

CN LAB Detailed Procedures

Lab 1: Introduction to Packet Tracer, Peer-to-Peer Communication, Study of Cables and its Color Codes

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.
- Familiarize yourself with the interface, including the workspace, device selection, and tools.

2. **Create a Simple Network:**

- Drag two computers (PC-PT) onto the workspace.
- Drag a switch (Switch-PT) onto the workspace.
- Connect each computer to the switch using straight-through Ethernet cables.

3. **Configure IP Addresses:**

- Click on the first computer, go to the Desktop tab, and select IP Configuration.
- Assign an IP address (e.g., 192.168.1.1) and a subnet mask (e.g., 255.255.255.0).
- Click on the second computer, go to the Desktop tab, and select IP Configuration.
- Assign an IP address (e.g., 192.168.1.2) and a subnet mask (e.g., 255.255.255.0).

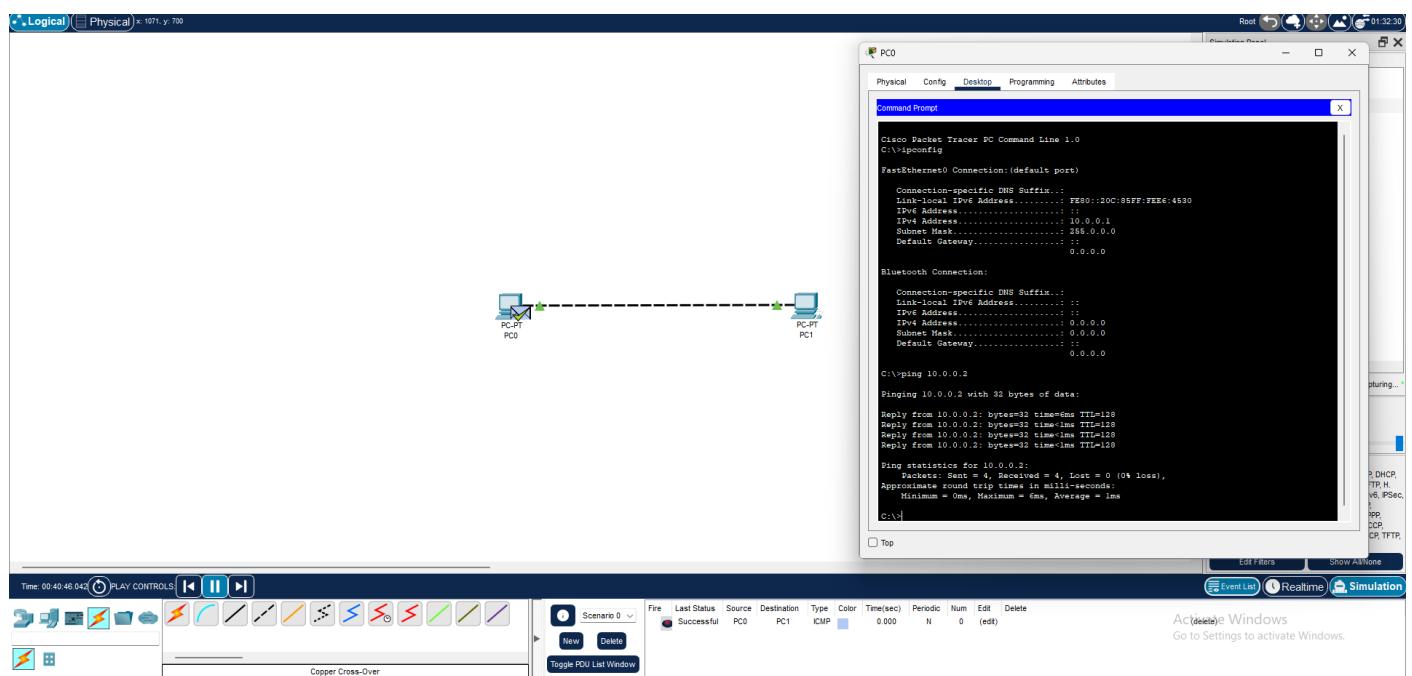
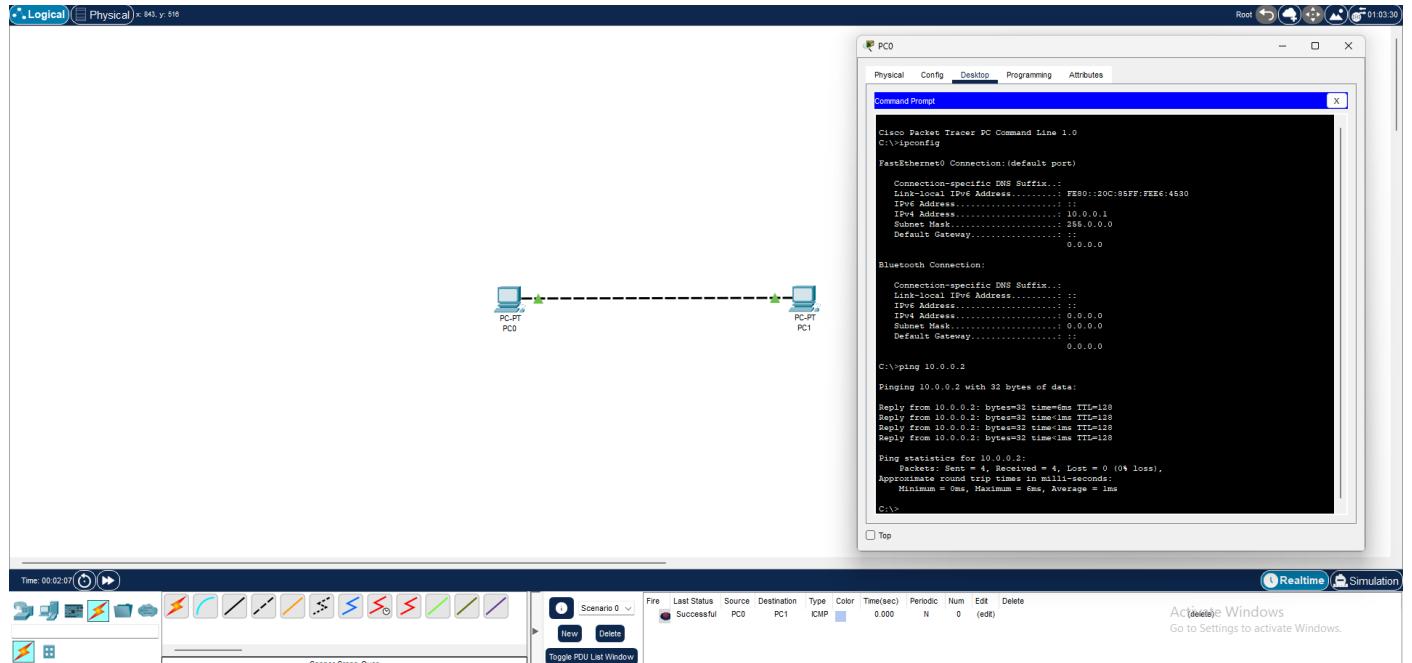
4. **Test Peer-to-Peer Communication:**

- On the first computer, open the Command Prompt from the Desktop tab.
- Use the `ping` command to test connectivity to the second computer (e.g., `ping 192.168.1.2`).
- Observe the response to ensure the computers can communicate.

5. **Study Cables and Color Codes:**

- Examine different types of network cables provided (Ethernet, crossover).
- Note the color codes for each wire in the cables:
 - Straight-through cable (used to connect different devices like a computer to a switch).
 - Crossover cable (used to connect similar devices like computer to computer).

Output:



Lab 2: Implementation of Network Topologies

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Implement a Bus Topology:**

- Drag three computers onto the workspace.
- Connect them using a single backbone cable (Coaxial Cable).

3. **Implement a Star Topology:**

- Drag three computers and a switch onto the workspace.
- Connect each computer to the switch using straight-through Ethernet cables.

4. **Implement a Ring Topology:**

- Drag three computers onto the workspace.
- Connect them in a circular manner using crossover cables.

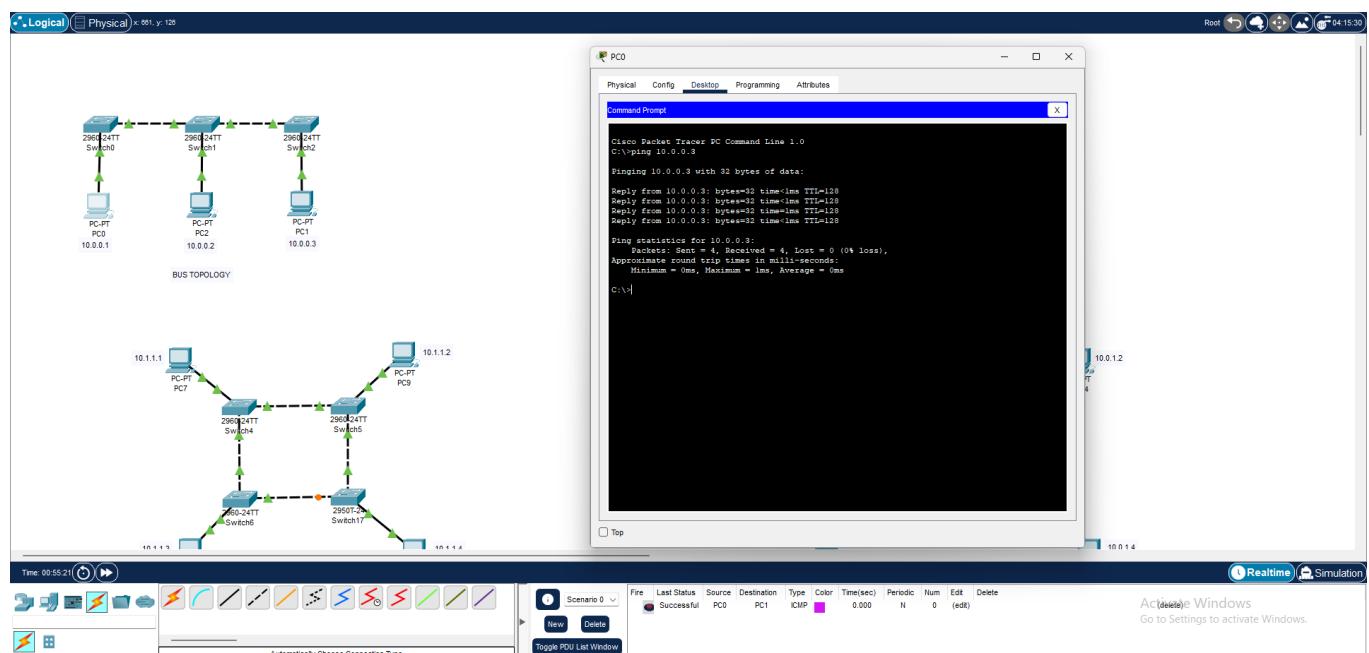
5. **Implement a Mesh Topology:**

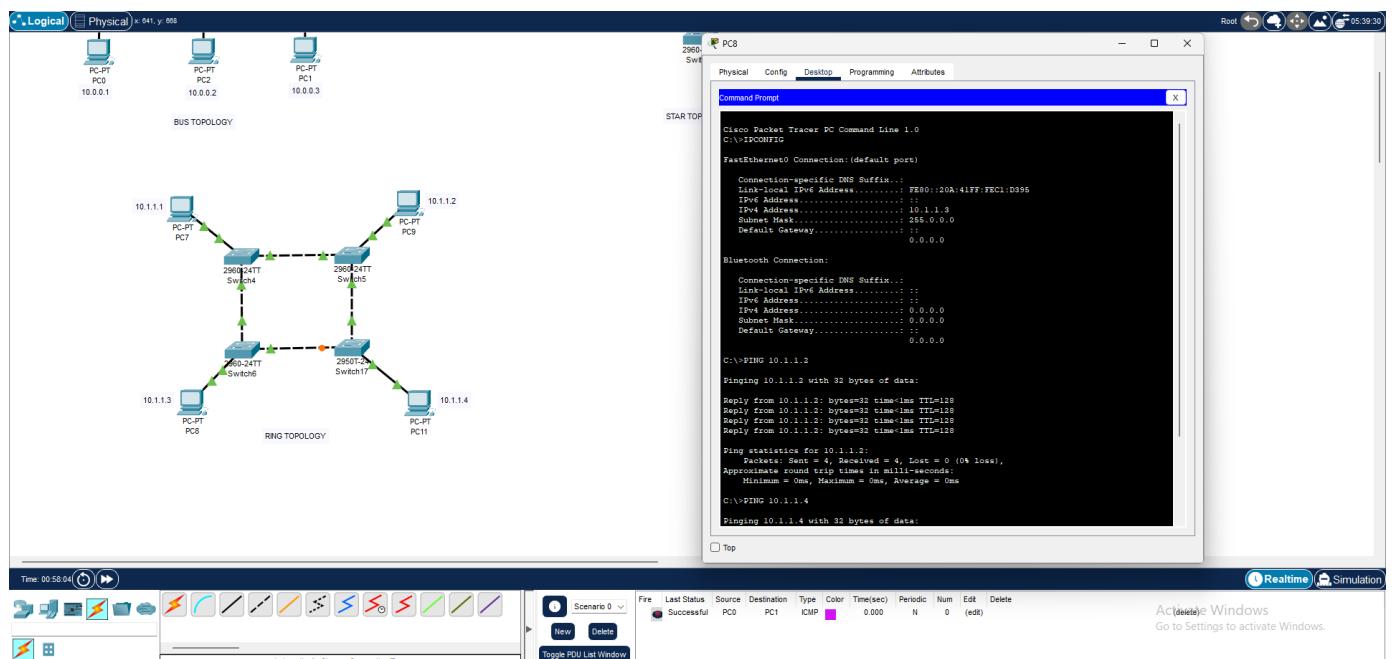
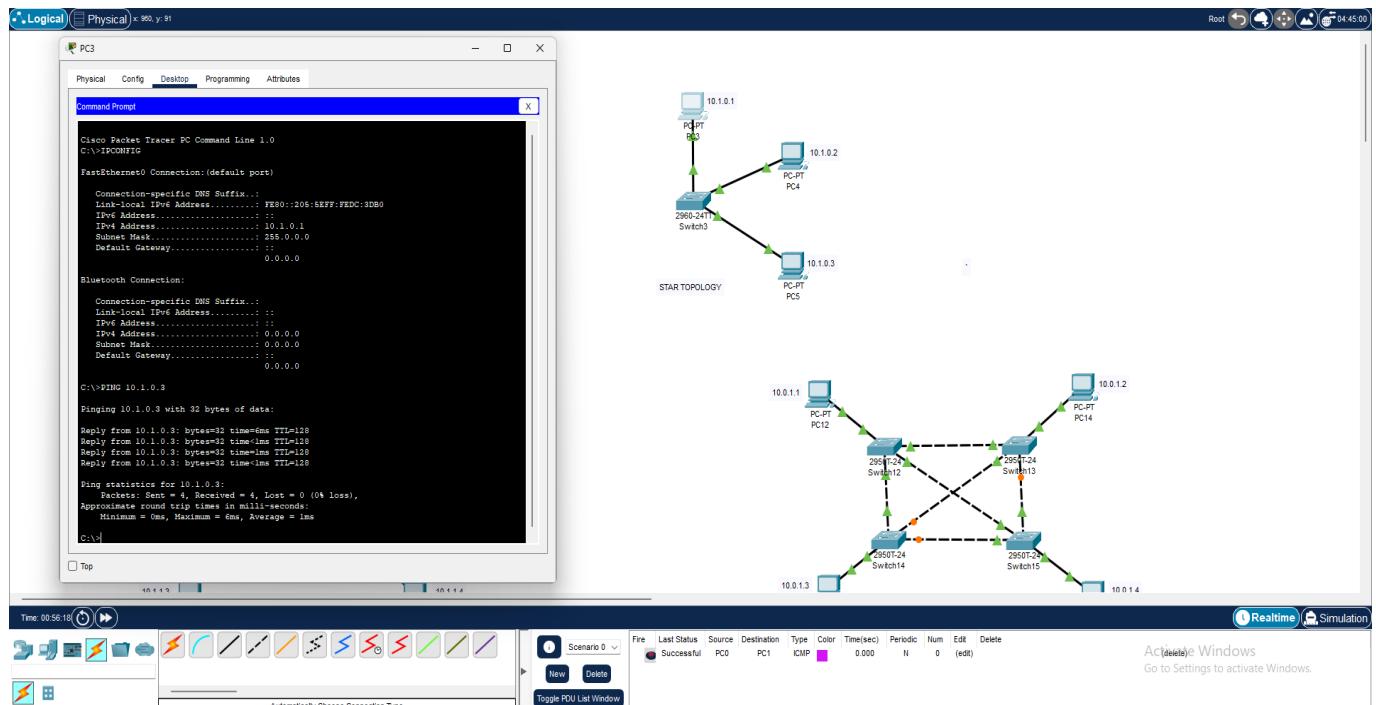
- Drag three computers onto the workspace.
- Connect each computer to every other computer using crossover cables.

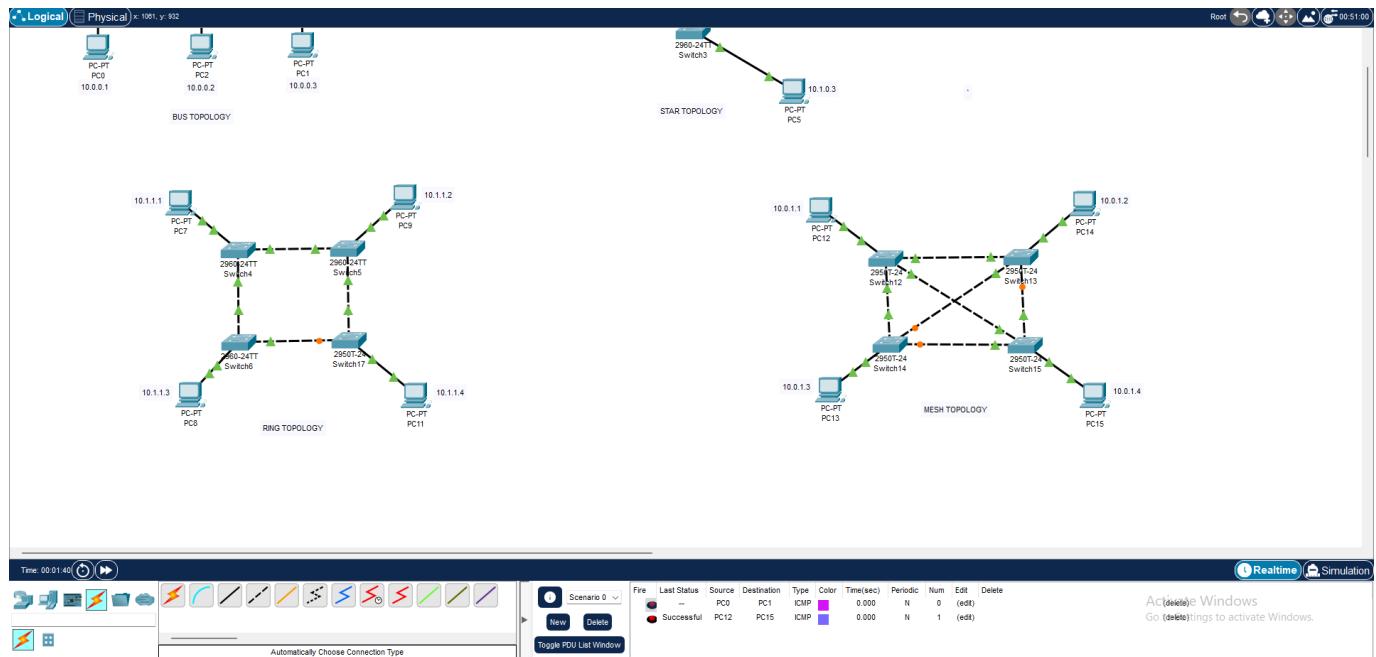
6. **Test Connectivity:**

- For each topology, assign IP addresses to the computers.
- Use the `ping` command to test connectivity between all computers.

