.0.0.1
R3 (config)# ip route 192.168.2.0 255.255.255.0 11.0.0.1
R3 (config)# ip route 172.16.0.0 255.255.0.0 11.0.0.1
R3 (config)# ip route 172.17.0.0 255.255.0.0 11.0.0.1
R3 (config)# ip route 10.0.0.0 255.0.0.0 11.0.0.1
R3 (config)# ip route 40.0.0.0 255.0.0.0 12.0.0.2
R3 (config)# ip route 50.0.0.0 255.0.0.0 12.0.0.2
R3 (config)# ip route 192.168.10.0 255.255.255.0 12.0.0.2
R3 (config)# ip route 192.168.20.0 255.255.255.0 12.0.0.2
R3 (config)# ip route 13.0.0.0 255.0.0.0 12.0.0.2
```

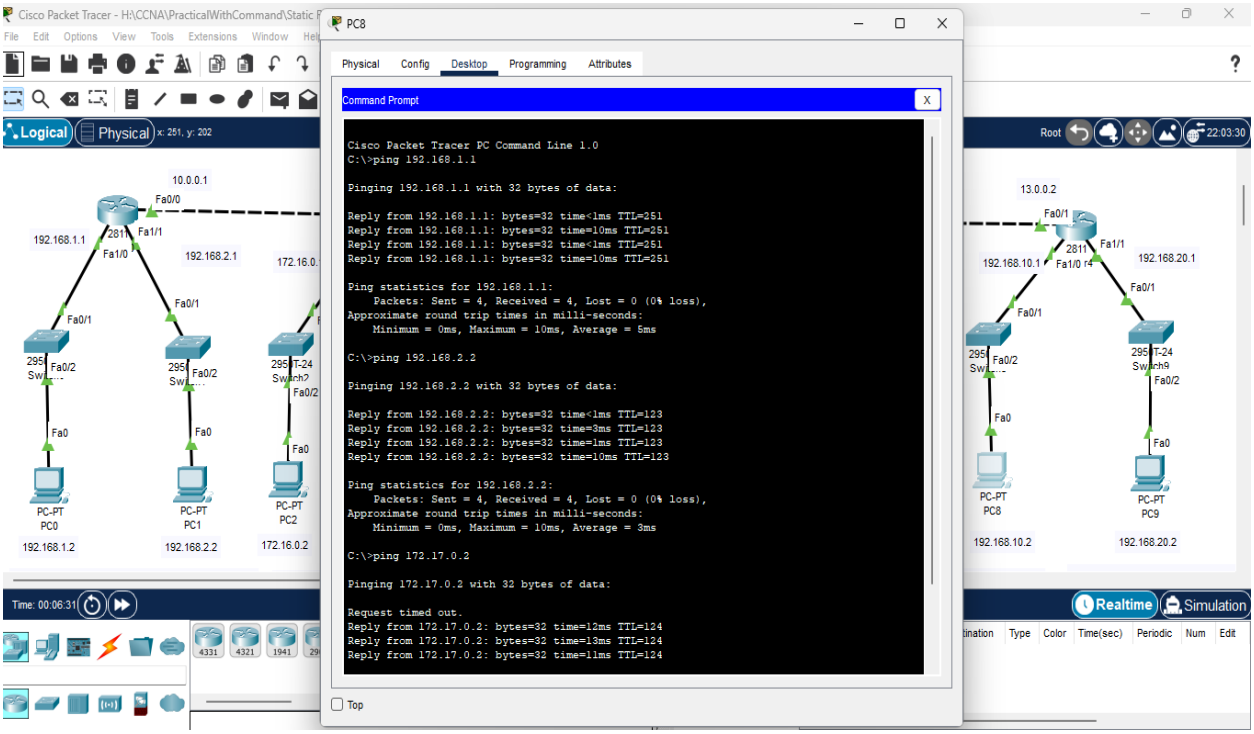
Router 4 :-

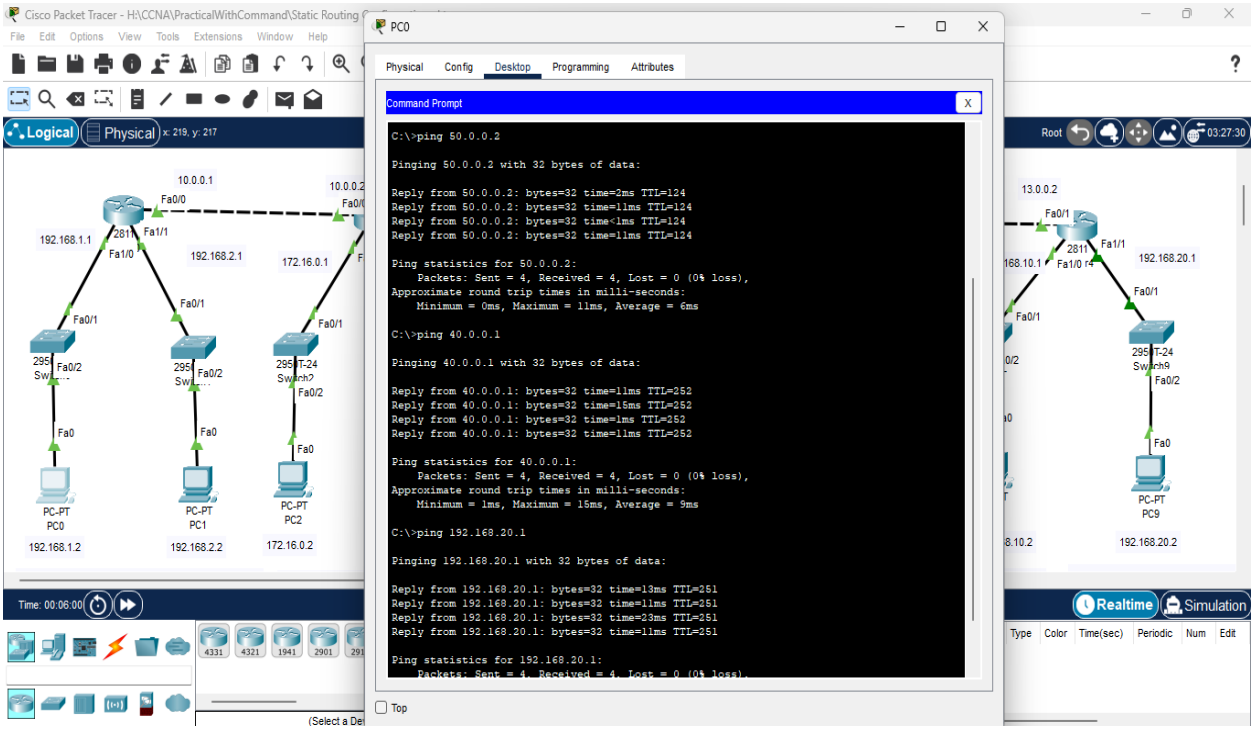
```
>enable
#configure terminal
(config)# hostname R4
R4 (config)# ip route 192.168.1.0 255.255.255.0 12.0.0.1
R4 (config)# ip route 192.168.2.0 255.255.255.0 12.0.0.1
R4 (config)# ip route 172.16.0.0 255.255.0.0 12.0.0.1
R4 (config)# ip route 172.17.0.0 255.255.0.0 12.0.0.1
R4 (config)# ip route 20.0.0.0 255.0.0.0 12.0.0.1
R4 (config)# ip route 30.0.0.0 255.0.0.0 12.0.0.1
R4 (config)# ip route 10.0.0.0 255.0.0.0 12.0.0.1
R4 (config)# ip route 11.0.0.0 255.0.0.0 12.0.0.1
R4 (config)# ip route 192.168.10.0 255.255.255.0 13.0.0.2
