NETWORKING ASSIGNMENT-3

Cisco tracer lab assignments

Lab Objective:

To configure static routing on a network with four routers, four switches, and eight PCs using Cisco Packet Tracer.

Equipment Required:

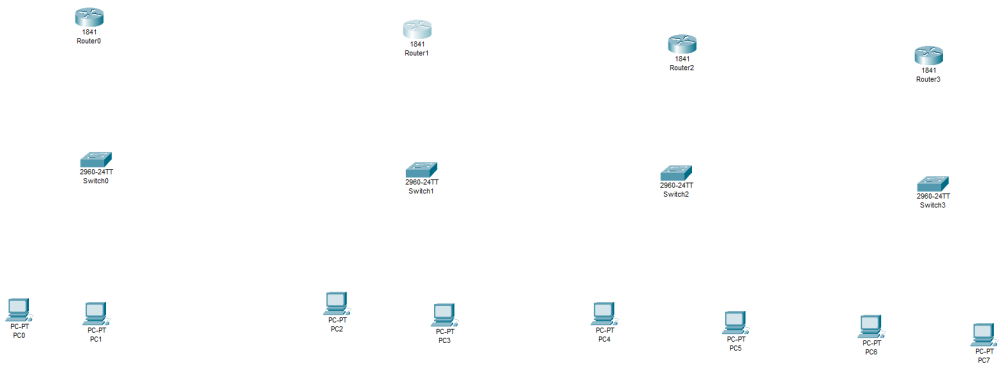
- 4 Routers
- 4 Switches (2960)
- 8 PCs
- Copper Straight-Through and Serial Cables

Network Configuration Steps:

Step 1: Set Up the Network Topology

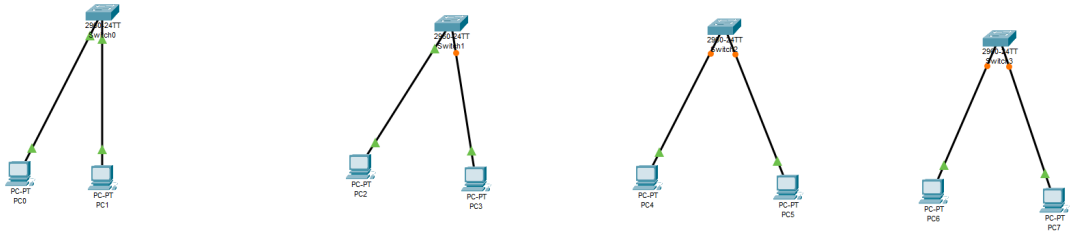
Add Devices to the Workspace:

1. Drag and drop four routers and four switches into the Cisco Packet Tracer workspace.
2. Add eight PCs, naming them PC1 to PC8.



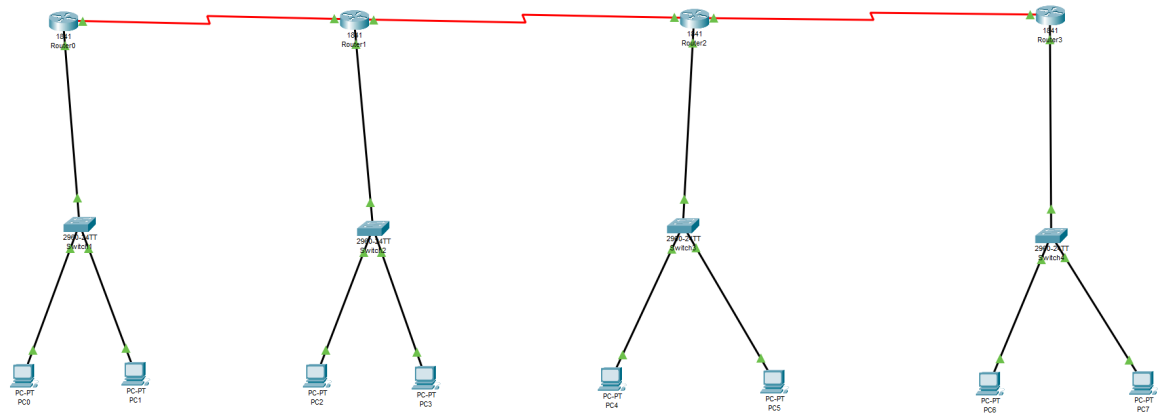
Connect Devices Using Copper Straight-Through Cables:

1. Connect the following devices:
    - PC1 and PC2 to Switch-0
    - PC3 and PC4 to Switch-1
    - PC5 and PC6 to Switch-2
    - PC7 and PC8 to Switch-3
2. Connect each switch to its corresponding router's GigabitEthernet port.