Output:







Lab 3: Router Configuration (Creating Passwords, Configuring Interfaces)

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Simple Network:**

- Drag a router and two computers onto the workspace.
- Connect each computer to the router using straight-through Ethernet cables.

3. **Access Router CLI:**

- Click on the router, go to the CLI tab.

4. **Set Up Passwords:**

- Enter global configuration mode: `enable`, `configure terminal`.
- Set the console password: `line console 0`, `password cisco`, `login`.
- Set the enable password: `enable password cisco`.
- Set the VTY password: `line vty 0 4`, `password cisco`, `login`.

5. **Configure Router Interfaces:**

- Go to interface configuration mode for the first interface: `interface gig0/0`.
- Assign an IP address: `ip address 192.168.1.1 255.255.255.0`.
- Enable the interface: `no shutdown`.
- Repeat for the second interface: `interface gig0/1`, `ip address 192.168.2.1 255.255.255.0`, `no shutdown`.

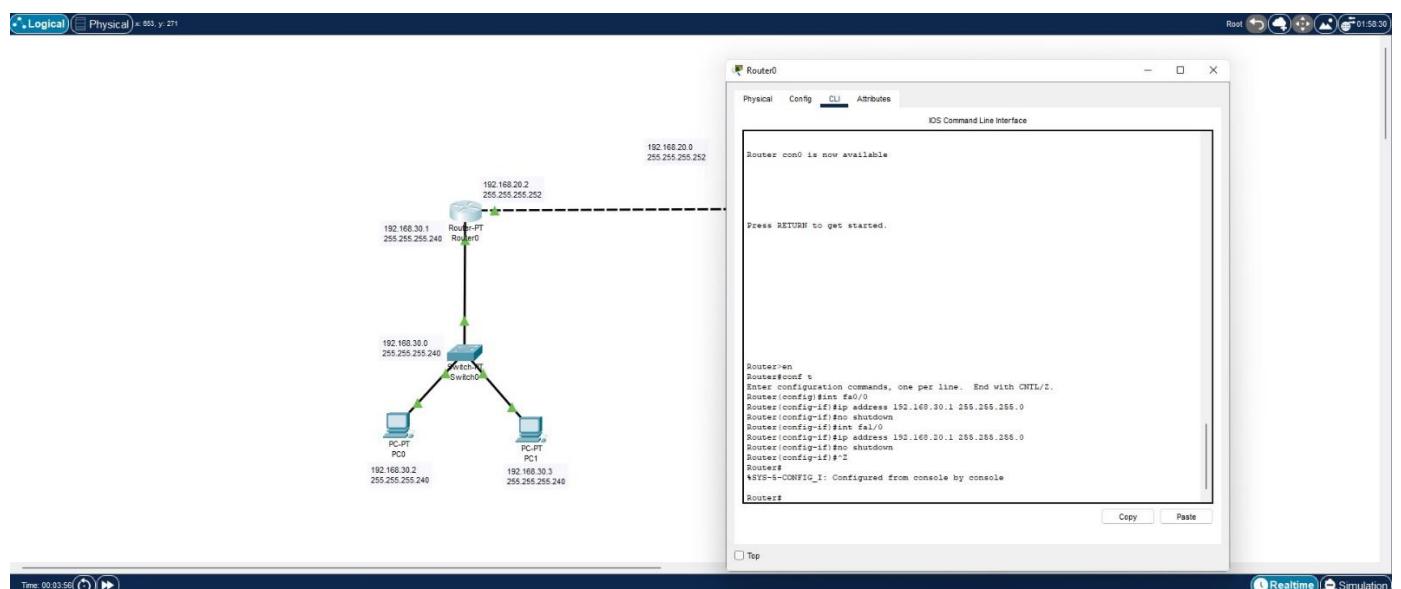
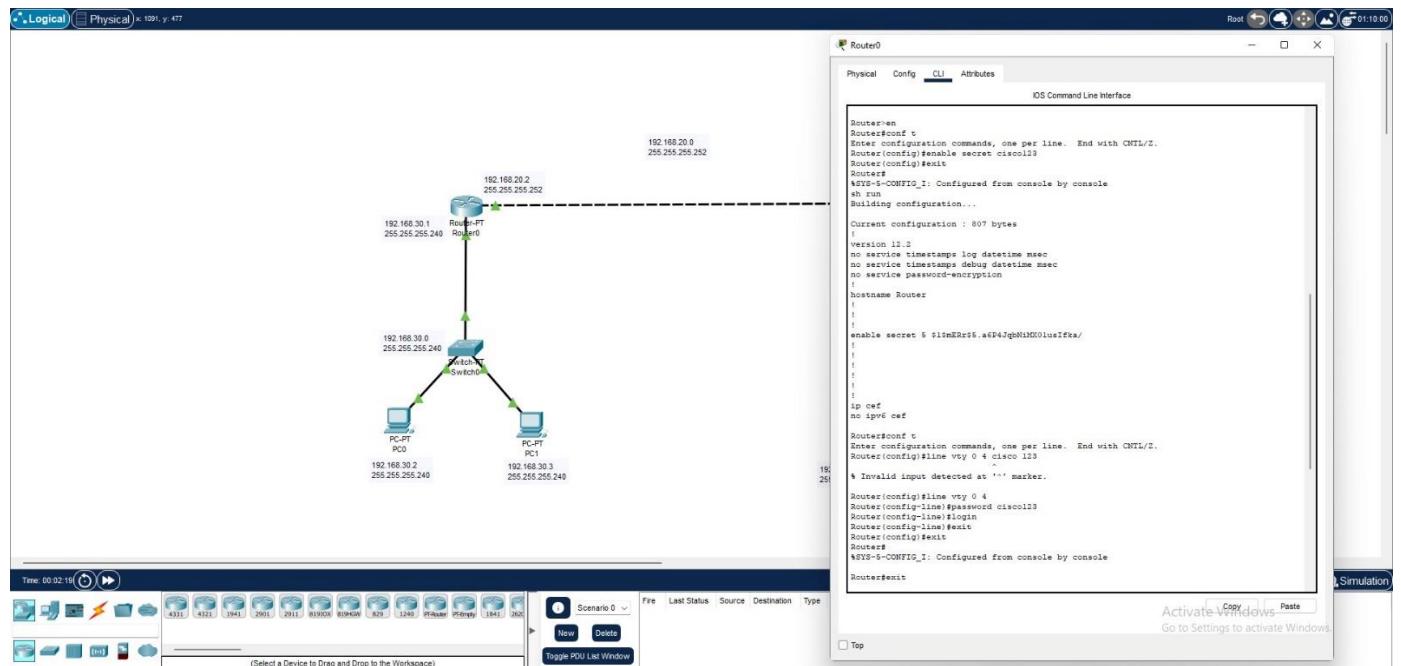
6. **Configure IP Addresses on Computers:**

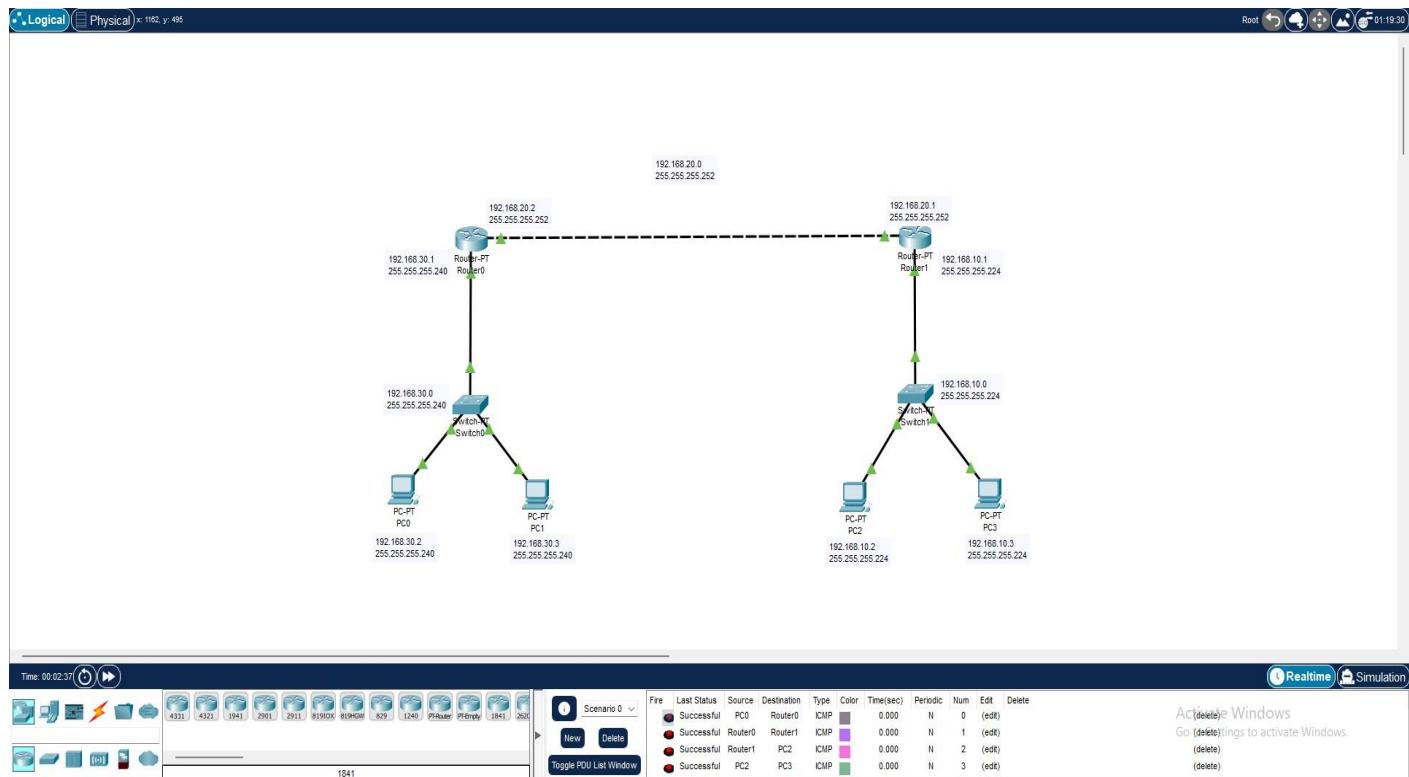
- Assign IP address 192.168.1.2 and 192.168.2.2 to the first and second computer, respectively.

7. **Test Connectivity:**

- Use the `ping` command to test connectivity between the computers through the router.

Output:



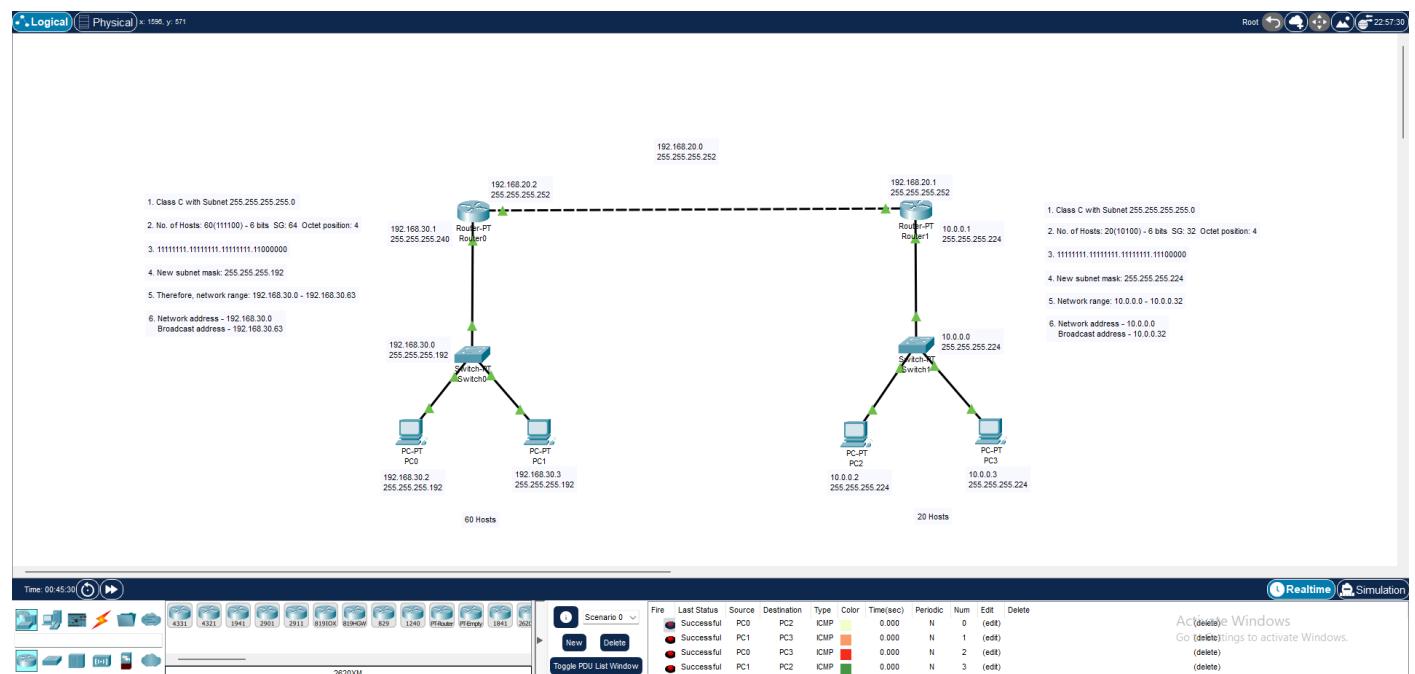


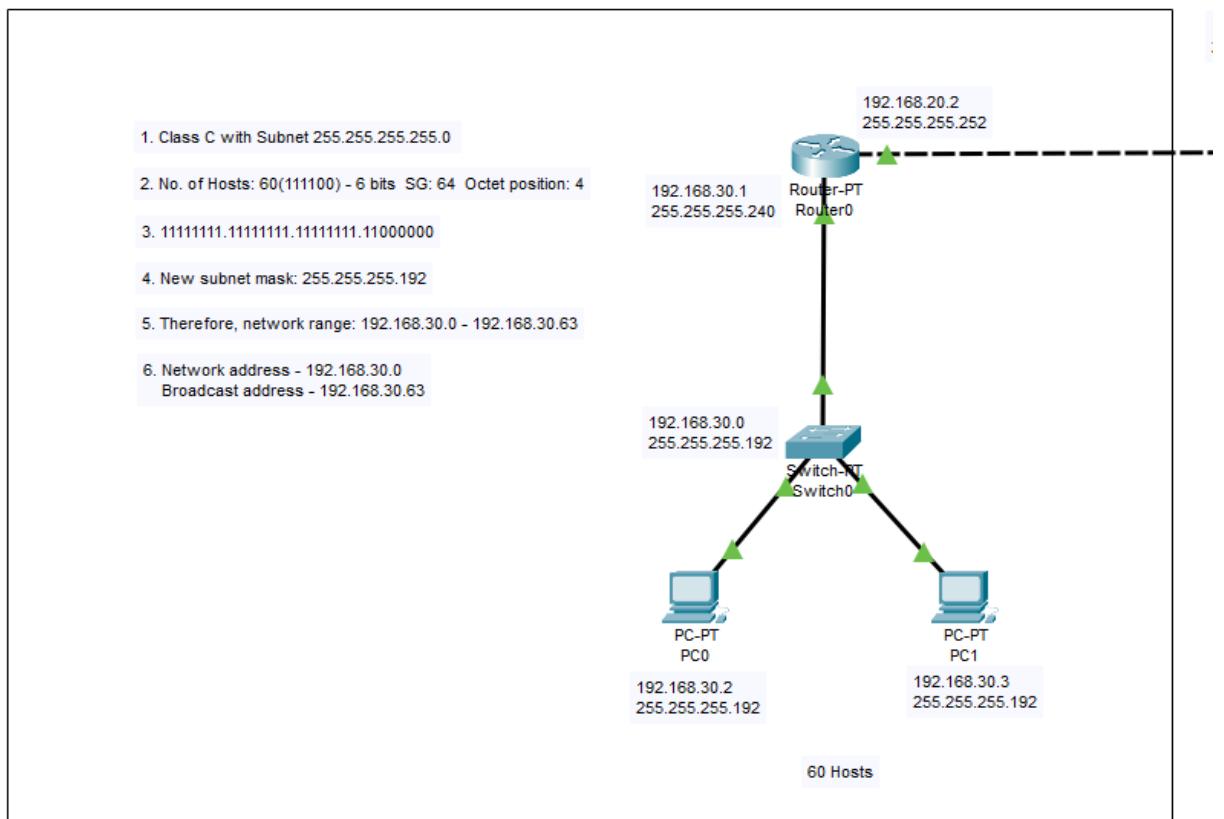
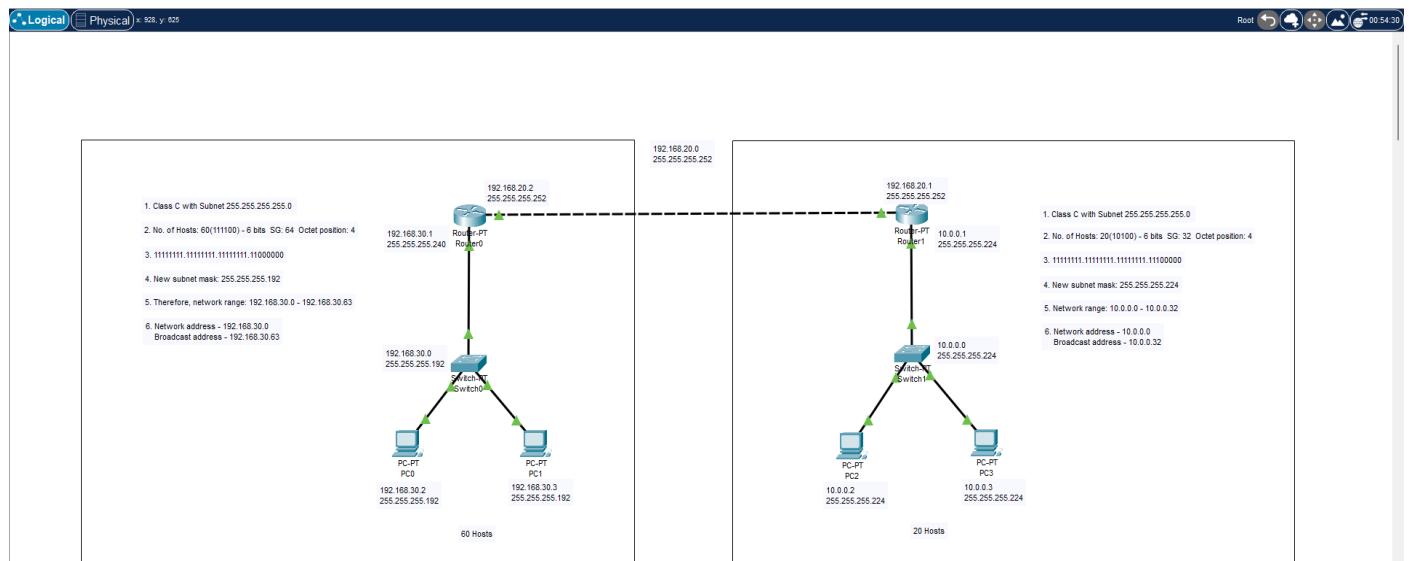
Lab 4: IP Addressing and Subnetting (VLSM)