R4 (config)# ip route 192.168.20.0 255.255.255.0 13.0.0.2
```

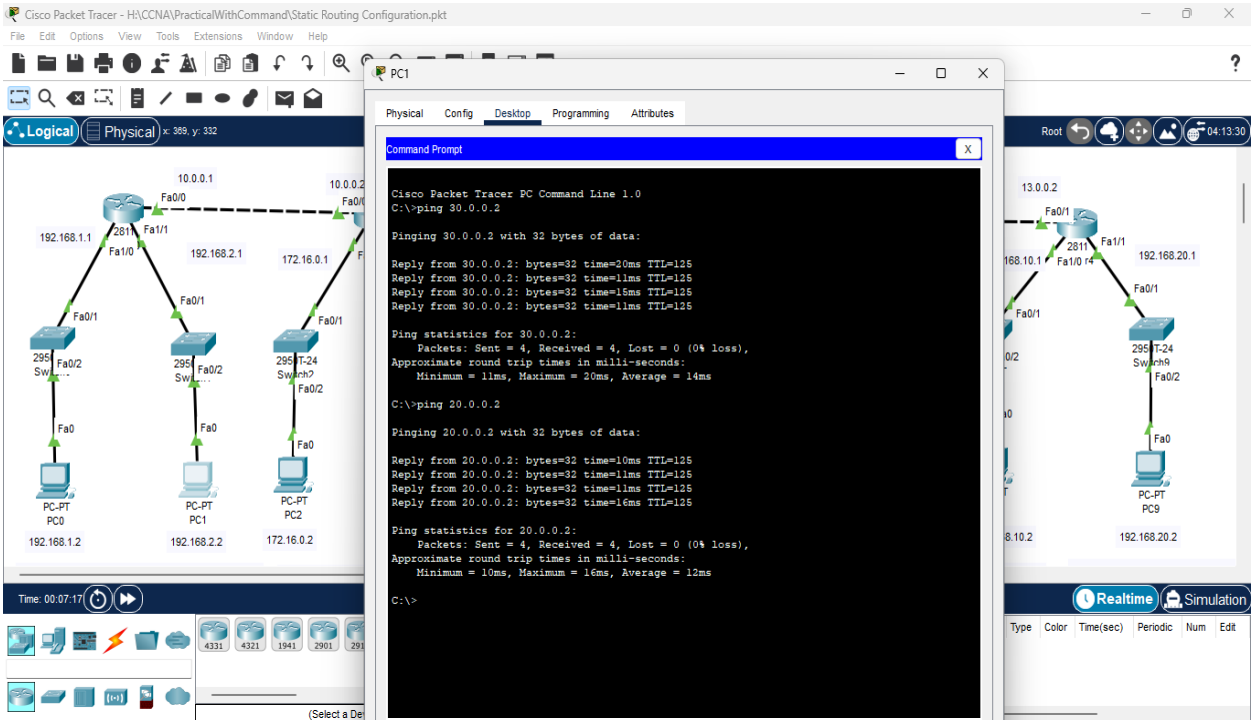
Router 5 :-

```
>enable
#configure terminal
(config)# hostname R5
R5 (config)# ip route 192.168.1.0 255.255.255.0 13.0.0.1
R5 (config)# ip route 192.168.2.0 255.255.255.0 13.0.0.1
R5 (config)# ip route 172.16.0.0 255.255.0.0 13.0.0.1
R5 (config)# ip route 172.17.0.0 255.255.0.0 13.0.0.1
R5 (config)# ip route 20.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 30.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 40.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 50.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 10.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 11.0.0.0 255.0.0.0 13.0.0.1
R5 (config)# ip route 12.0.0.0 255.0.0.0 13.0.0.
```

- **Ping Test Section :-**






Cisco Packet Tracer - H:\CCNA\PracticalWithCommand\Static Routing Configuration.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
PC1
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 30.0.0.2
Pinging 30.0.0.2 with 32 bytes of data:
Reply from 30.0.0.2: bytes=32 time=20ms TTL=125
Reply from 30.0.0.2: bytes=32 time=11ms TTL=125
