

Project Name

Static Routing

Configuration Lab –

CCNA

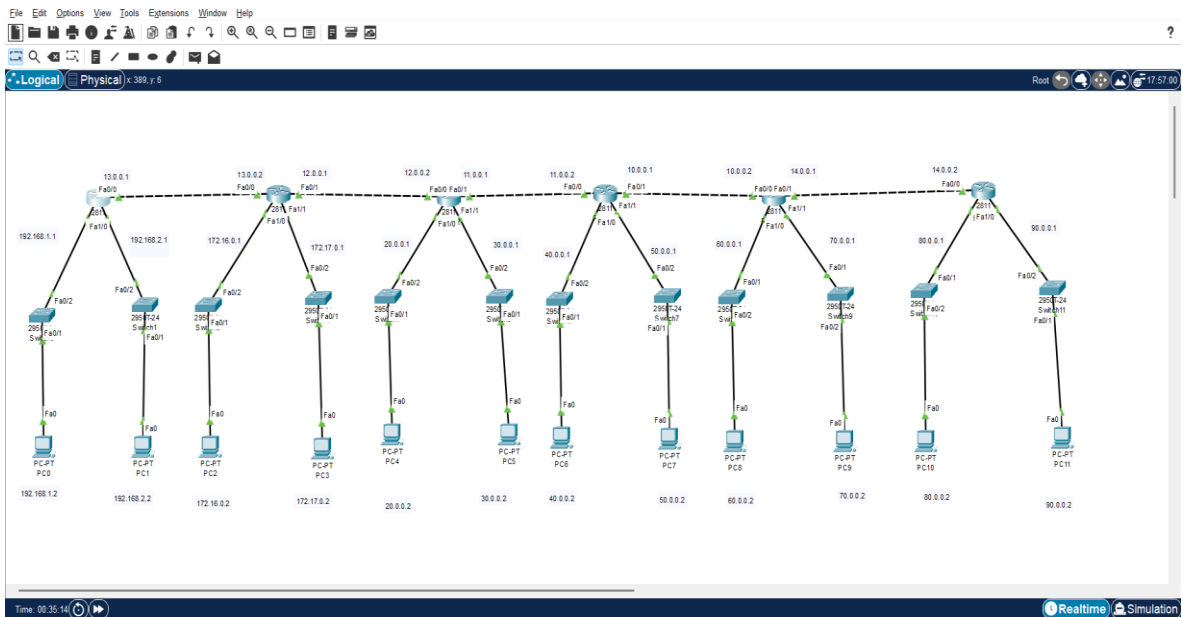
- **Name :-**

Pavan Nanaso Pawar

- **Objective / Purpose :-**

Learn and implement static routing across multi-router topology.

• Network Topology Diagram :-



• Lab Setup

Router	Interface	Ip Address	Subnet Mask	Description
R1	Fa 0/0	13.0.0.1	255.0.0.0	Connected to R2
	Fa 1/0	192.168.2.0	255.255.255.0	Connected to S2
	Fa 0/1	192.168.1.0	255.255.255.0	Connected to S1
R2	Fa 0/0	13.0.0.1	255.0.0.0	Connected to R1
	Fa 0/1	12.0.0.1	255.0.0.0	Connected to R3
	Fa 1/0	172.16.0.1	255.255.0.0	Connected to S1
	Fa 1/1	172.17.0.1	255.255.0.0	Connected to S2
R3	Fa 0/0	12.0.0.2	255.0.0.0	Connected to R2
	Fa 0/1	11.0.0.1	255.0.0.0	Connected to R4
	Fa 1/0	20.0.0.1	255.0.0.0	Connected to S1
	Fa 1/1	30.0.0.1	255.0.0.0	Connected to S2
R4	Fa 0/0	11.0.0.2	255.0.0.0	Connected to R3
	Fa 0/1	10.0.0.1	255.0.0.0	Connected to R5
	Fa 1/0	40.0.0.1	255.0.0.0	Connected to S1
	Fa 0/0	50.0.0.1	255.0.0.0	Connected to S2
R5	Fa 0/0	10.0.0.2	255.0.0.0	Connected to R4
	Fa 0/1	14.0.0.1	255.0.0.0	Connected to R6
	Fa 1/0	60.0.0.1	255.0.0.0	Connected to S1
	Fa 1/1	70.0.0.1	255.0.0.0	Connected to S2
R6	Fa 0/0	14.0.0.2	255.0.0.0	Connected to R5
	Fa 0/1	80.0.0.1	255.0.0.0	Connected to S1
	Fa 1/0	90.0.0.1	255.0.0.0	Connected to S2