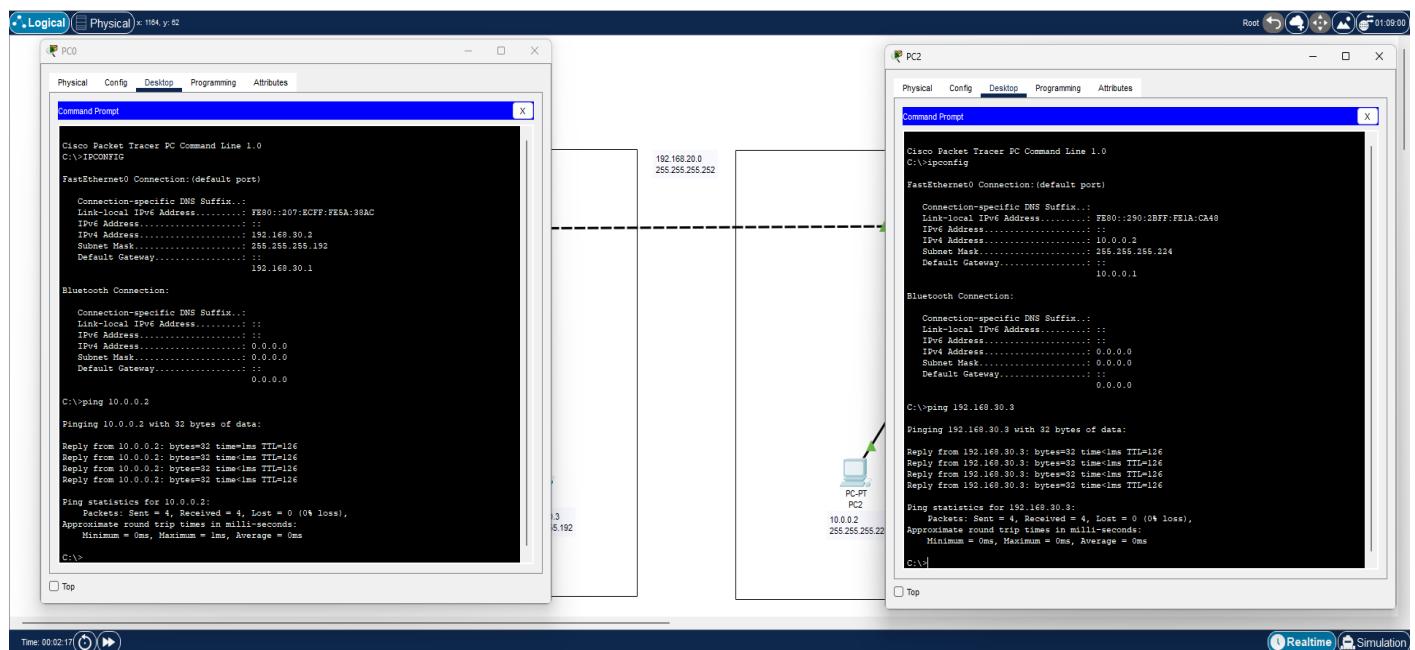
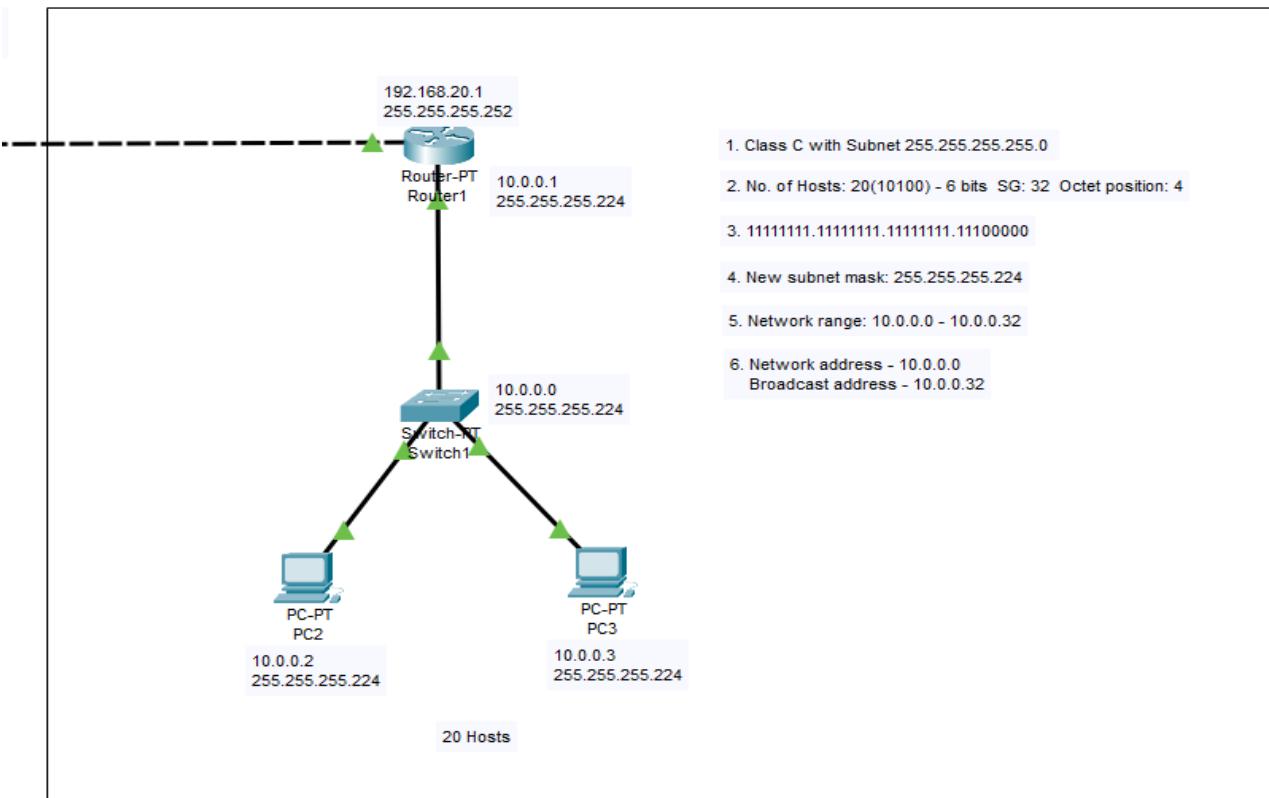
• Procedure:

1. Open Packet Tracer:
 - Launch Cisco Packet Tracer on your computer.
2. Design Network Topology:
 - Create a network with three routers connected in a triangular fashion.
3. Calculate Subnets Using VLSM:
 - Determine the number of required subnets and host addresses.
 - Divide the network into subnets using VLSM.
4. Assign IP Addresses:
 - Configure the interfaces of each router with the calculated IP addresses.
 - Example:
 - Router 1 to Router 2: 192.168.1.0/30
 - Router 1 to Router 3: 192.168.1.4/30
 - Router 2 to Router 3: 192.168.1.8/30
5. Configure Interfaces:
 - Access the CLI of each router.
 - Configure the IP addresses on each interface.
6. Test Connectivity:
 - Use the `ping` command to test connectivity between the routers.

Output:







Lab 5: Static and Default Routing

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag required routers and computers onto the workspace.
- Connect the routers using a serial connection.
- Connect each computer to a router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

4. **Configure Static Routes:**

- Example: On Router 1: `ip route 192.168.2.0 255.255.255.0 <Router 2Serial IP>`
- Example: On Router 2: `ip route 192.168.1.0 255.255.255.0 <Router 1Serial IP>`

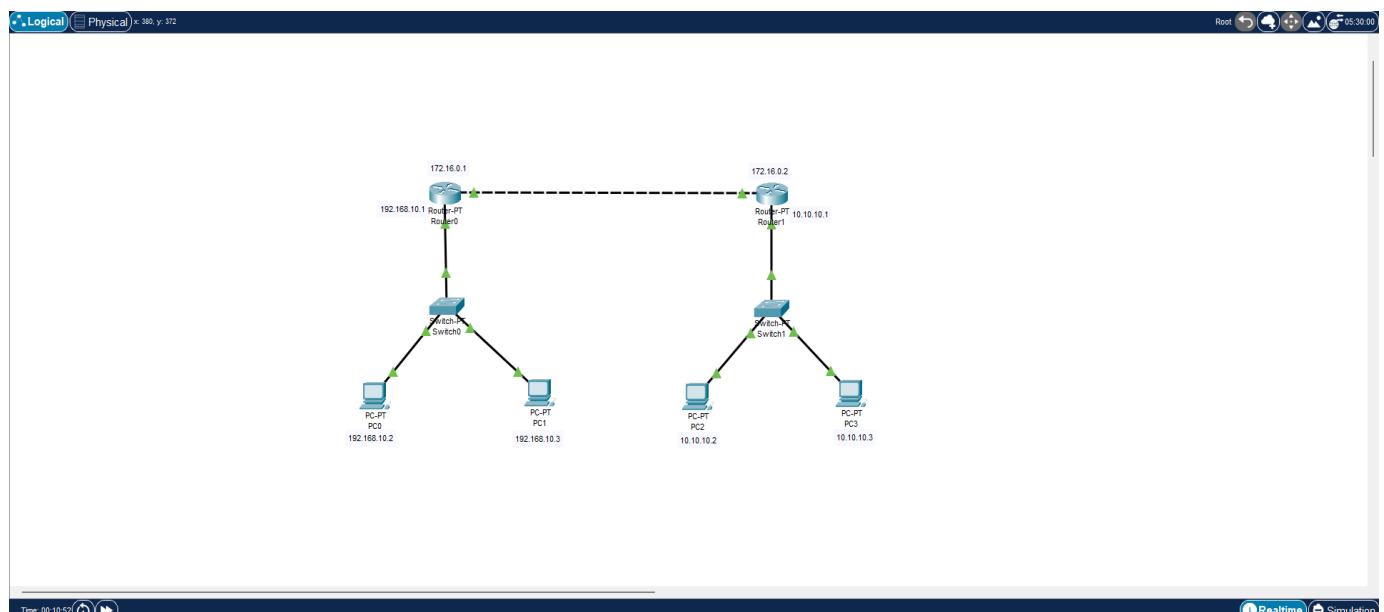
5. **Configure Default Route:**

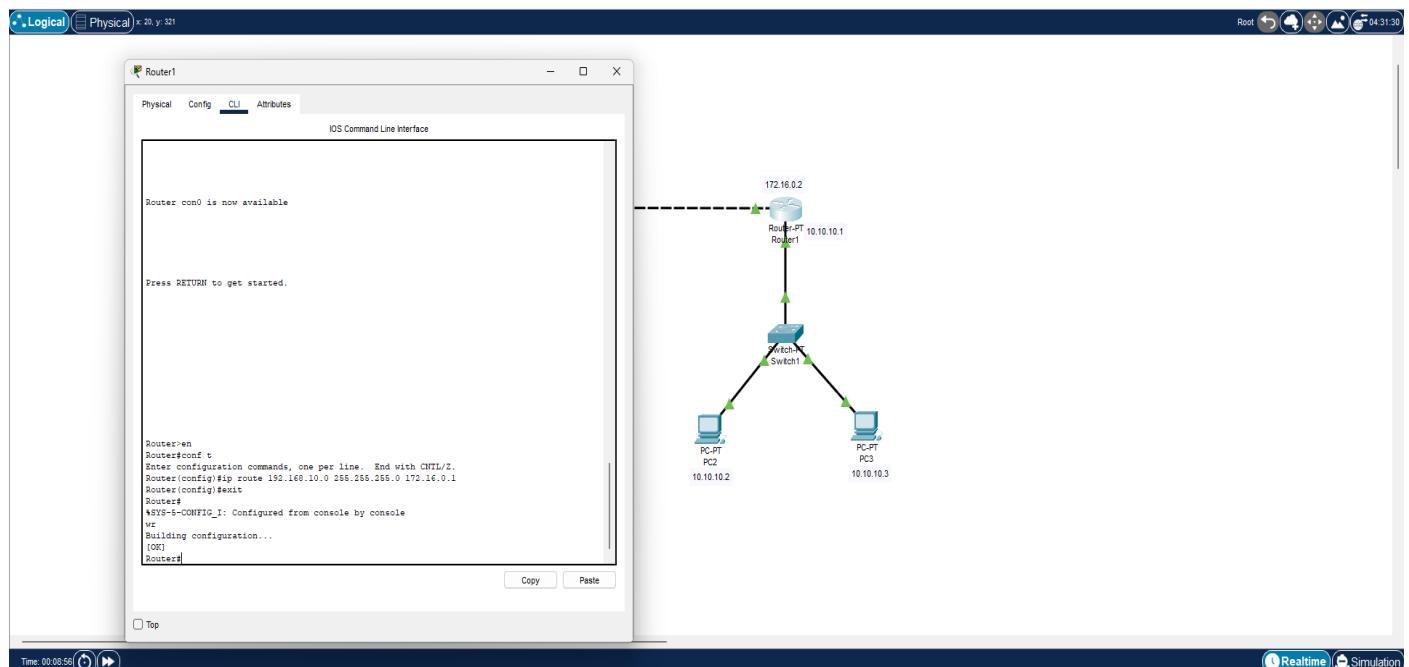
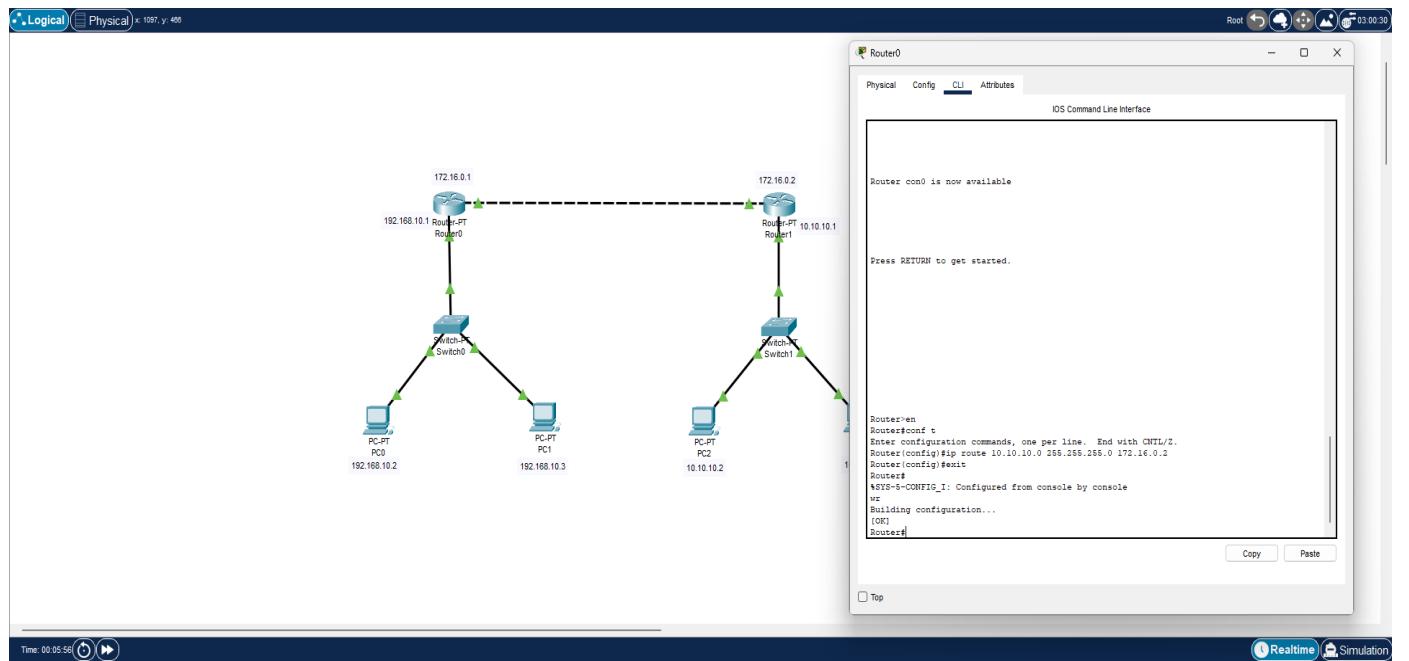
- Example: On Router 1: `ip route 0.0.0.0 0.0.0.0 <Router 2 SerialIP>`
- Example: On Router 2: `ip route 0.0.0.0 0.0.0.0 <Router 1 SerialIP>`