Connect Routers Using Serial Cables:

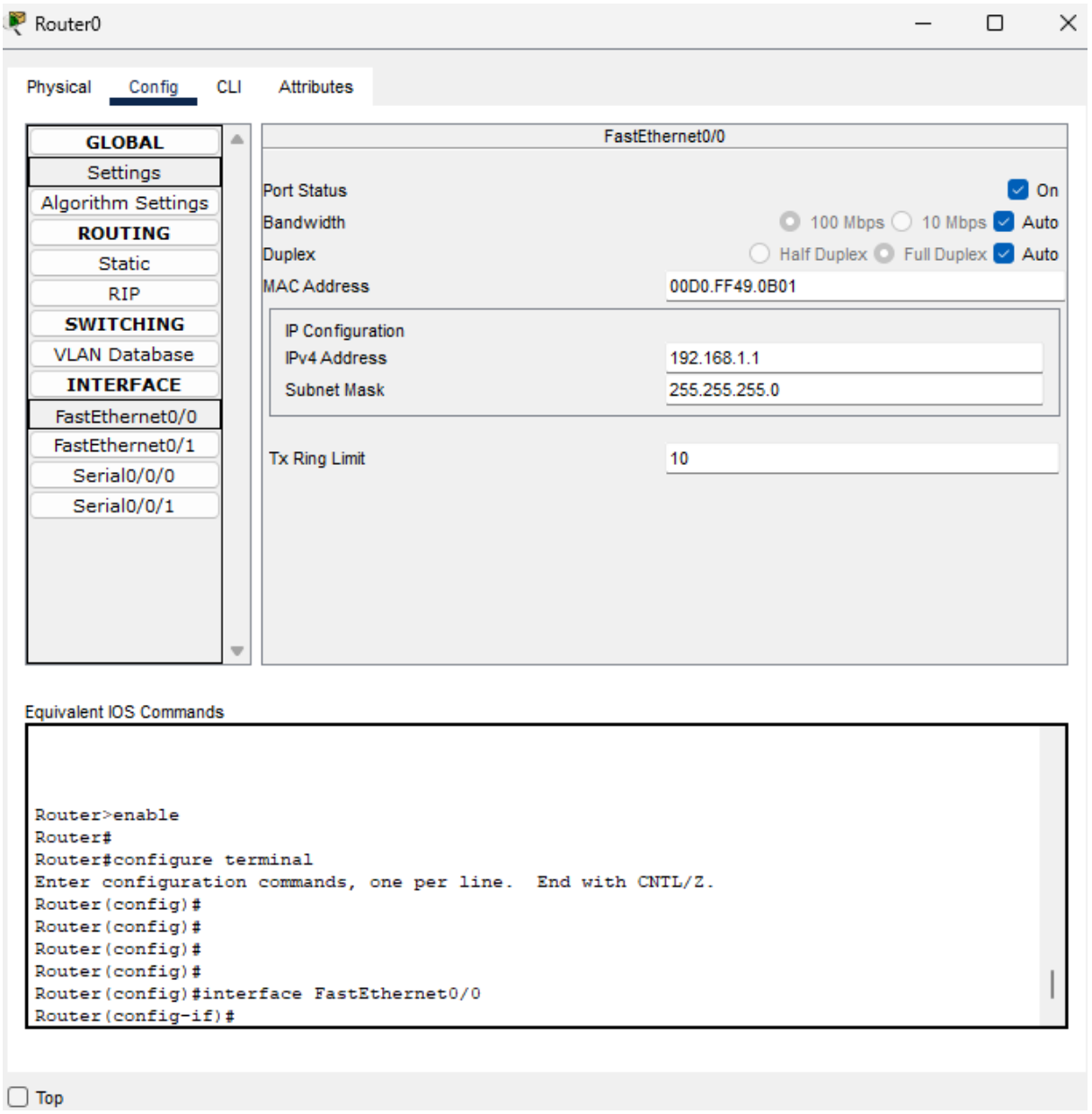
1. Use Serial DCE cables to connect the routers in the following configuration:
    - Router 1 to Router 2
    - Router 2 to Router 3
    - Router 3 to Router 4
    - Optionally, Router 4 back to Router 1 (for a loop)