- **Configuration Step:-**

- 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 13.0.0.2
```

```
R1(config)# ip route 172.17.0.0 255.255.0.0 13.0.0.2
```

```
R1(config)# ip route 20.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 30.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 40.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 50.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 60.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 70.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 80.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 90.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 12.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 11.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 10.0.0.0 255.0.0.0 13.0.0.2
```

```
R1(config)# ip route 14.0.0.0 255.0.0.0 13.0.0.2
```

- **Router 2 :-**

```
>enable
#configure terminal
(config)# hostname R1
R1(config)# ip route 192.168.1.0 255.255.255.0 10.0.0.1
R1(config)# ip route 192.168.2.0 255.255.255.0 10.0.0.1
R1(config)# ip route 20.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 30.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 40.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 50.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 60.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 70.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 80.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 90.0.0.0 255.0.0.0 12.0.0.2
R1(config)# ip route 11.0.0.0 255.0.0.0 12.0.0.2
```

Router 3 :-

```
>enable
```

```
#configure terminal
```

```
(config)# hostname R1
```

```
R1(config)# ip route 192.168.1.0 255.255.255.0 12.0.0.1
```

```
R1(config)# ip route 192.168.2.0 255.255.255.0 12.0.0.1
```

```
R1(config)# ip route 172.16.0.0 255.255.0.0 12.0.0.1
```

```
R1(config)# ip route 172.17.0.0 255.255.0.0 12.0.0.1
```

```
R1(config)# ip route 13.0.0.0 255.0.0.0 12.0.0.1
```

```
R1(config)# ip route 40.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 50.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 60.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 70.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 80.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 90.0.0.0 255.0.0.0 11.0.0.2
```