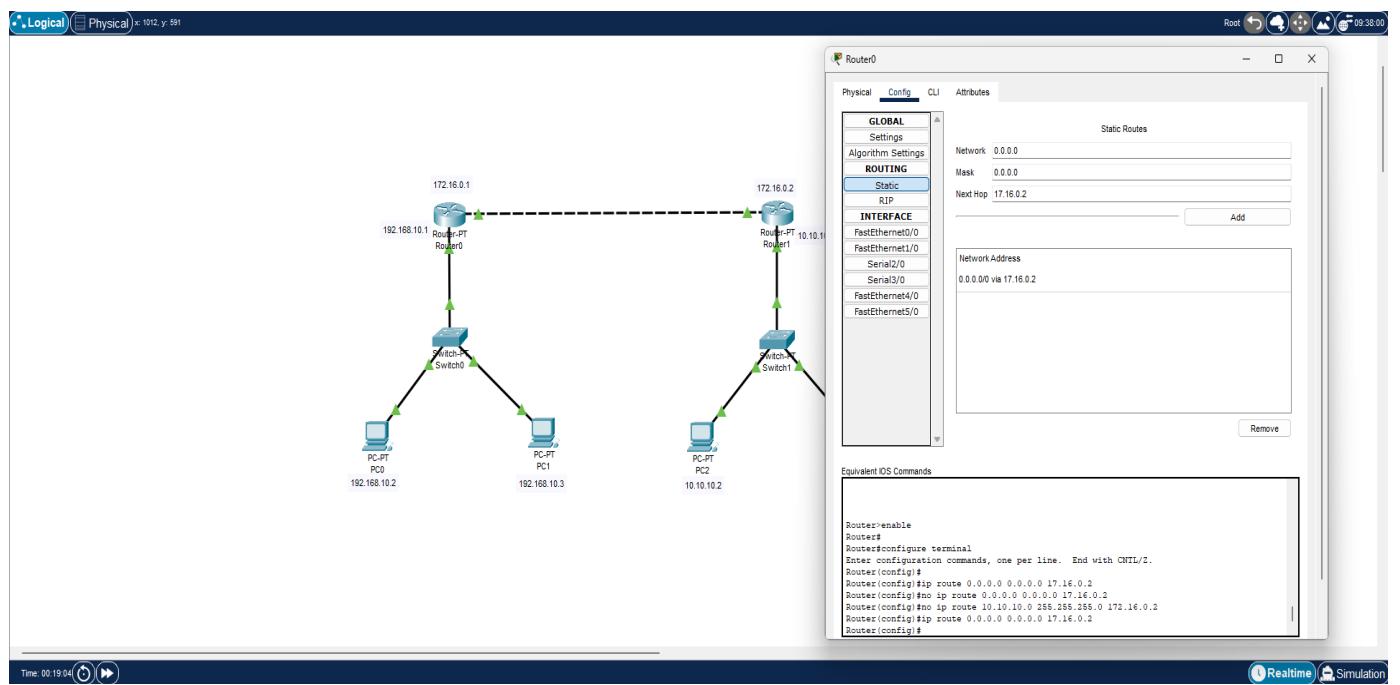
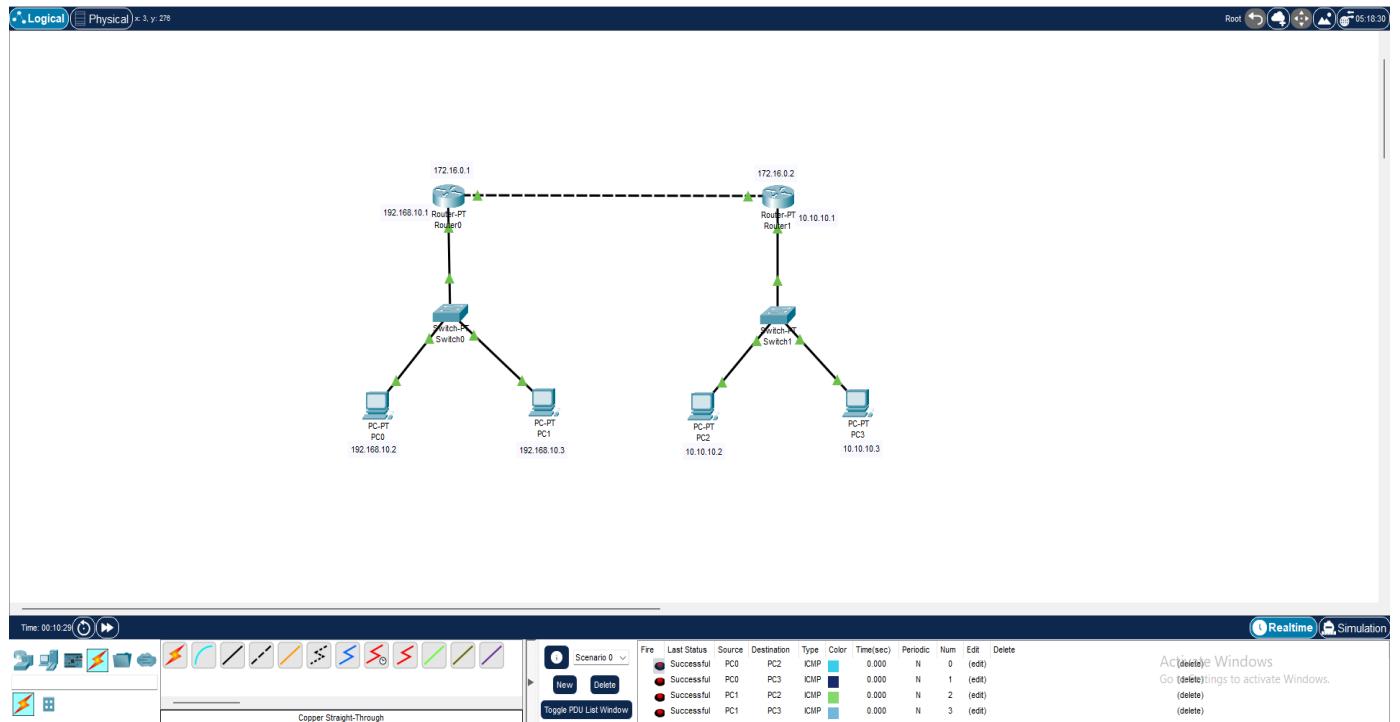
6. **Test Connectivity:**

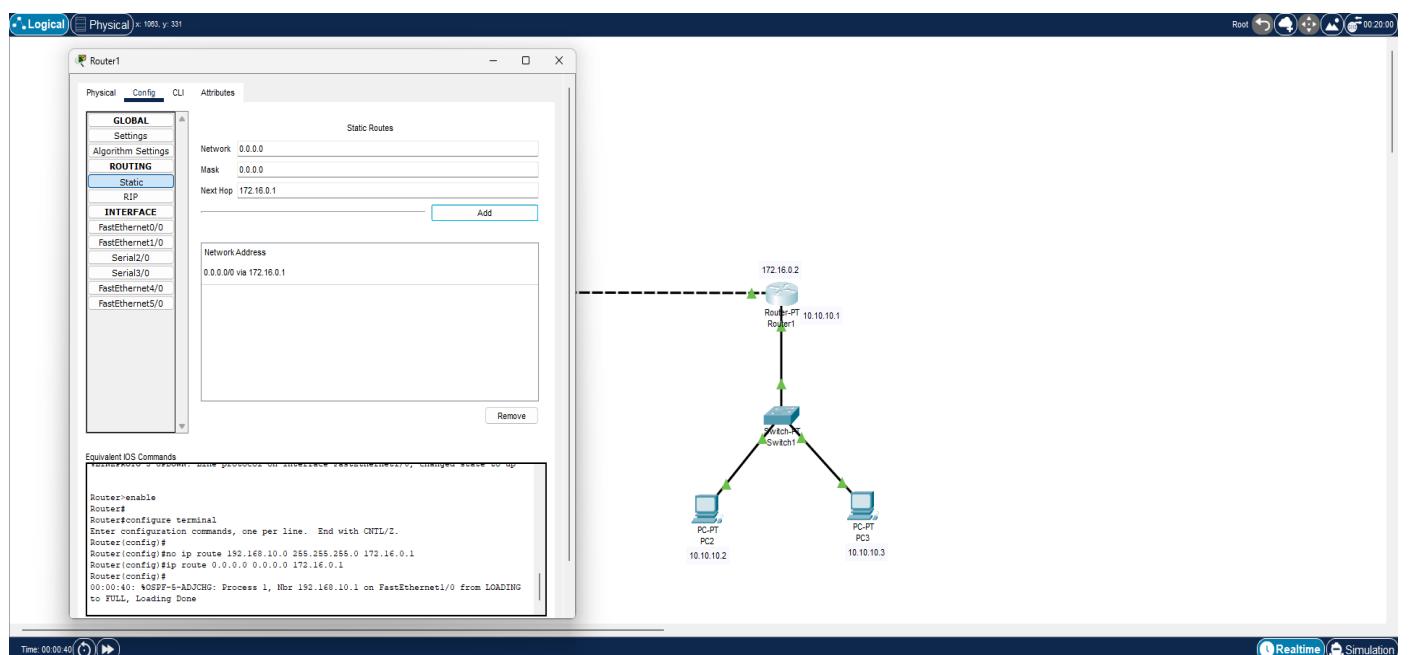
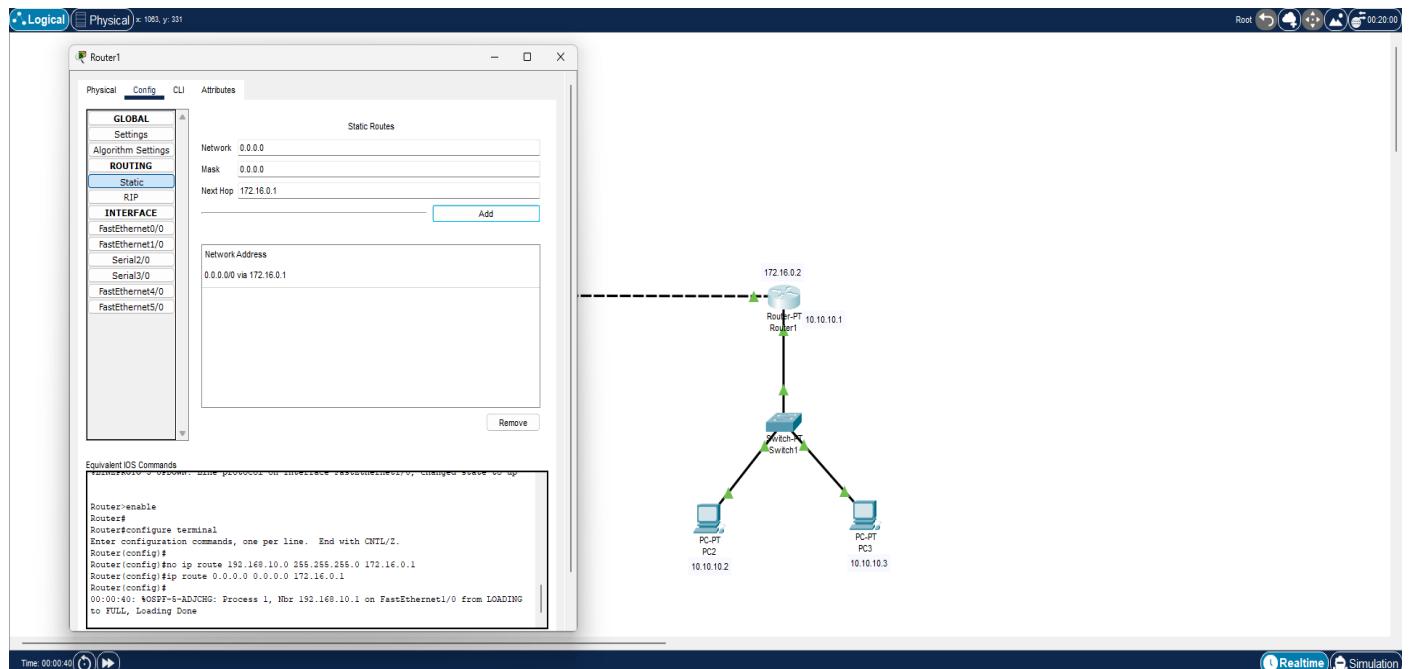
- Use the `ping` command to test connectivity between the computers.

Output:









Lab 6: NAT Configuration

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag a router, a switch, and two computers onto the workspace.
- Connect the computers to the switch and the switch to the router.

3. **Configure IP Addresses:**

- Assign private IP addresses to the computers.
- Assign a public IP address to the router's external interface.

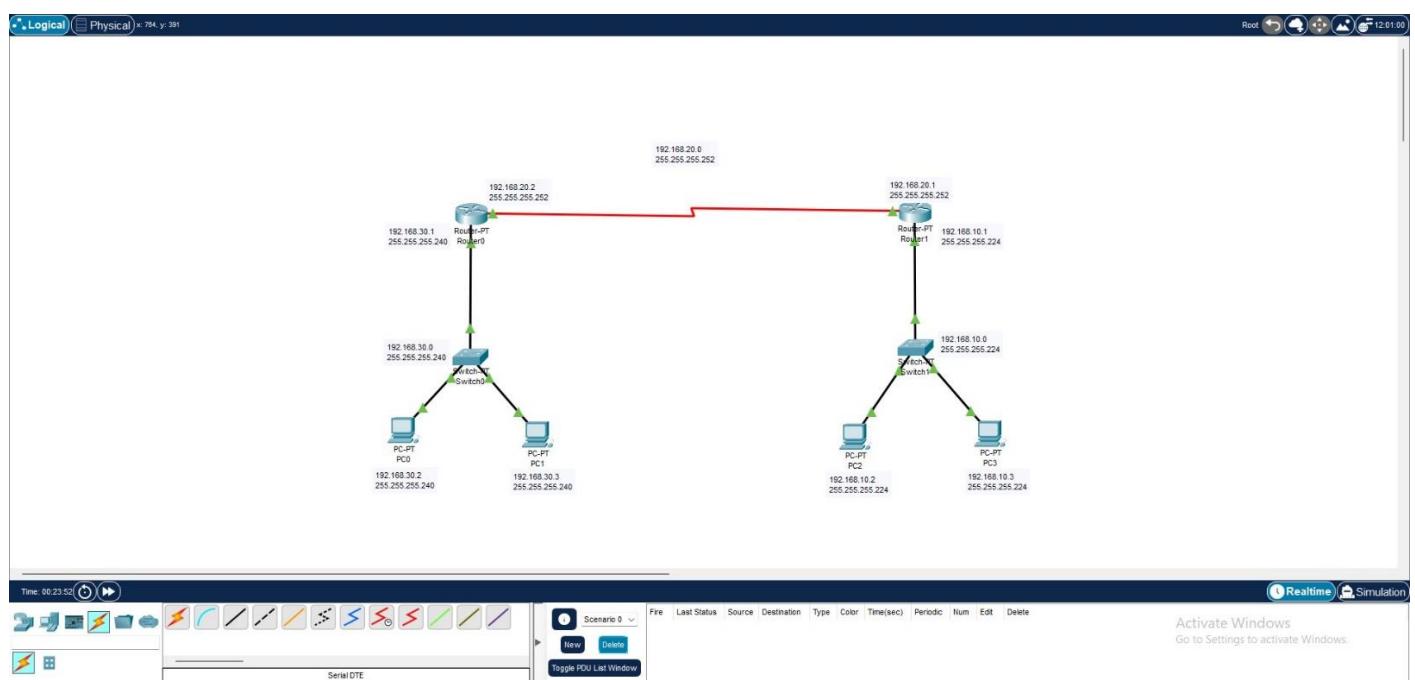
4. **Configure NAT:**

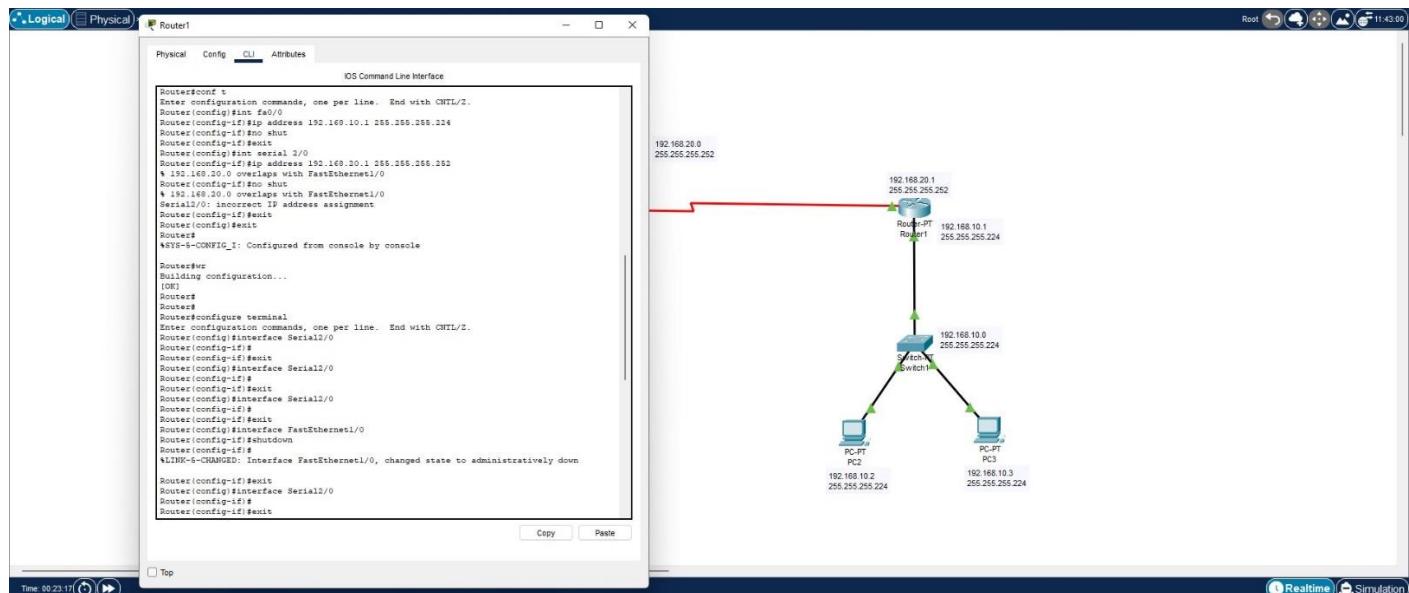
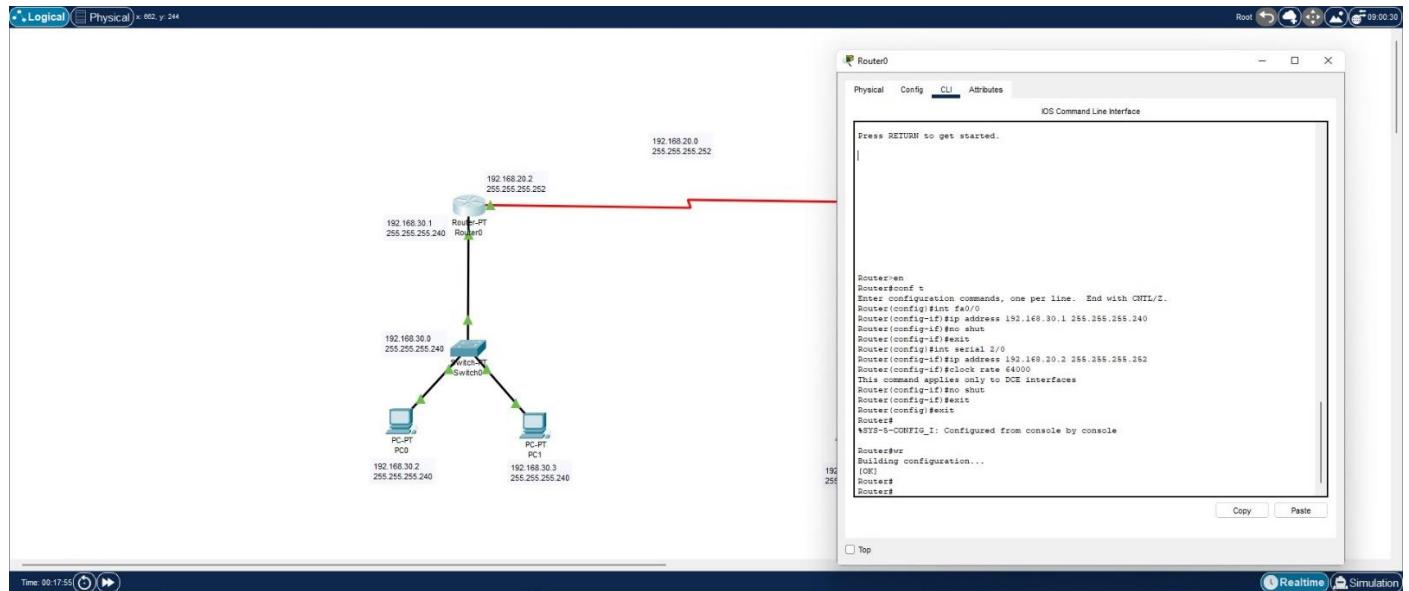
- Access the router's CLI.
- Define an access list to match the private IP addresses: `access-list 1 permit 192.168.1.0 0.0.0.255`.
- Configure NAT overload: `ip nat inside source list 1 interface <external interface> overload`.
- Designate interfaces as inside or outside: `interface <internal interface>, ip nat inside; interface <external interface>, ip nat outside`.