Reply from 30.0.0.2: bytes=32 time=15ms TTL=125
Reply from 30.0.0.2: bytes=32 time=11ms TTL=125
Ping statistics for 30.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 11ms, Maximum = 20ms, Average = 14ms
C:\>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:
Reply from 20.0.0.2: bytes=32 time=10ms TTL=125
Reply from 20.0.0.2: bytes=32 time=11ms TTL=125
Reply from 20.0.0.2: bytes=32 time=11ms TTL=125
Reply from 20.0.0.2: bytes=32 time=16ms TTL=125
Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 10ms, Maximum = 16ms, Average = 12ms
C:\>
10.0.0.1
192.168.1.1
192.168.2.1
172.16.0.1
PC-PT PC0
PC-PT PC1
PC-PT PC2
192.168.1.2
192.168.2.2
172.16.0.2
13.0.0.2
192.168.20.1
PC-PT PC9
192.168.20.2
Realtime
Simulation

- **Obeservations :-**

    1. Successfully configured static routes between all routers.
    2. Static routing works well for small networks.
    3. Ping test confirmed end-to-end connectivity.

- **Challenges / Troubleshooting :-**

    1. Some ping tests initially failed → resolved by verifying next-hop Ips.
    2. Keeping track of multiple routes for multi-router topology required careful planning.