```
R1(config)# ip route 14.0.0.0 255.0.0.0 11.0.0.2
```

Router 4 :-

```
>enable
#configure terminal
(config)# hostname R1
R1(config)# ip route 192.168.1.0 255.255.255.0 11.0.0.1
R1(config)# ip route 192.168.2.0 255.255.255.0 11.0.0.1
R1(config)# ip route 172.16.0.0 255.255.0.0 11.0.0.1
R1(config)# ip route 172.17.0.0 255.255.0.0 11.0.0.1
R1(config)# ip route 20.0.0.0 255.0.0.0 11.0.0.1
R1(config)# ip route 30.0.0.0 255.0.0.0 11.0.0.1
R1(config)# ip route 60.0.0.0 255.0.0.0 10.0.0.2
R1(config)# ip route 70.0.0.0 255.0.0.0 10.0.0.2
R1(config)# ip route 80.0.0.0 255.0.0.0 10.0.0.2
R1(config)# ip route 90.0.0.0 255.0.0.0 10.0.0.2
```


Router 5:-

>enable

#configure terminal

(config)# hostname R1

R1(config)# ip route 192.168.1.0 255.255.255.0 10.0.0.1

R1(config)# ip route 192.168.2.0 255.255.255.0 10.0.0.1

R1(config)# ip route 172.16.0.0 255.255.0.0 10.0.0.1

R1(config)# ip route 172.17.0.0 255.255.0.0 10.0.0.1

R1(config)# ip route 20.0.0.0 255.0.0.0 10.0.0.1

R1(config)# ip route 30.0.0.0 255.0.0.0 10.0.0.1

R1(config)# ip route 40.0.0.0 255.0.0.0 10.0.0.1

R1(config)# ip route 50.0.0.0 255.0.0.0 10.0.0.1

R1(config)# ip route 80.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 90.0.0.0 255.0.0.0 14.0.0.1

Router 6:-

>enable

#configure terminal

(config)# hostname R1

R1(config)# ip route 192.168.1.0 255.255.255.0 14.0.0.1

R1(config)# ip route 192.168.2.0 255.255.255.0 14.0.0.1

R1(config)# ip route 172.16.0.0 255.255.0.0 14.0.0.1

R1(config)# ip route 172.17.0.0 255.255.0.0 14.0.0.1

R1(config)# ip route 20.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 30.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 40.0.0.0 255.0.0.0 14.0.0.1

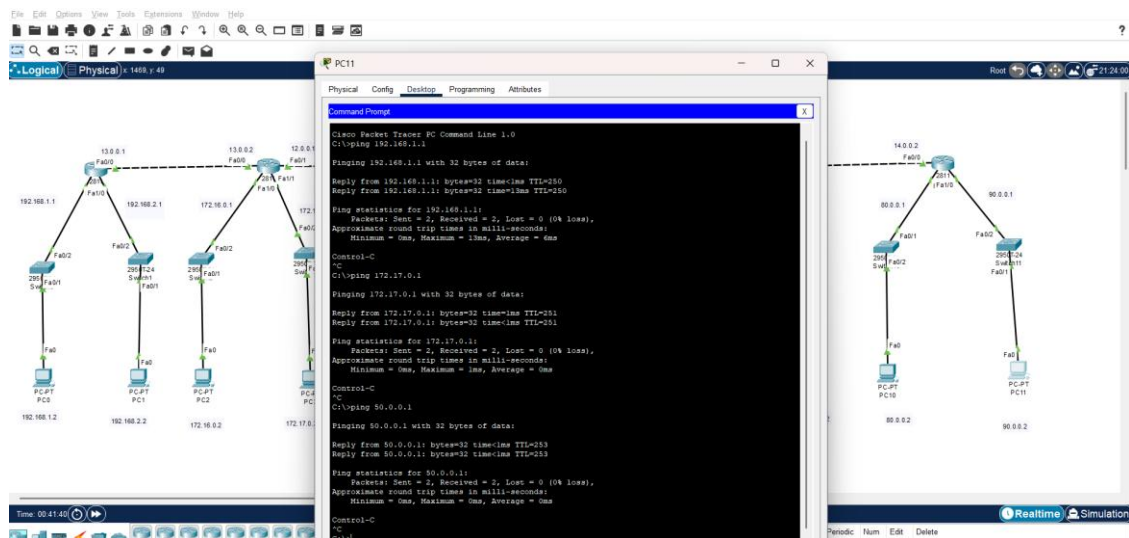
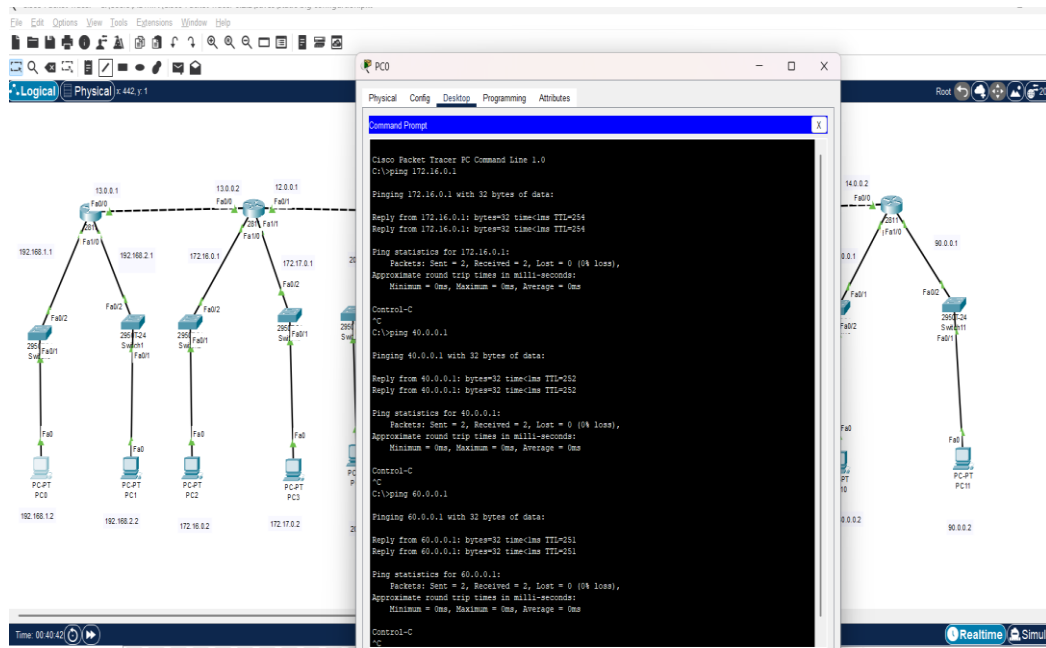
R1(config)# ip route 50.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 60.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 70.0.0.0 255.0.0.0 14.0.0.1

R1(config)# ip route 10.0.0.0 255.0.0.0 14.0.0.1

- Ping Test section:-



The image displays the Cisco Packet Tracer software interface. On the left, a network diagram shows three switches (S1, S2, S3) connected in a triangle topology. S1 is connected to S2 and S3. S2 is connected to S1 and S3. S3 is connected to S1 and S2. Each switch has several interfaces connected to PCs and other devices. The central window shows a command prompt for PC6, displaying the results of several ping commands. The right window shows a detailed network topology diagram with various devices and their connections.

Command Prompt Output:

```

C:\>ping 70.0.0.1
Pinging 70.0.0.1 with 32 bytes of data:
Reply from 70.0.0.1: bytes=32 time=1ms TTL=254
Reply from 70.0.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 70.0.0.1:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

Control-C
^C
C:\>ping 90.0.0.1
Pinging 90.0.0.1 with 32 bytes of data:
Reply from 90.0.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 90.0.0.1:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

Control-C
^C
C:\>ping 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=1ms TTL=252

Ping statistics for 192.168.1.1:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

Control-C
^C
C:\>

```

- **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.