5. **Test Connectivity:**

- Use the `ping` command to test connectivity from the internal network to an external network.

Output:





Lab 7: Implementation of RIP Version 1

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag three routers onto the workspace and connect them in a linear topology.
- Connect a computer to each router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

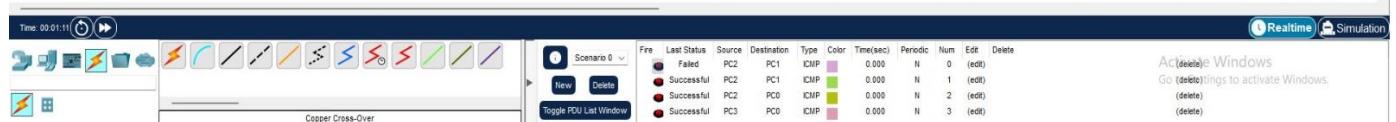
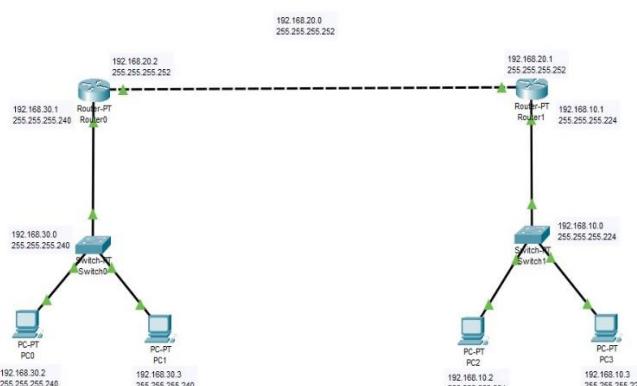
4. **Enable RIP Version 1:**

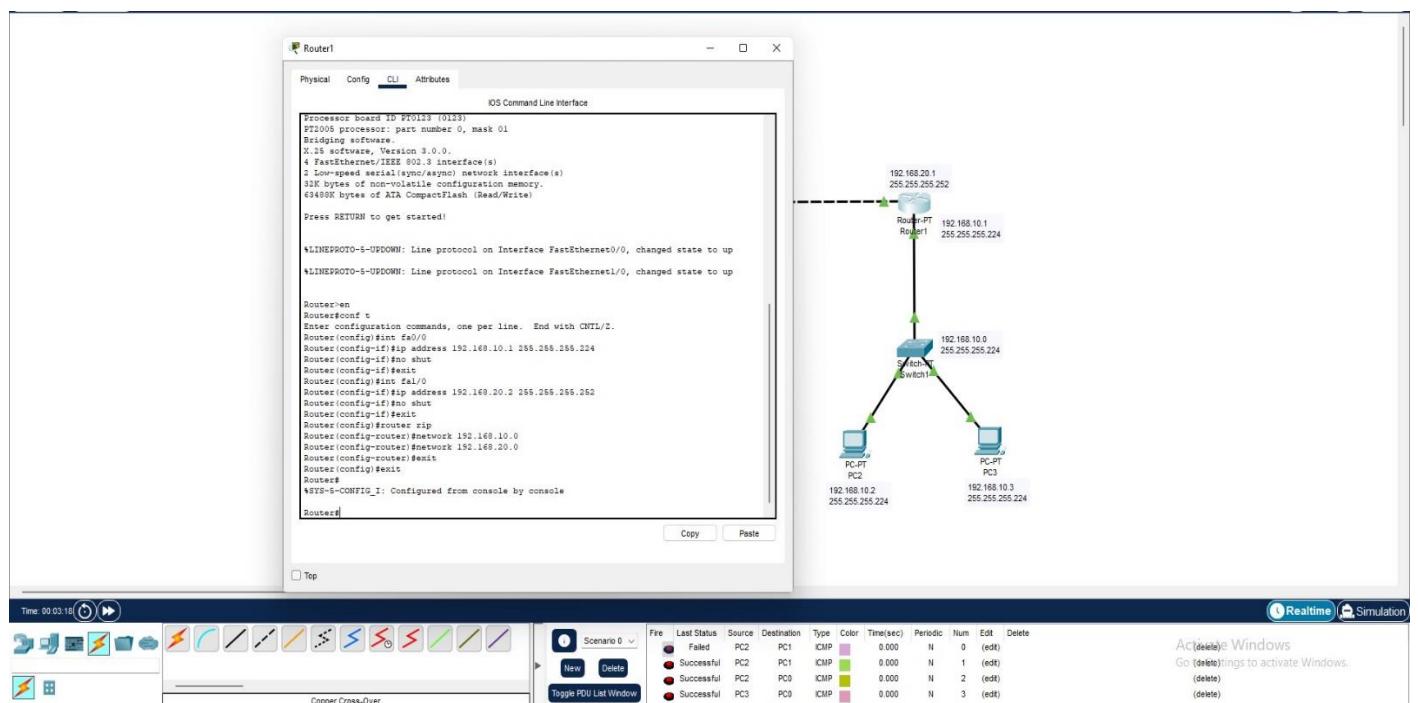
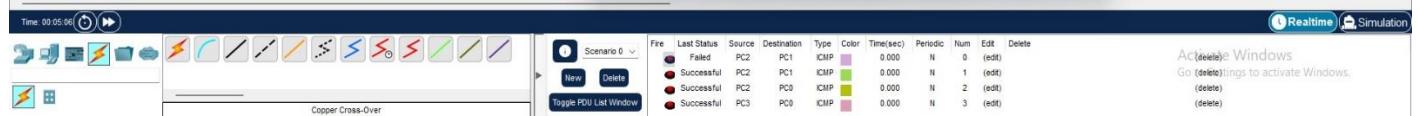
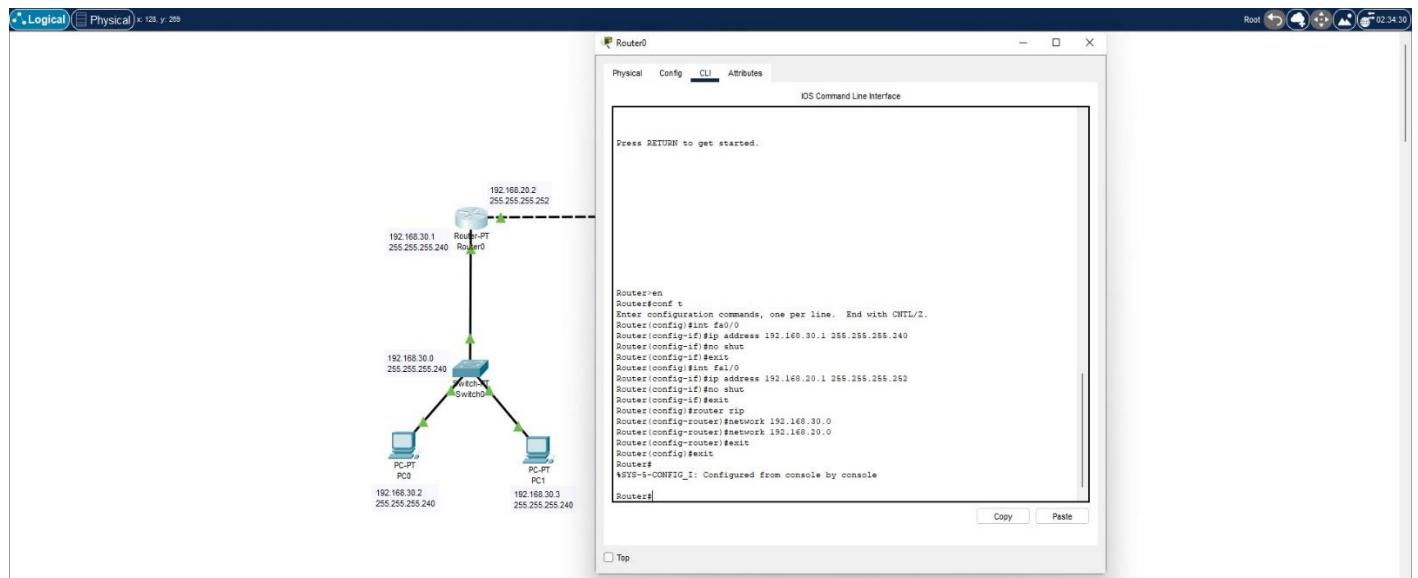
- Access the CLI of each router.
- Enable RIP routing: `router rip, version 1.`
- Advertise connected networks: `network <network address>`.

5. **Test Connectivity:**

- Use the `ping` command to test connectivity between the computers.

Output:





Lab 8: Implementation of RIP Version 2

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag three routers onto the workspace and connect them in a linear topology.
- Connect a computer to each router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

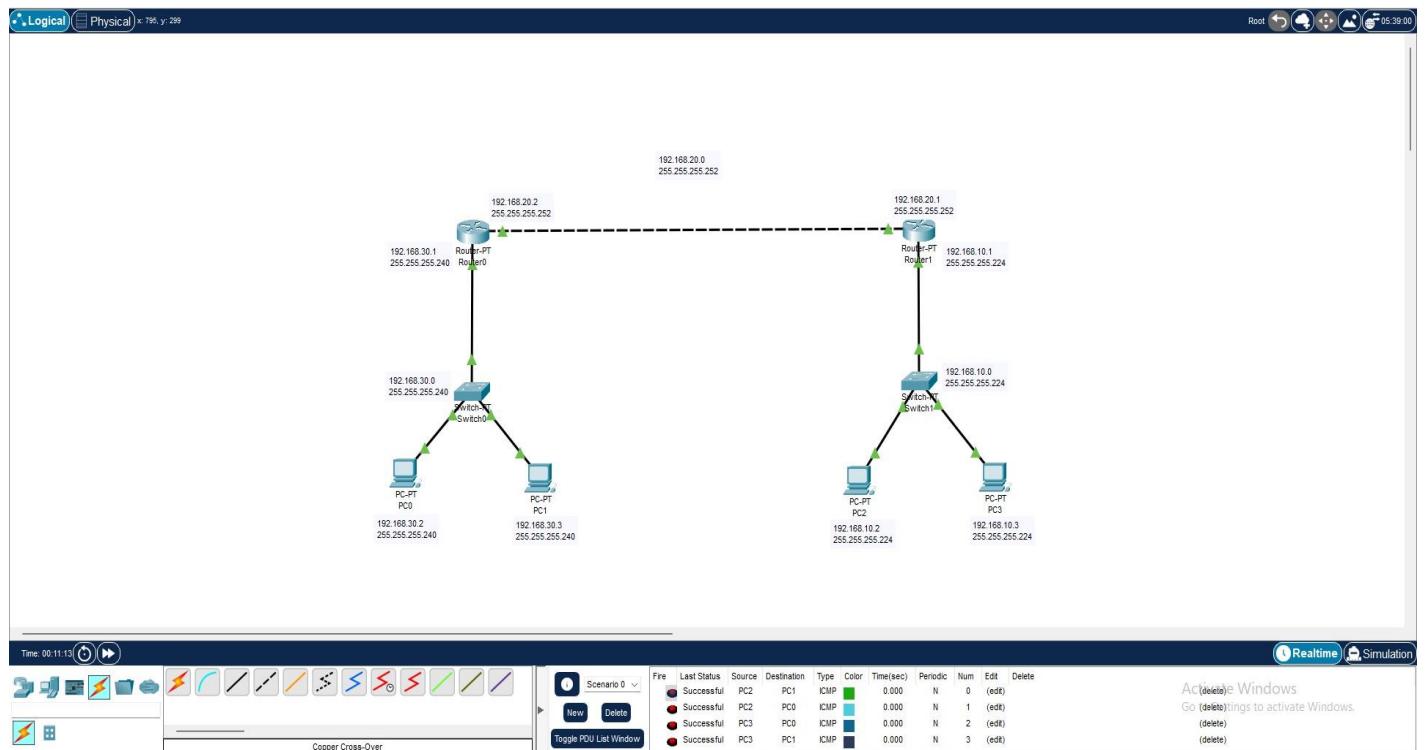
4. **Enable RIP Version 2:**

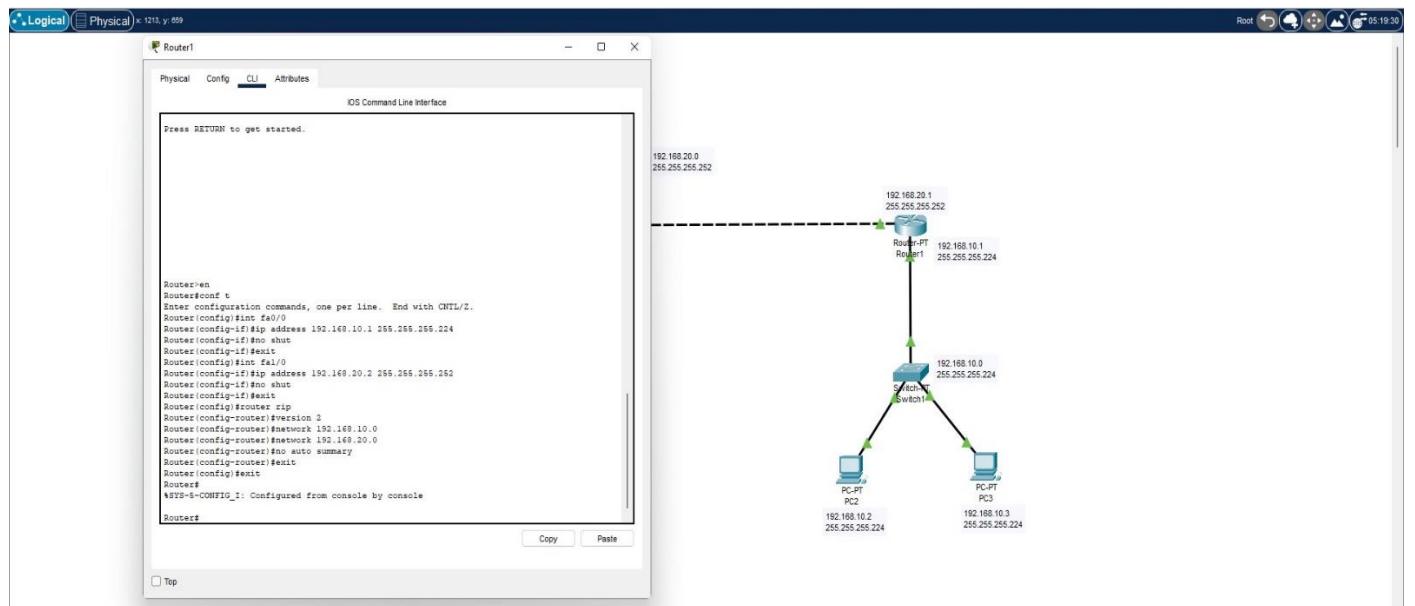
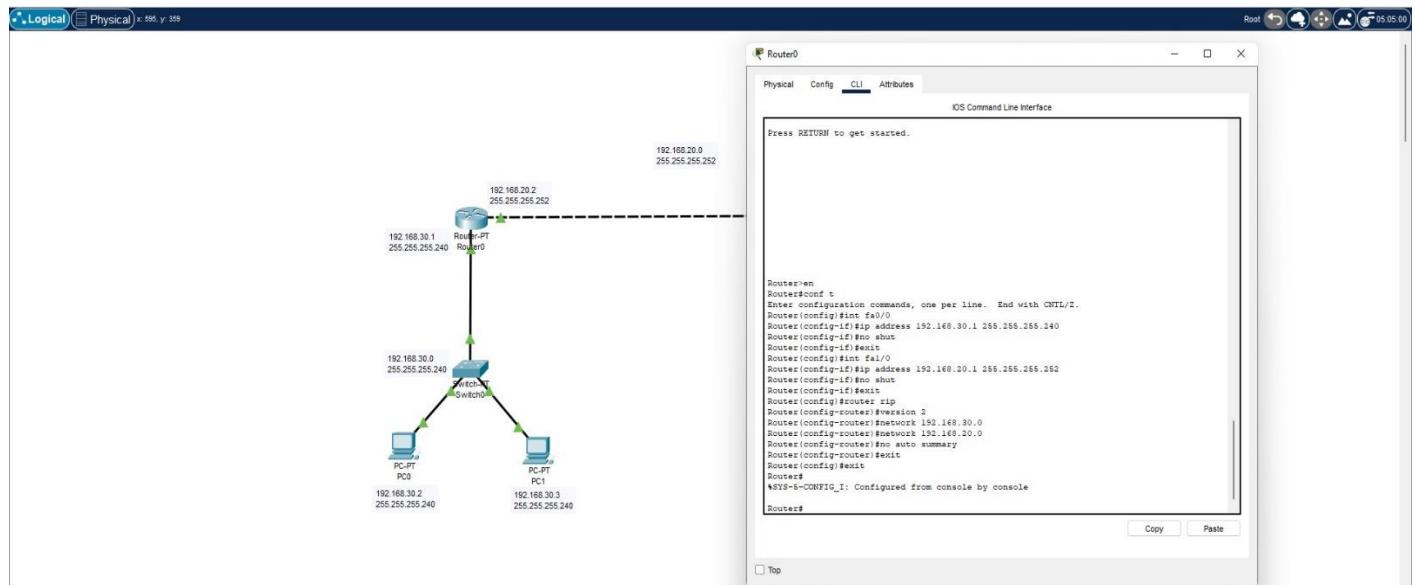
- Access the CLI of each router.
- Enable RIP routing: `router rip, version 2`.
- Advertise connected networks: `network <network address>`.

5. **Test Connectivity:**

- Use the `ping` command to test connectivity between the computers.

Output:





Lab 9: Implementation of Single Area OSPF

- **Procedure:**

1. Open Packet Tracer:

- Launch Cisco Packet Tracer on your computer.