Step 2: Assign IP Addresses

Assign IP Addresses to Routers:

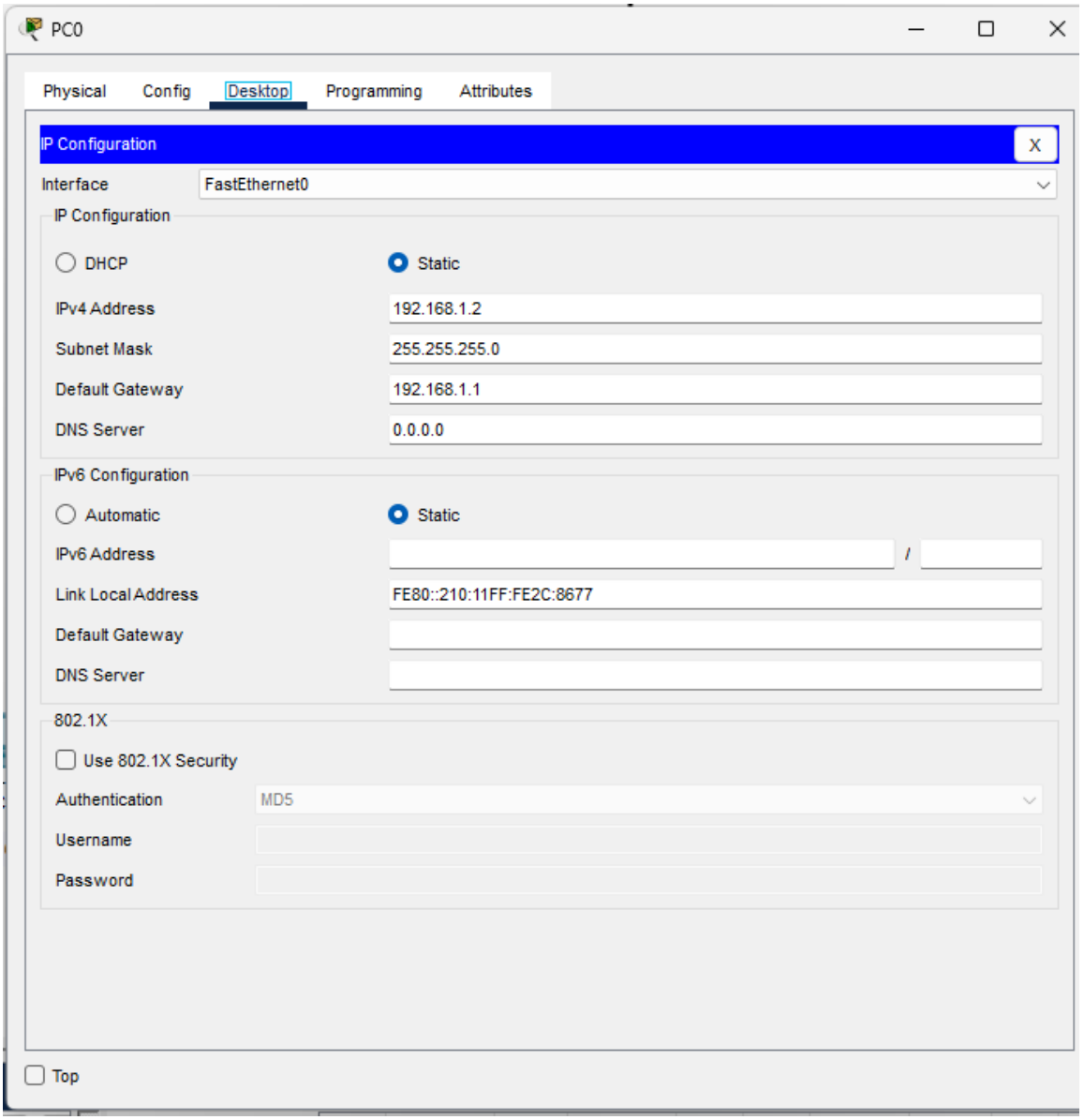
1. **Router 1:**
   - Interface G0/0: 192.168.1.1/24
   - Serial 0/0/0: 11.0.0.1/30 (connect to Router 2)
2. **Router 2:**
   - Interface G0/0: 192.168.2.1/24
   - Serial 0/0/0: 11.0.0.2/30 (connect to Router 1)
   - Serial 0/0/1: 12.0.0.1/30 (connect to Router 3)
3. **Router 3:**
   - Interface G0/0: 192.168.3.1/24
   - Serial 0/0/0: 12.0.0.2/30 (connect to Router 2)
   - Serial 0/0/1: 13.0.0.1/30 (connect to Router 4)
4. **Router 4:**
   - Interface G0/0: 192.168.4.1/24
   - Serial 0/0/0: 13.0.0.2/30 (connect to Router 3)
   - Optionally, Serial 0/0/1: 11.0.0.3/30 (connect to Router 1)



Assign IP Addresses to PCs:

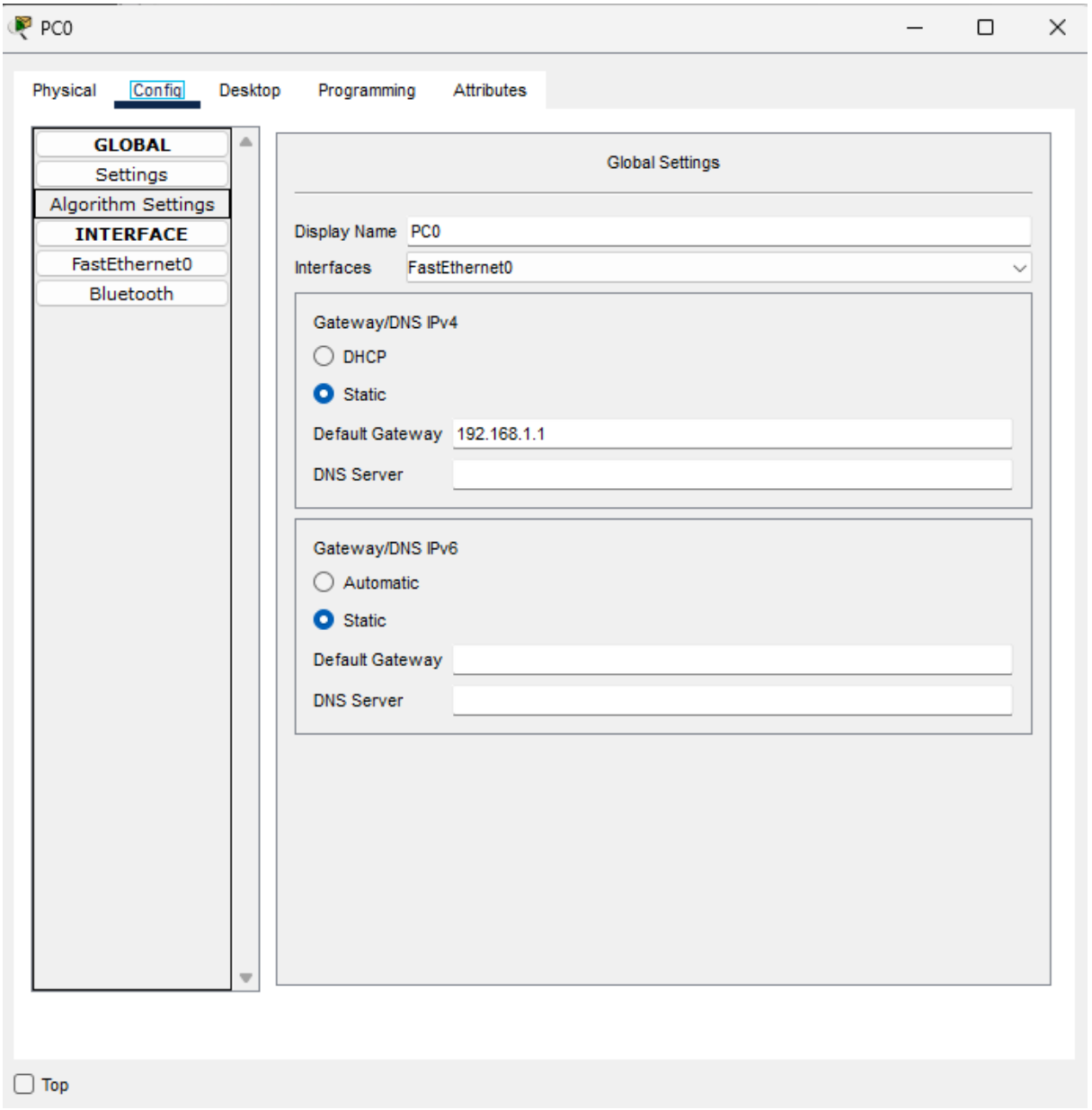
- **PC1**: 192.168.1.2/24, Default Gateway 192.168.1.1
- **PC2**: 192.168.1.3/24, Default Gateway 192.168.1.1
- **PC3**: 192.168.2.2/24, Default Gateway 192.168.2.1
- **PC4**: 192.168.2.3/24, Default Gateway 192.168.2.1
- **PC5**: 192.168.3.2/24, Default Gateway 192.168.3.1
- **PC6**: 192.168.3.3/24, Default Gateway 192.168.3.1
- **PC7**: 192.168.4.2/24, Default Gateway 192.168.4.1

- **PC8**: 192.168.4.3/24, Default Gateway 192.168.4.1



Step 3: Assign Default Gateways to PCs:

1. **PC1 & PC2**: Default Gateway 192.168.1.1
2. **PC3 & PC4**: Default Gateway 192.168.2.1
3. **PC5 & PC6**: Default Gateway 192.168.3.1
4. **PC7 & PC8**: Default Gateway 192.168.4.1



Step 4: Configure Static Routing on Routers

Router 0 Configuration (Router 1)

Configure the static routes on Router 1 (Router 0) to route traffic between different subnets and across the network.

```
plaintext
Copy code
Router0(config)# ip route 192.168.2.0 255.255.255.0 11.0.0.
2
Router0(config)# ip route 192.168.3.0 255.255.255.0 12.0.0.
```

```
2
Router0(config)# ip route 192.168.4.0 255.255.255.0 13.0.0.
2
Router0(config)# ip route 12.0.0.0 255.0.0.0 11.0.0.2
Router0(config)# ip route 13.0.0.0 255.0.0.0 12.0.0.2
```

Router 1 Configuration (Router 2)

```
Router1(config)# ip route 192.168.1.0 255.255.255.0 11.0.0.
1
Router1(config)# ip route 192.168.3.0 255.255.255.0 12.0.0.
3
Router1(config)# ip route 192.168.4.0 255.255.255.0 12.0.0.
3
Router1(config)# ip route 13.0.0.0 255.0.0.0 12.0.0.3
```

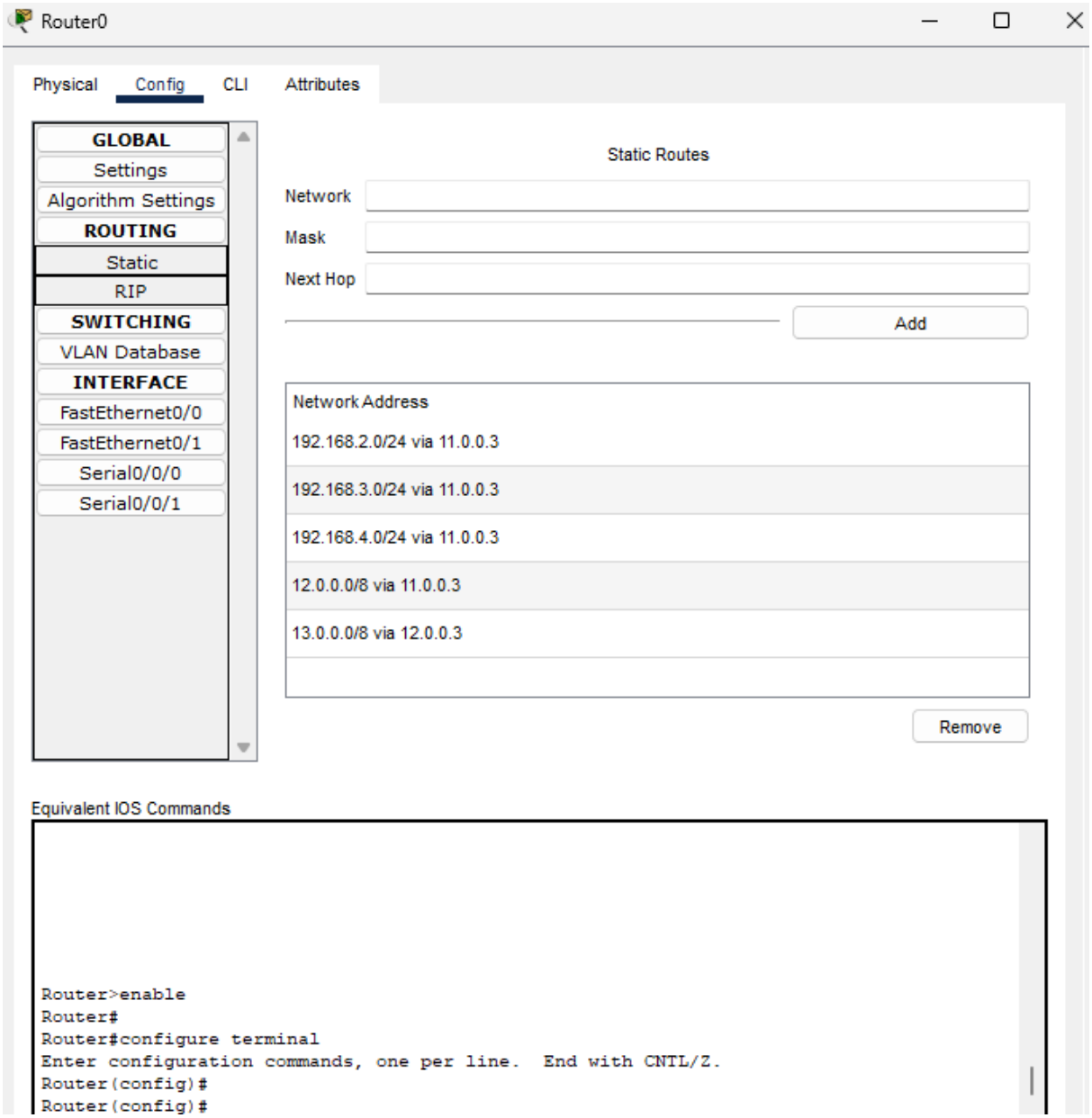
Router 2 Configuration (Router 3)

```
Router2(config)# ip route 192.168.1.0 255.255.255.0 12.0.0.
1
Router2(config)# ip route 192.168.2.0 255.255.255.0 12.0.0.
1
Router2(config)# ip route 192.168.4.0 255.255.255.0 13.0.0.
3
Router2(config)# ip route 11.0.0.0 255.255.255.252 12.0.0.1
```

Router 3 Configuration (Router 4)

```
Router3(config)# ip route 192.168.1.0 255.255.255.0 13.0.0.
1
Router3(config)# ip route 192.168.2.0 255.255.255.0 13.0.0.
```