2. Create a Network:

- Drag three routers onto the workspace and connect them in a triangular topology.

- Connect a computer to each router using Ethernet cables.

3. Configure IP Addresses:

- Assign IP addresses to each interface on the routers and computers.

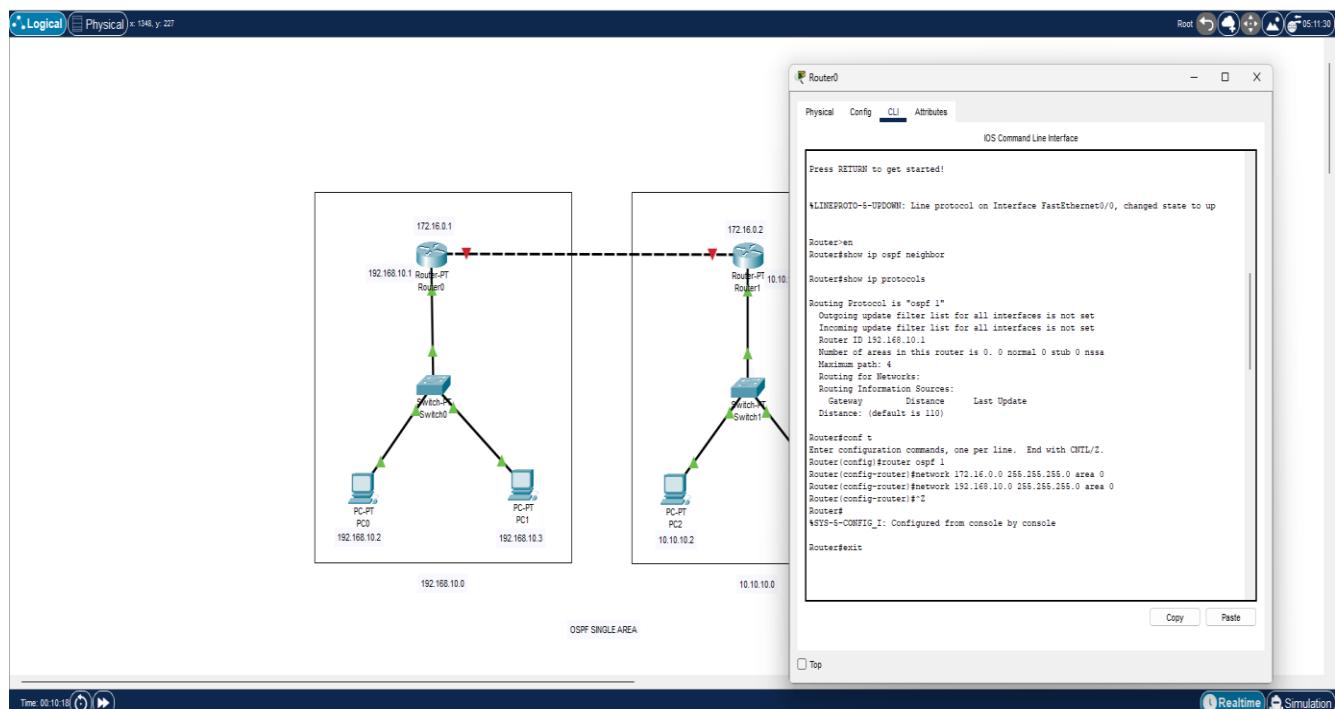
4. Enable OSPF:

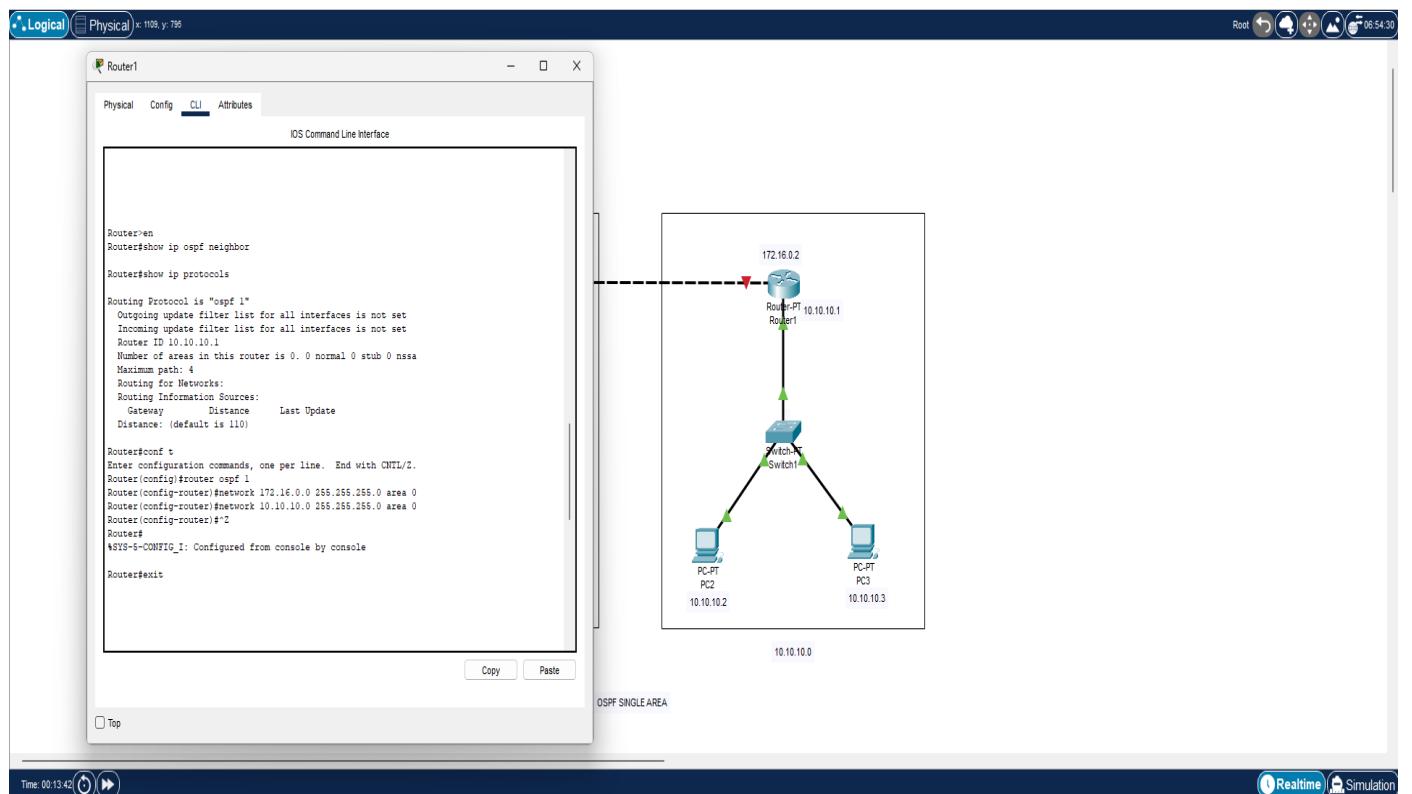
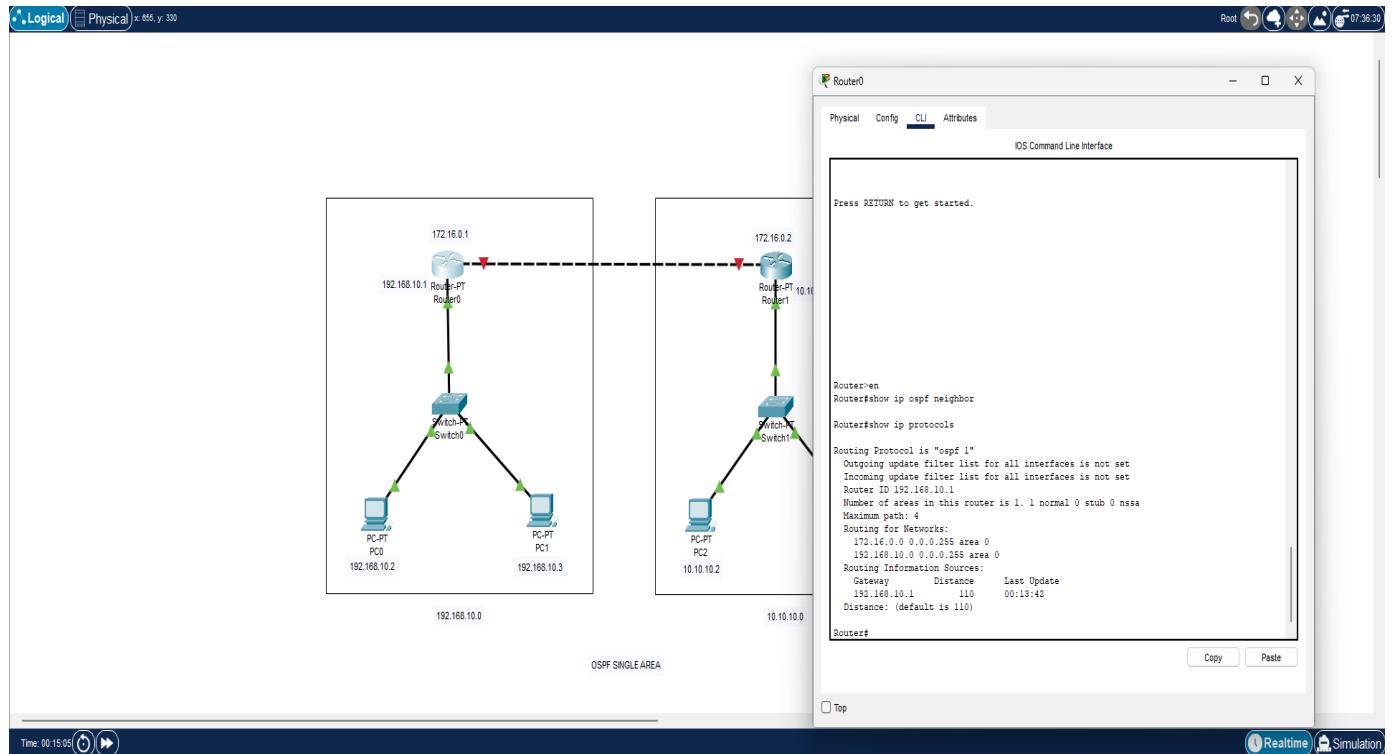
- Access the CLI of each router.
 - Enable OSPF: `router ospf 1`.
 - Advertise connected networks: `network <network address> area 0`.

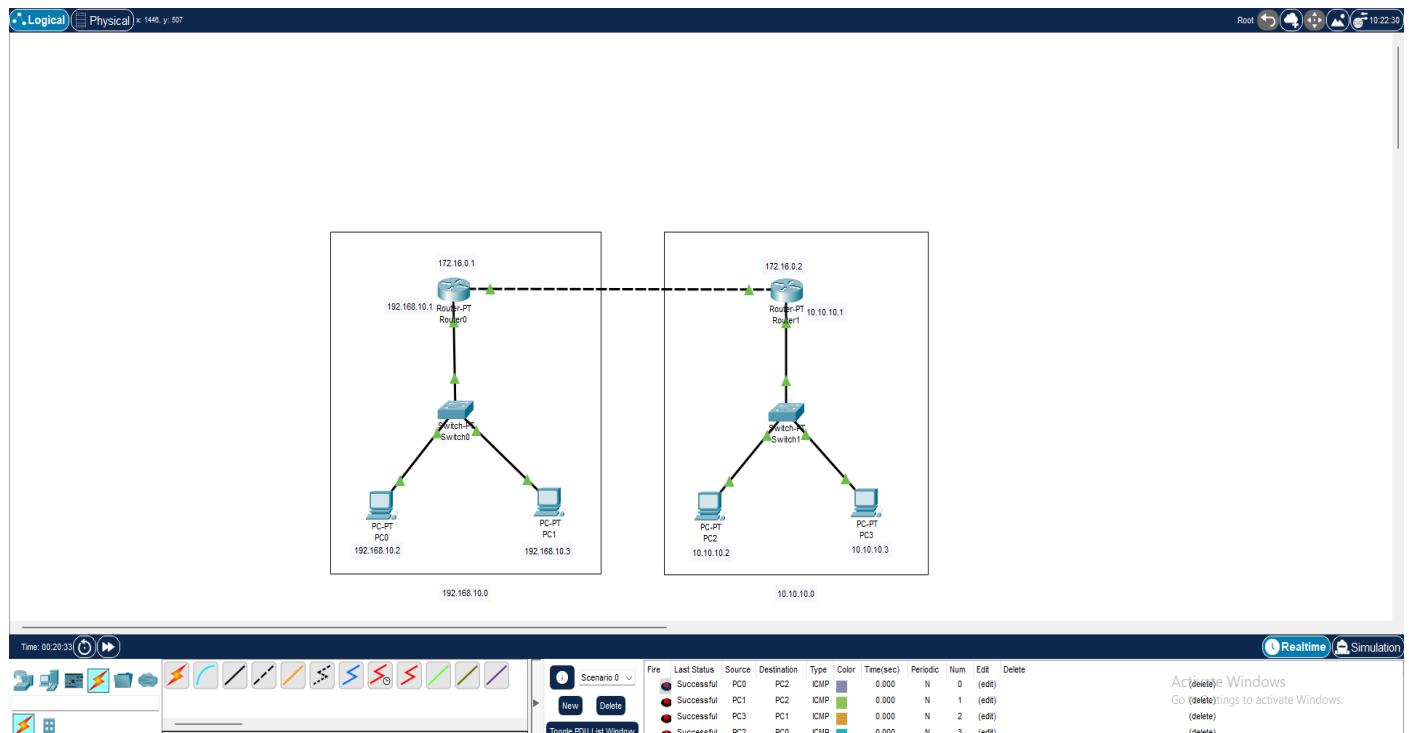
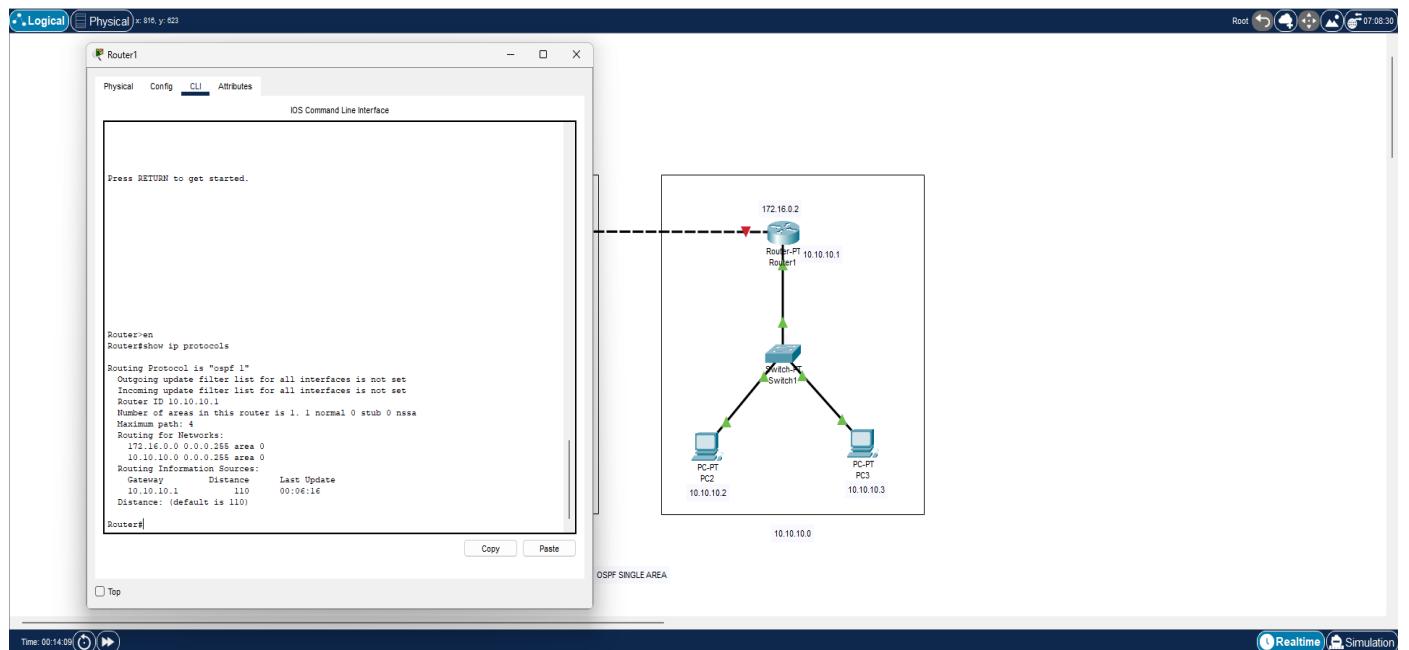
5. Test Connectivity:

- Use the `ping` command to test connectivity between the computers.

Output:







Lab 10: Implementation of Multi Area OSPF

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag four routers onto the workspace and connect them to form two separate OSPF areas with an Area 0 backbone.
- Connect a computer to each router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

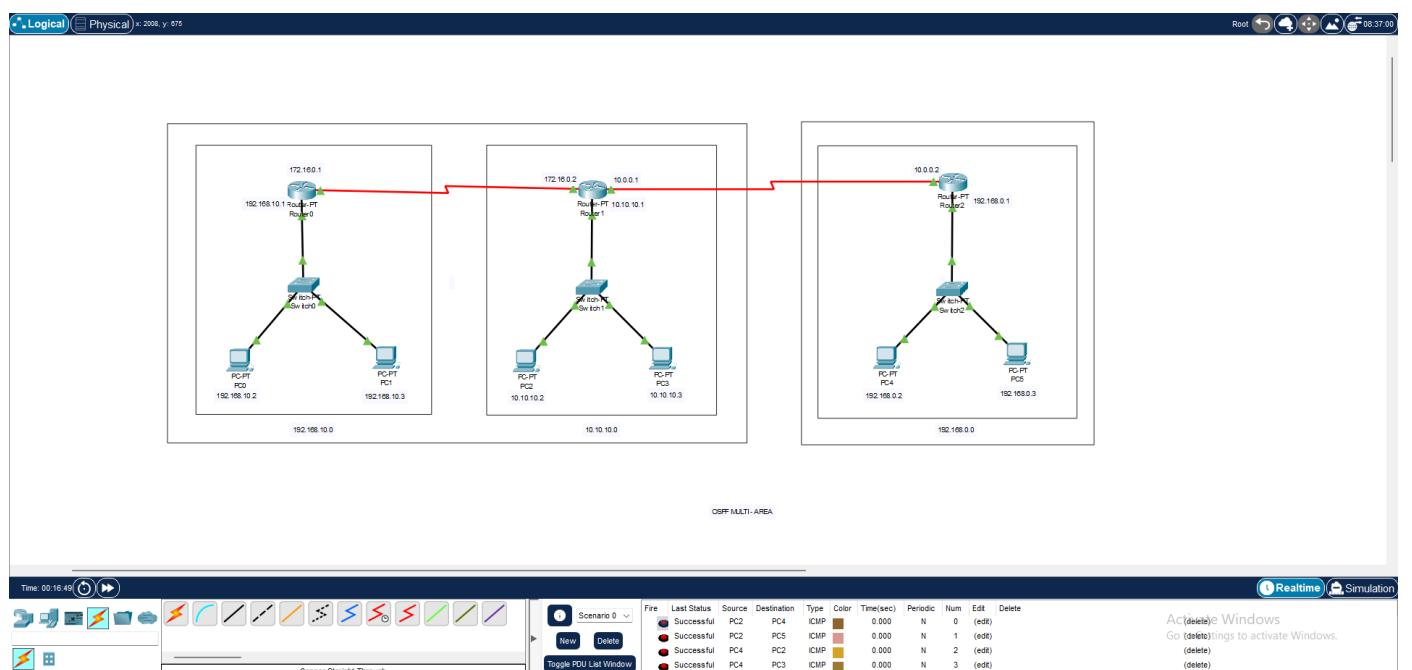
4. **Enable OSPF:**

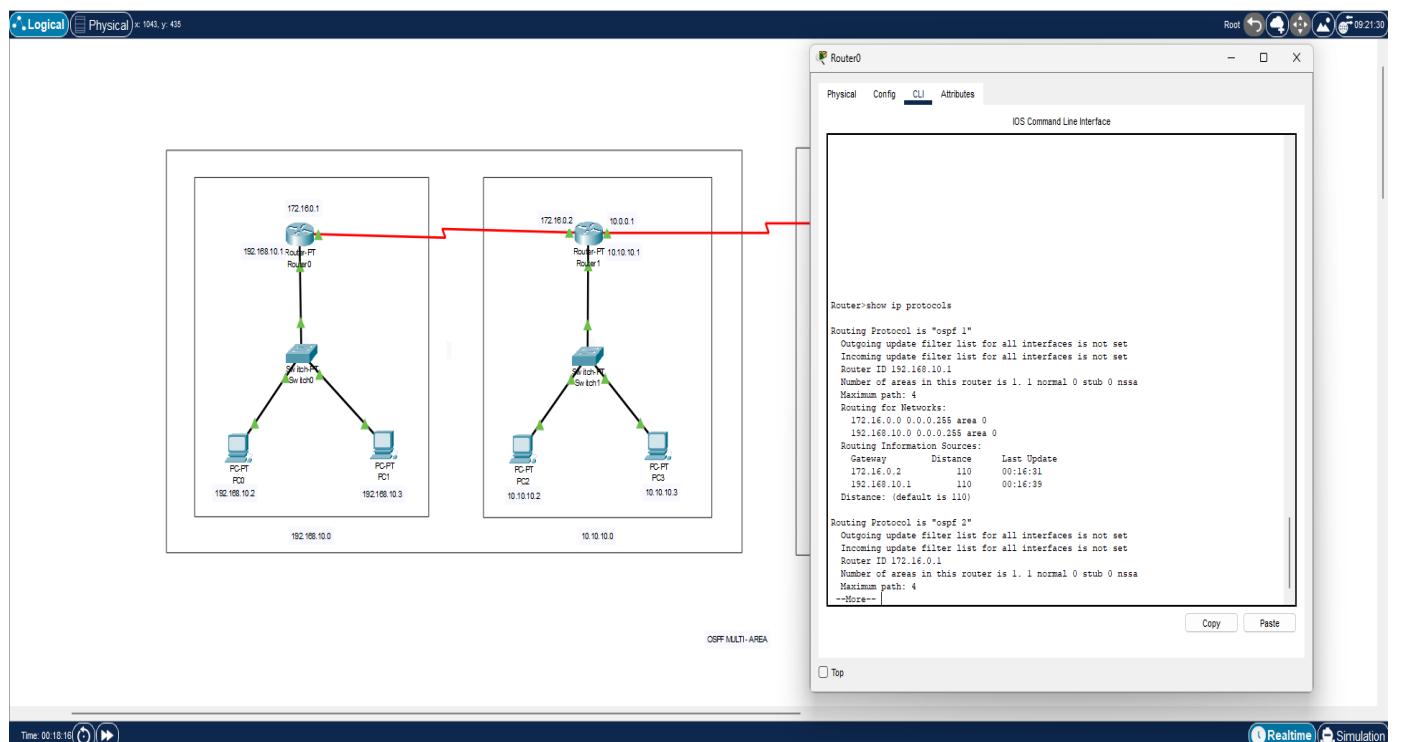
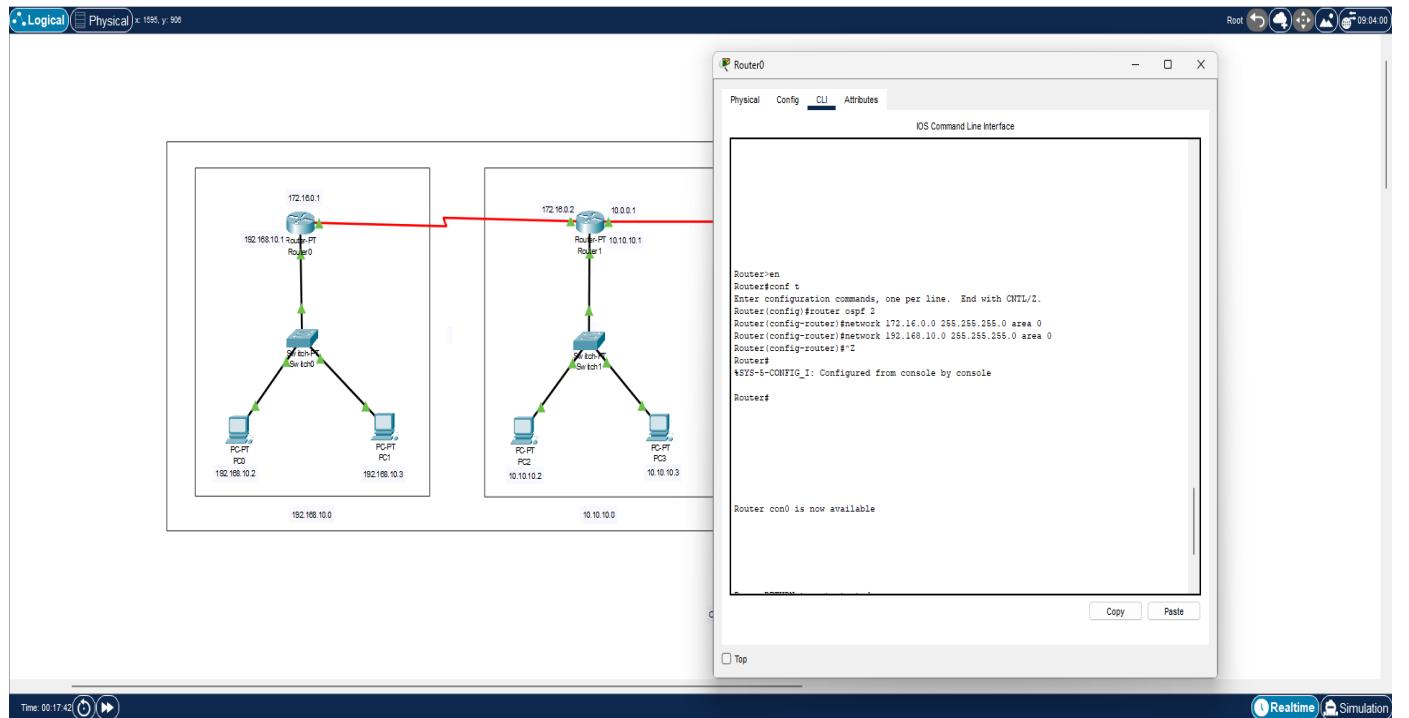
- Access the CLI of each router.
- Enable OSPF on Area 0 routers: `router ospf 1`.
- Advertise connected networks: `network <network address> area 0`.
- Enable OSPF on Area 1 routers: `router ospf 1`.
- Advertise connected networks: `network <network address> area 1`.

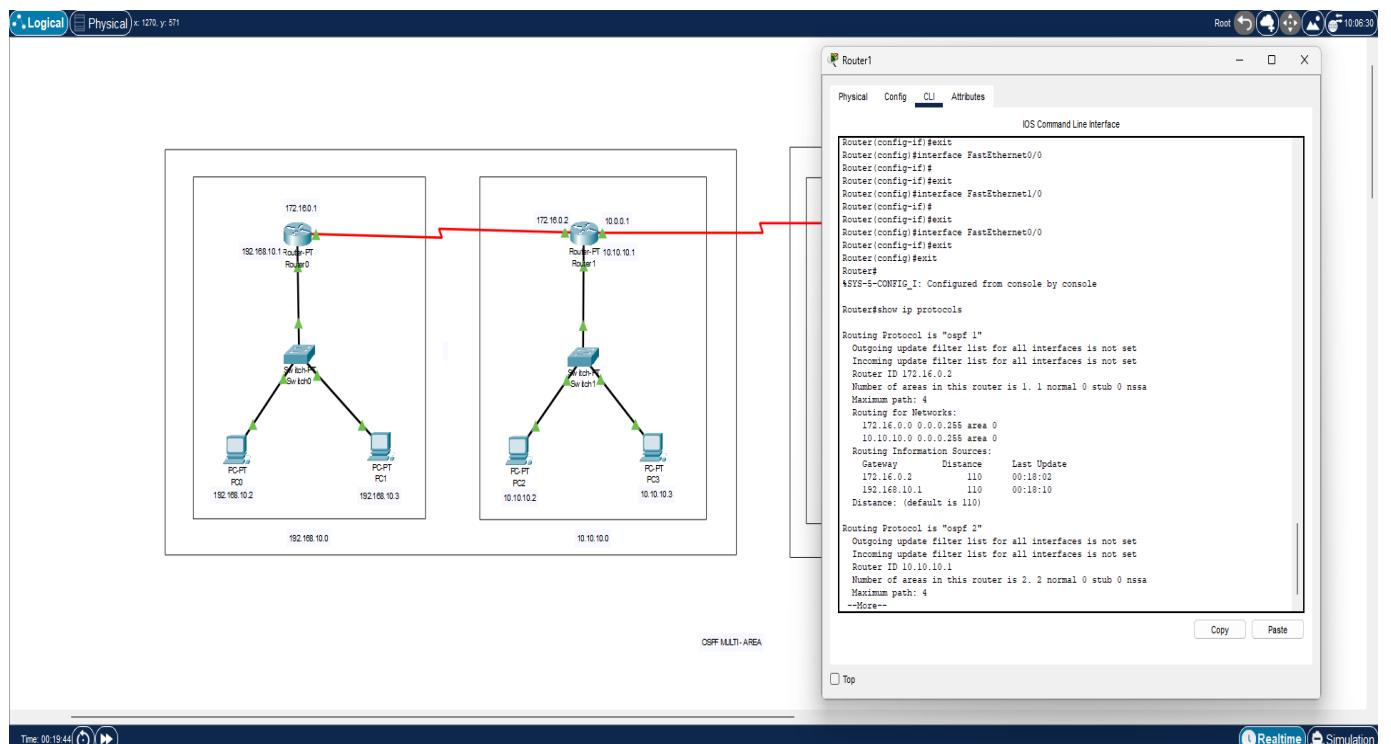
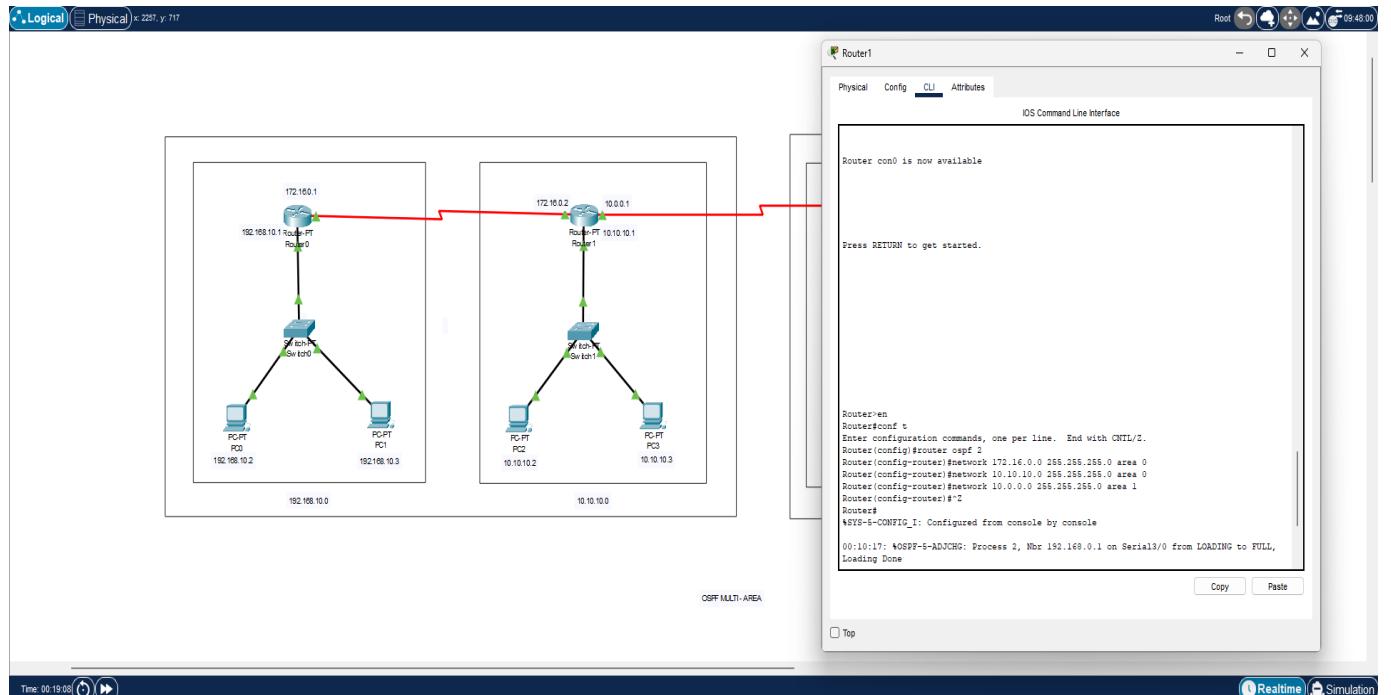
5. **Test Connectivity:**

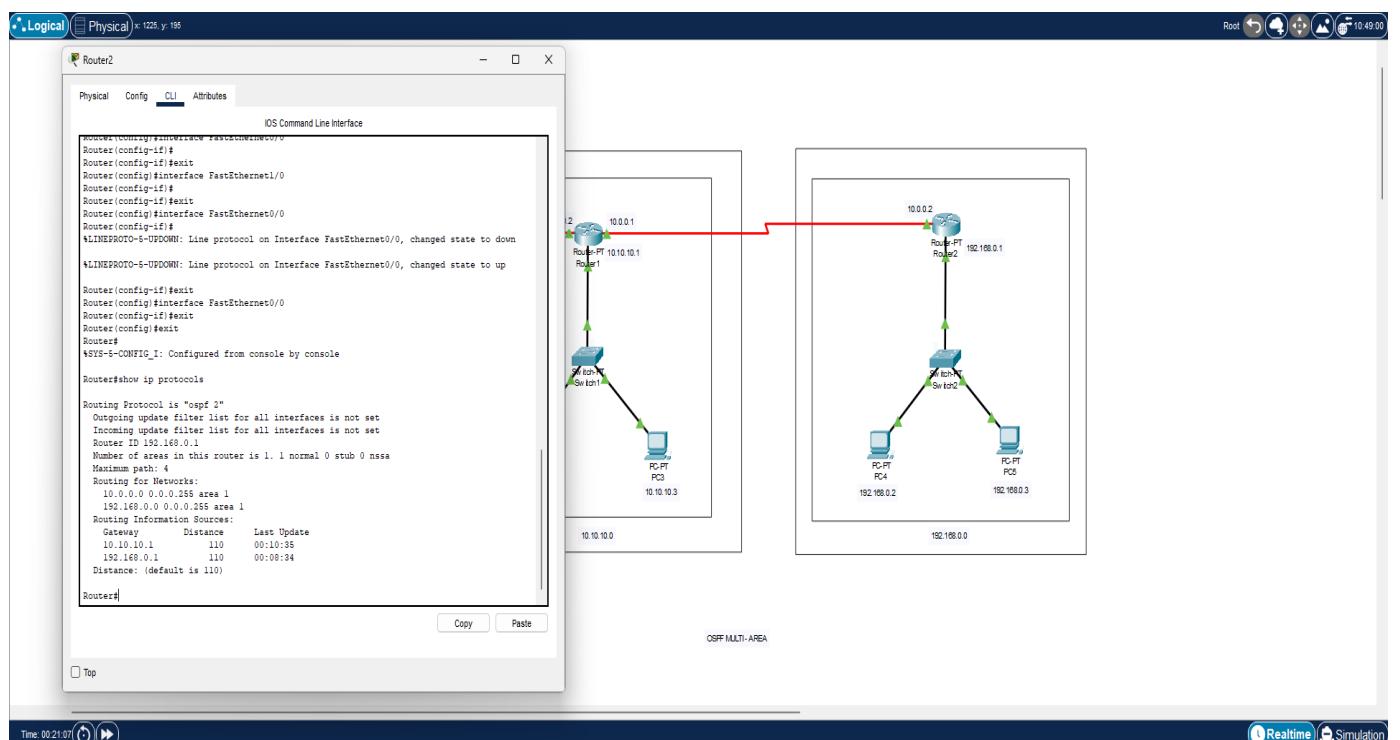
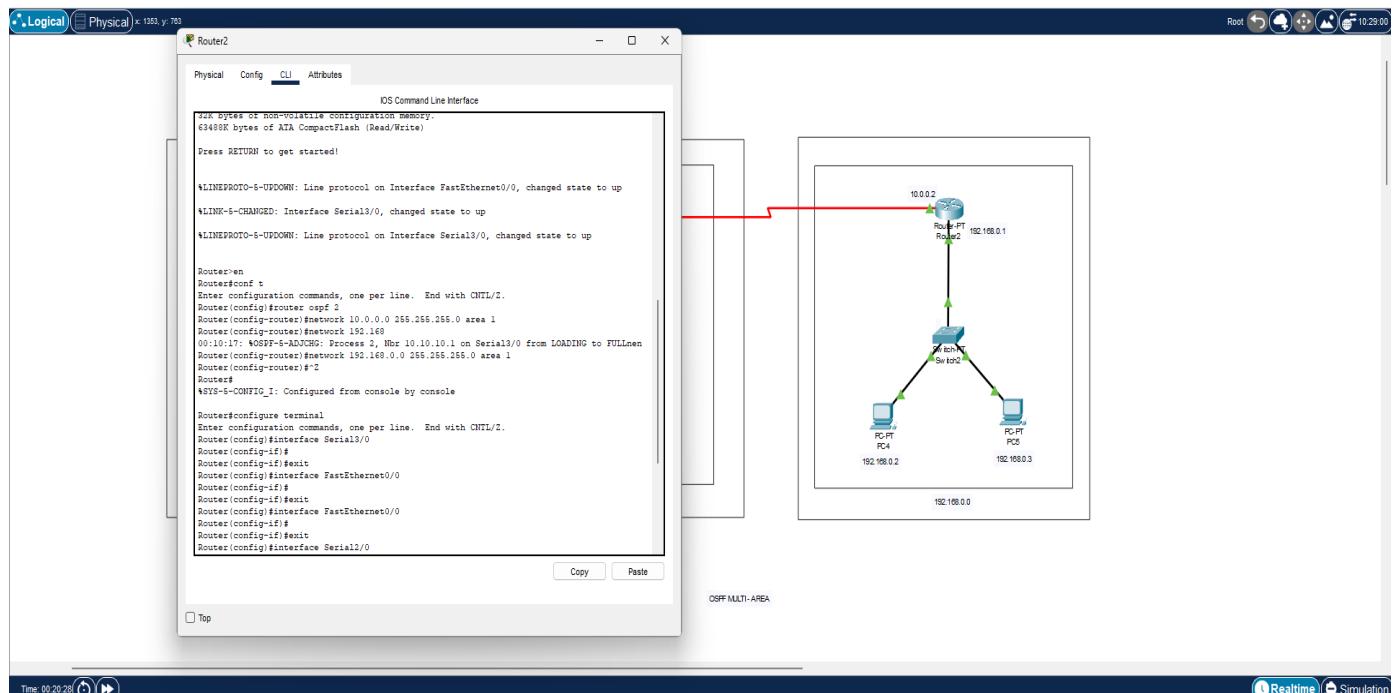
- Use the `ping` command to test connectivity between the computers.