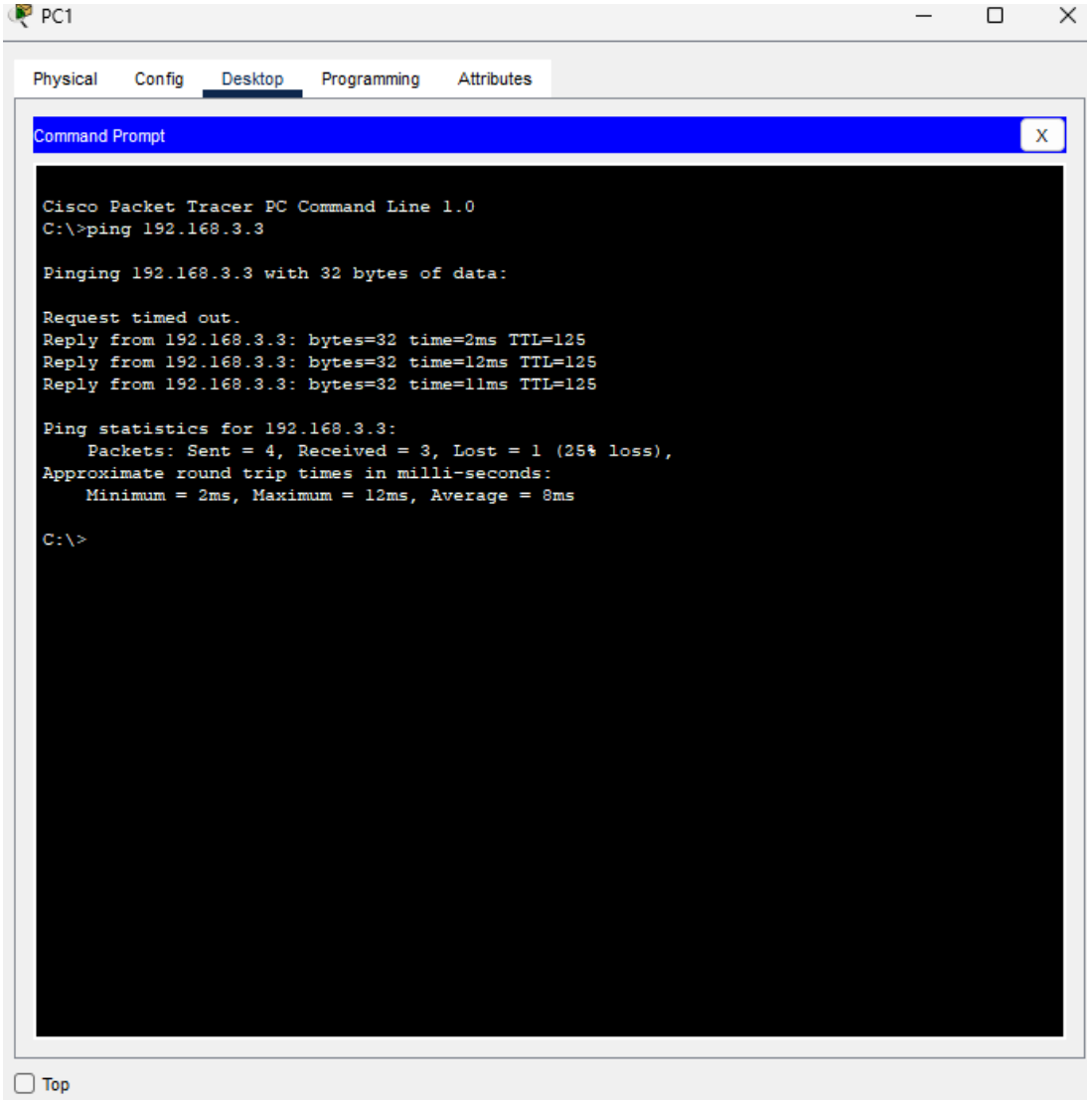
```
1
Router3(config)# ip route 192.168.3.0 255.255.255.0 13.0.0.
1
Router3(config)# ip route 11.0.0.0 255.255.255.252 13.0.0.1
```



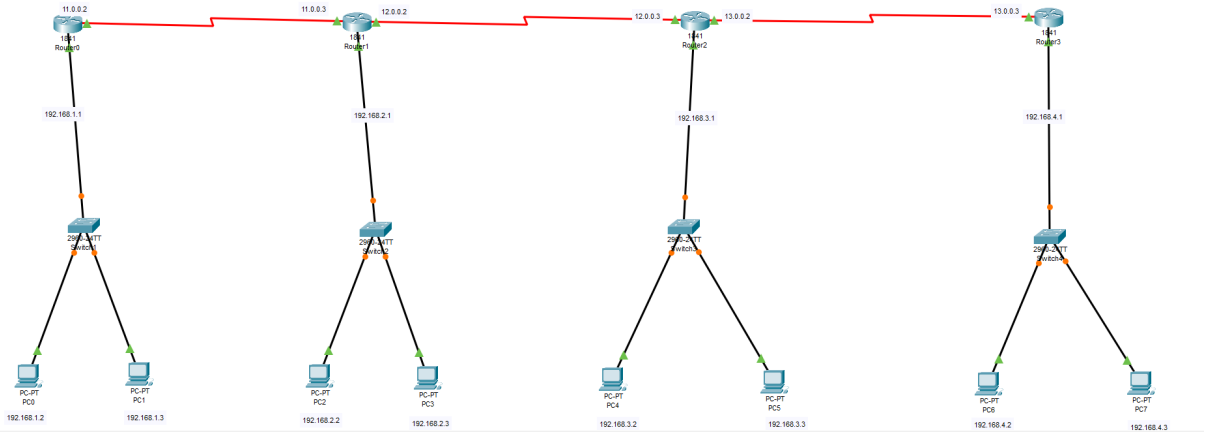
Step 5: Verify Connectivity

1. **Ping Tests:**

- After configuring static routes, test the connectivity between PCs on different networks using **ping**.
- Example: Ping from **PC1** to **PC5** to verify communication across routers.



Final Look



Conclusion:

This lab successfully configured static routing across four routers, allowing PCs from different subnets to communicate with each other. The process demonstrated the importance of static routing in directing traffic between different networks and provided a foundational understanding of routing, IP addressing, and subnetting.

Created By: Suvendu Das