Output:









Lab 11: PPP Configuration

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag two routers onto the workspace and connect them using a serial connection.
- Connect a computer to each router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

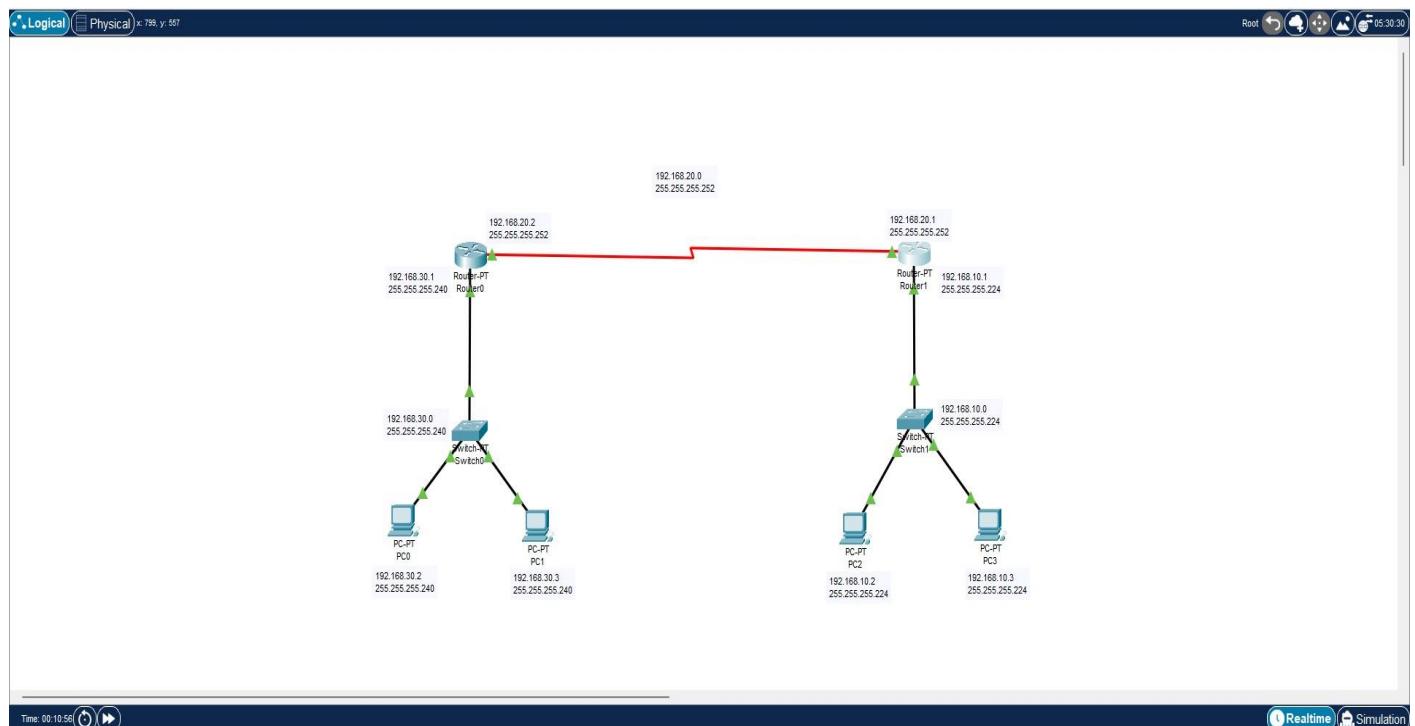
4. **Configure PPP:**

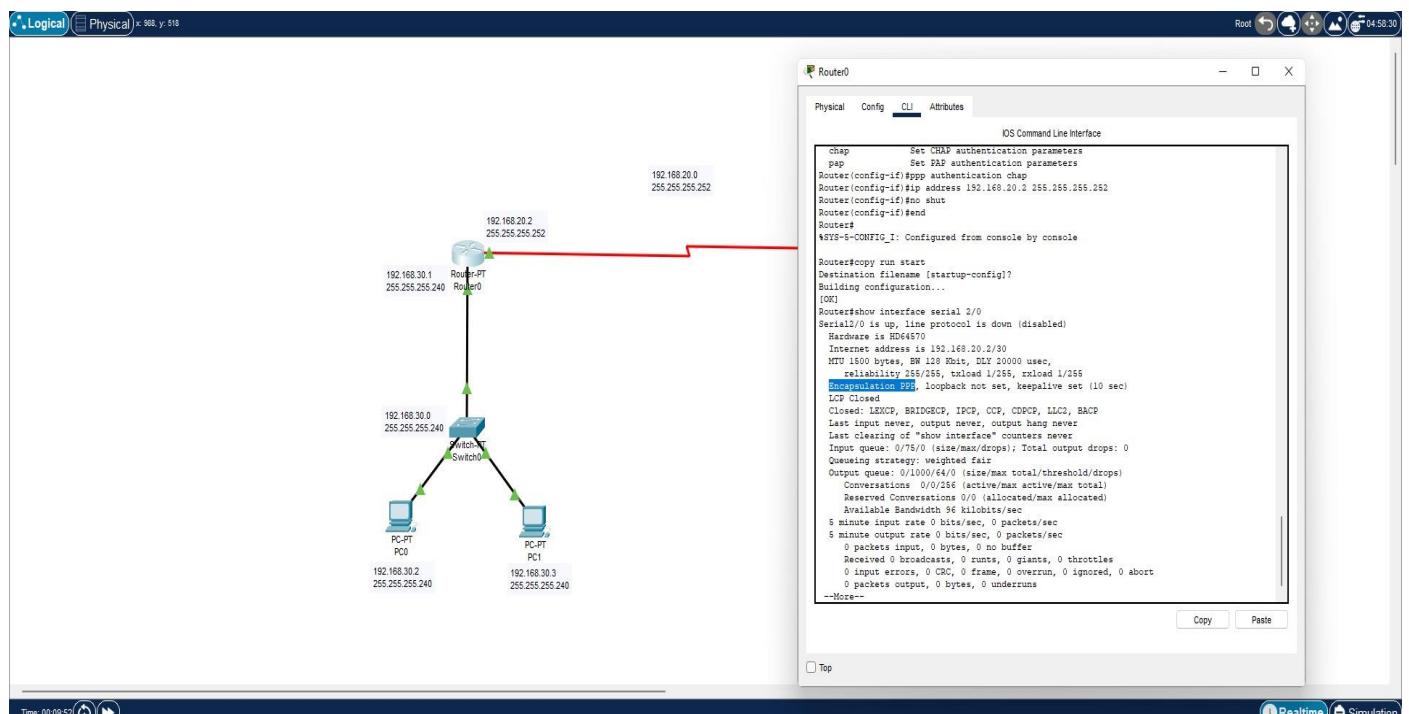
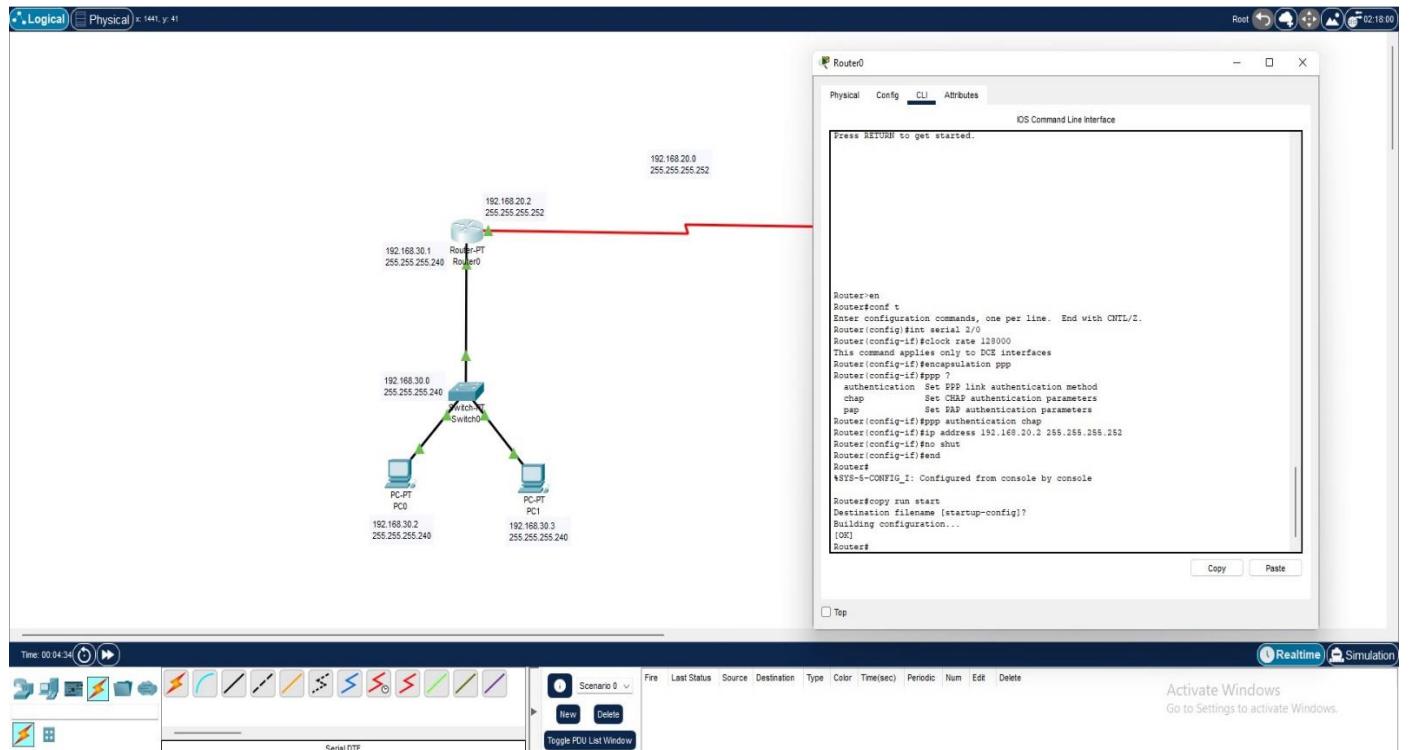
- Access the CLI of each router.
- Enter interface configuration mode for the serial interface: `interface serial 0/0/0`.
- Enable PPP encapsulation: `encapsulation ppp`.

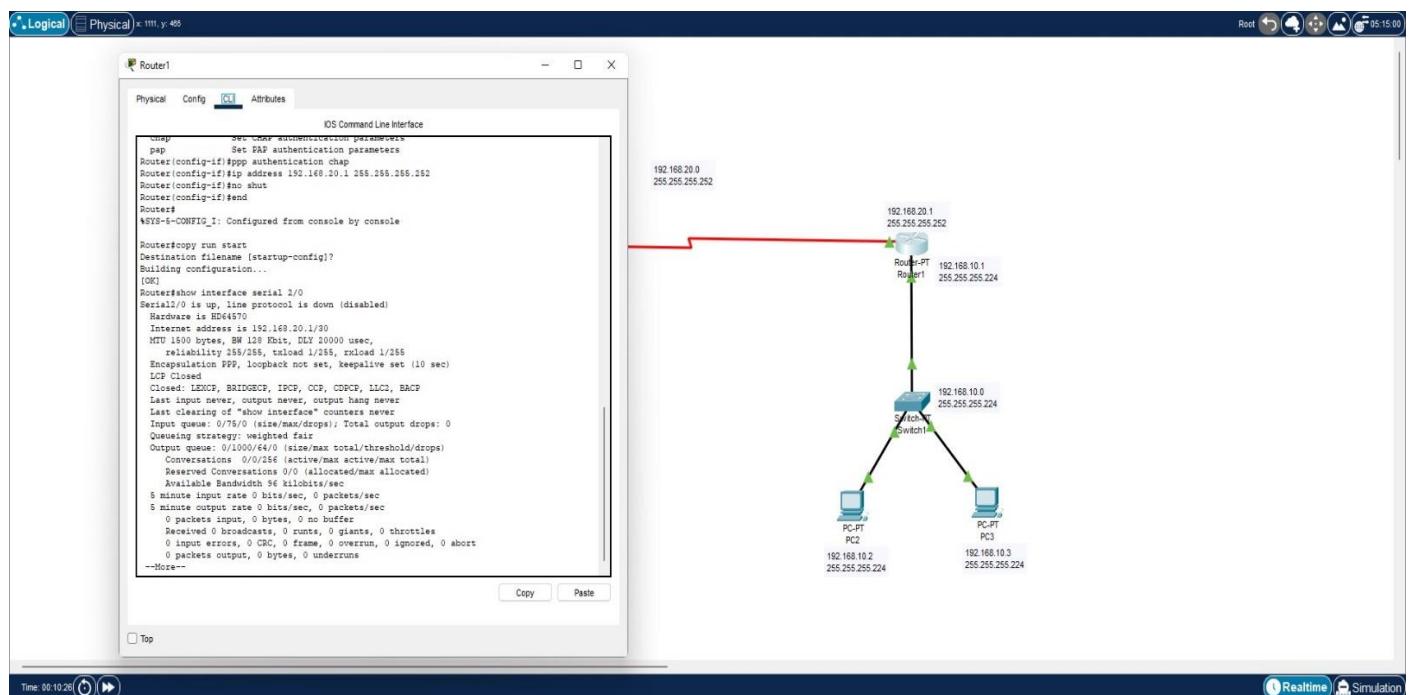
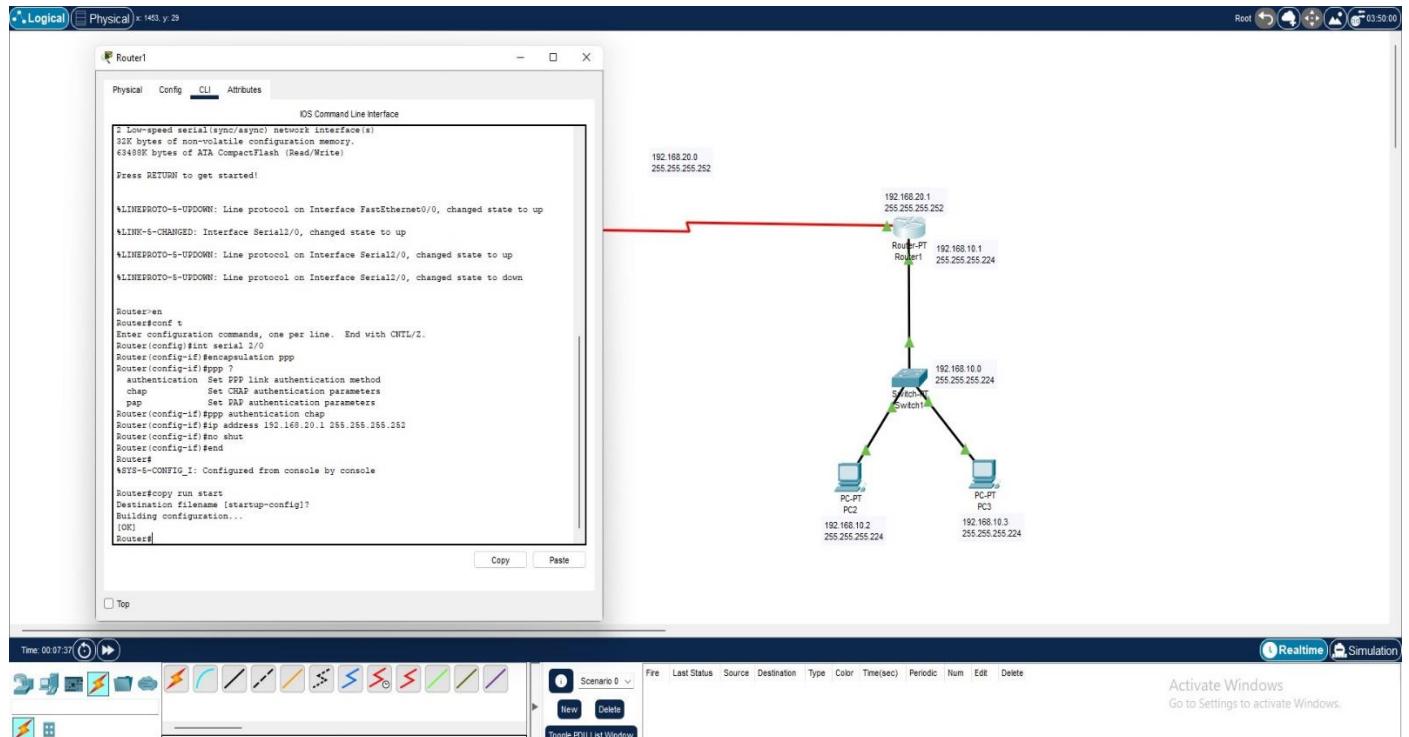
5. **Test Connectivity:**

- Use the `ping` command to test connectivity between the computers.

Output:







Lab 12: HDLC Configuration

- **Procedure:**

1. **Open Packet Tracer:**

- Launch Cisco Packet Tracer on your computer.

2. **Create a Network:**

- Drag two routers onto the workspace and connect them using a serial connection.
- Connect a computer to each router using Ethernet cables.

3. **Configure IP Addresses:**

- Assign IP addresses to each interface on the routers and computers.

4. **Configure HDLC:**

- Access the CLI of each router.
- Enter interface configuration mode for the serial interface: `interface serial 0/0/0`.
- Enable HDLC encapsulation: `encapsulation hdlc`.

5. **Test Connectivity:**

- Use the `ping` command to test connectivity between the computers.

Output:

