

Worksheet – 2.4

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Branch: BE-CSE (LEET)

Section/Group: 809/A

Semester: 4th

Date of Performance: 15/04/2022

Subject Name: Computer Network Lab

Subject Code: 20CSP-257

1. Aim/Overview of the practical:

Create a network to implement Distance Vector routing Protocol using Packet Tracer (RIP).

2. Task to be done/ Which logistics used:

Distance Vector routing Protocol using Packet Tracer (RIP).

Prerequisites:

S/W:

- Laptop/Desktop
- CISCO Packet Tracer program

H/W:

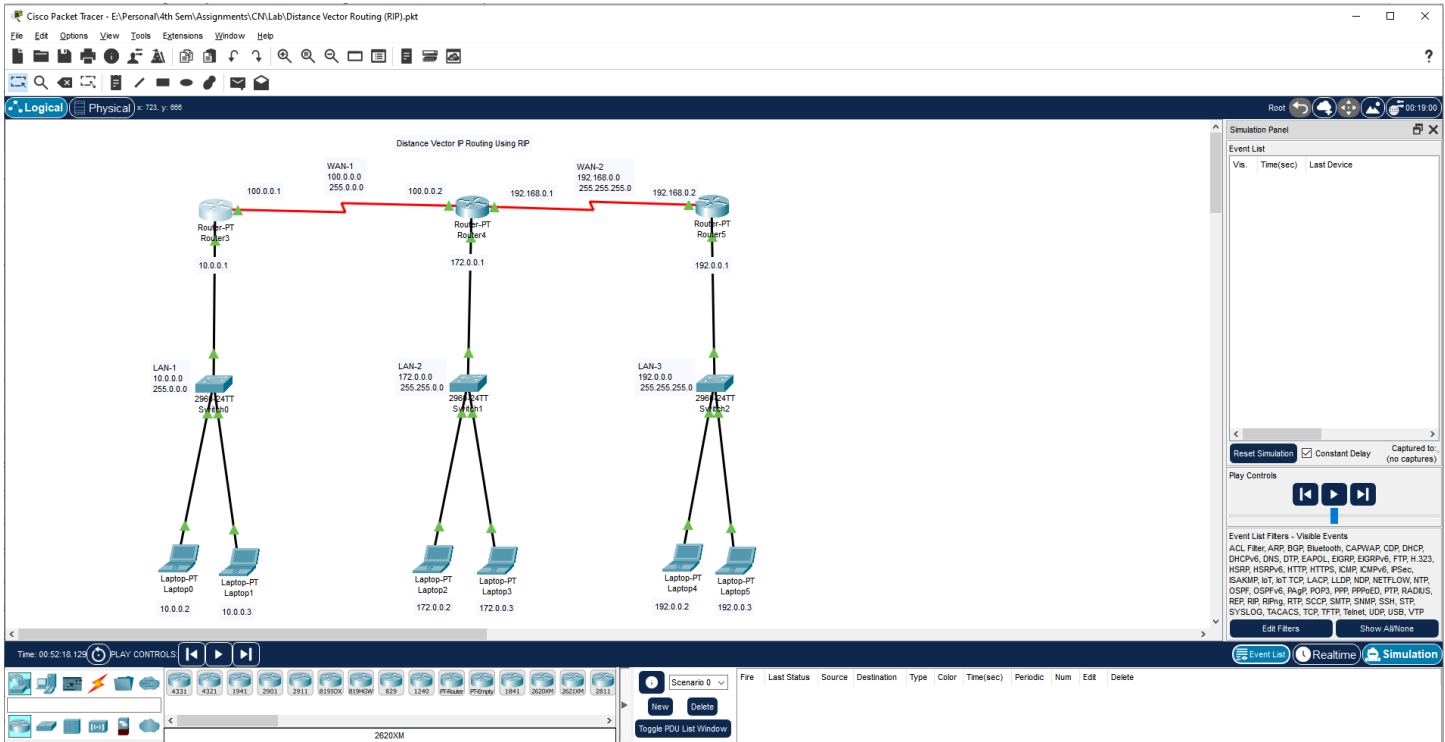
- Main Memory - 128 MB RAM
- Hard Disk – minimum 20 GB IDE Hard Disk
- 44 MB Floppy Disk Drive
- –52X IDE CD-ROM Drive
- PS/2 HCL

3. Steps for experiment/Code with Result/Output:

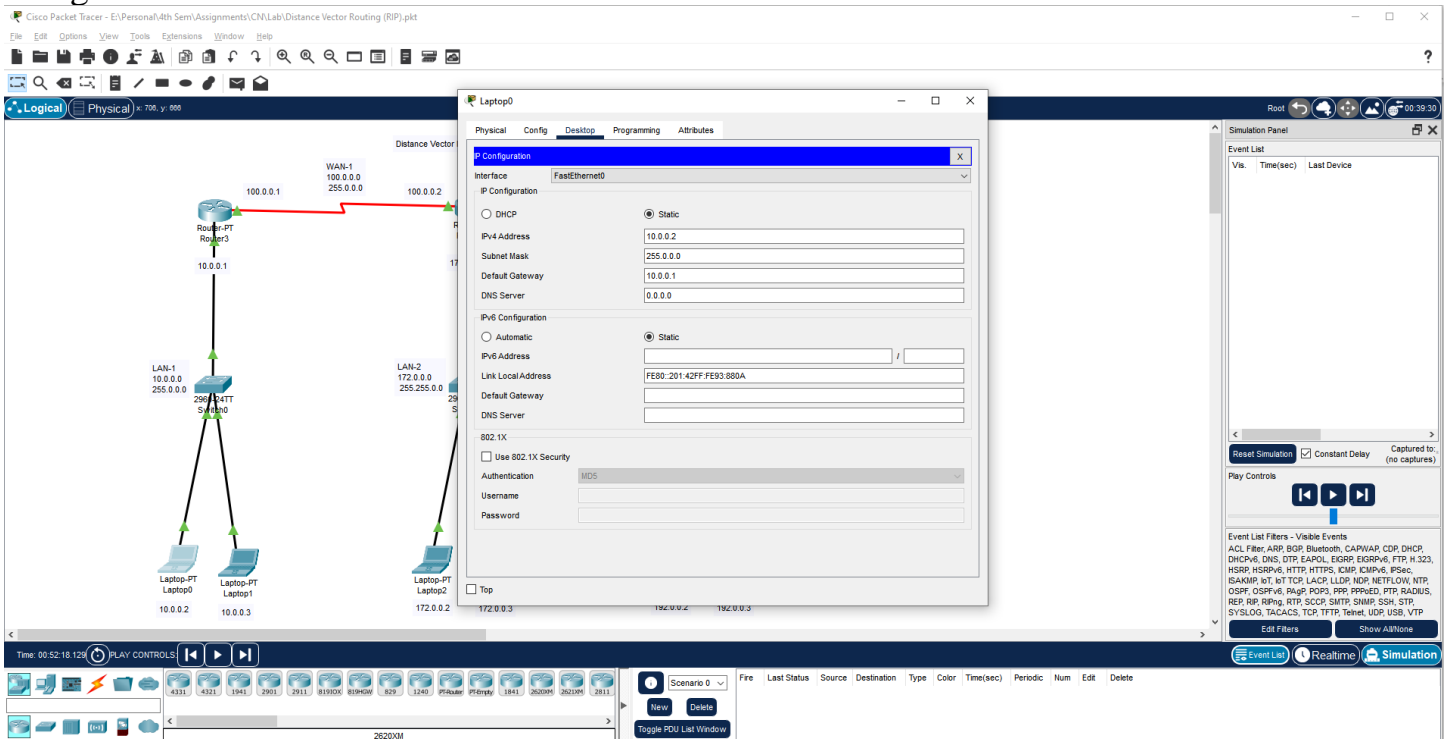
Theory: The Routing Information Protocol (RIP) is one of the oldest distance-vector routing protocols, which employs the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination. The maximum number of hops allowed for RIP is 15. This hop limit, however, also limits the size of networks that RIP can support. A hop count of 16 is considered an infinite distance, in other words the route is considered unreachable.

Procedure:

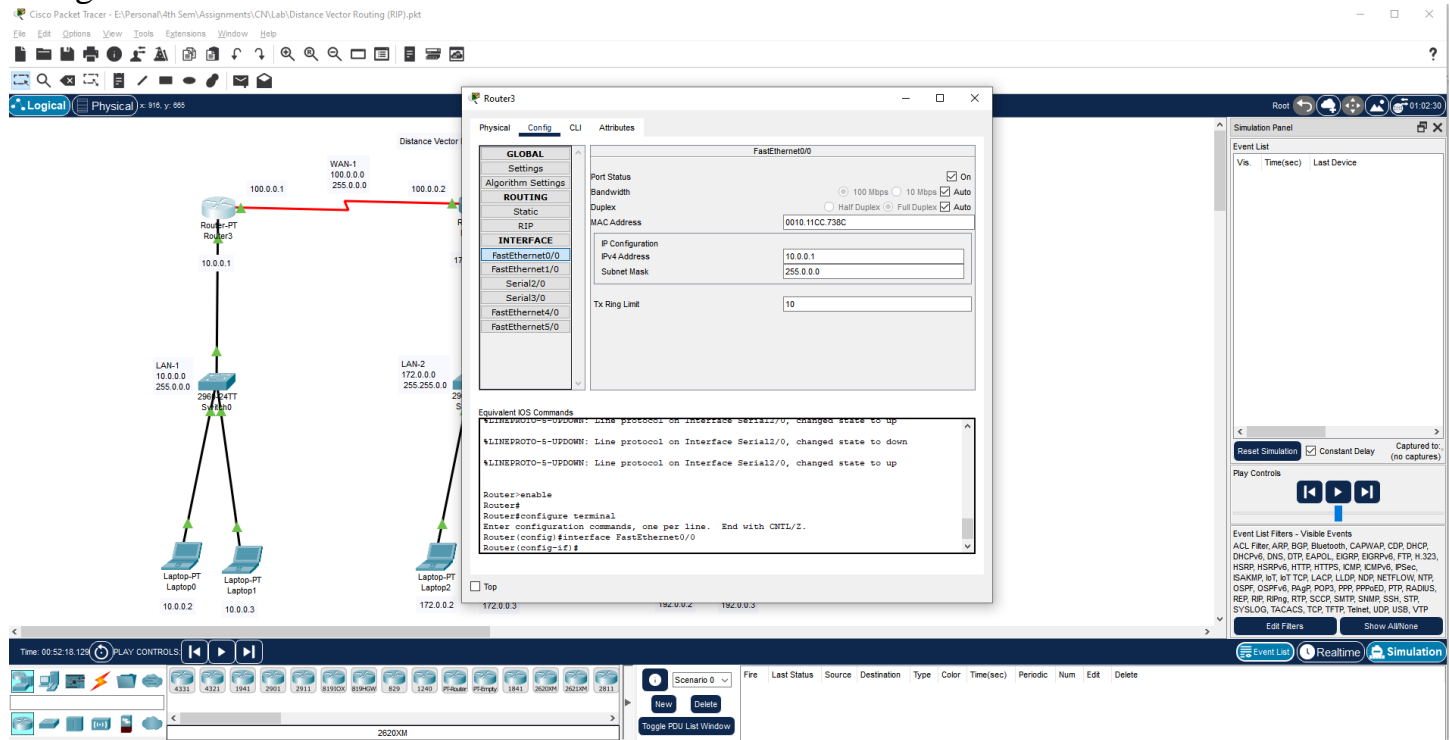
Create the network using 3 router which contains serial port in it.



Assign the IP address for all PC and Router connected to the Switch 0.



Assign the IP address for Router 3.



The screenshot shows the Cisco Packet Tracer interface with a network diagram and the configuration window for Router 3. The network diagram shows Router 3 connected to a switch (Switch 1) via a WAN link (100.0.0.1 to 100.0.0.2). The switch is connected to two laptops (Laptop-PT Laptop0 and Laptop-PT Laptop1) via LAN-1 (10.0.0.0 to 10.0.0.3). The configuration window for Router 3 shows the following settings:

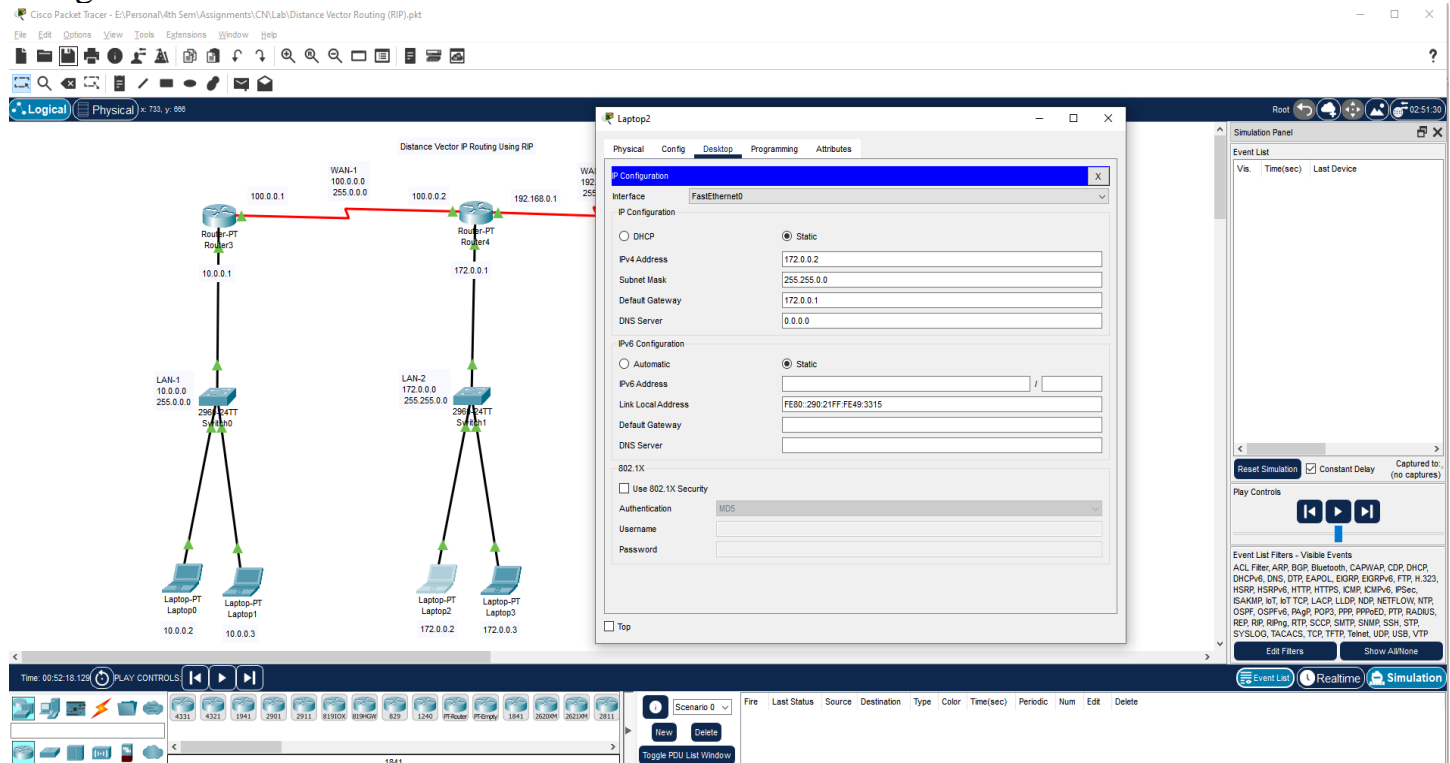
- Global Settings:**
 - Algorithm Settings: Static
 - ROUTING: RIPv1
- Interface Settings:**
 - FastEthernet0/0: IP Address 10.0.0.1, Subnet Mask 255.0.0.0
 - FastEthernet1/0: 10.0.0.2, 255.0.0.0
 - Serial2/0: 10.0.0.3, 255.0.0.0
 - FastEthernet4/0: 10.0.0.4, 255.0.0.0
 - FastEthernet5/0: 10.0.0.5, 255.0.0.0

The Equivalent IOS Commands section shows the following commands:

```

Router>enable
Router>configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#
  
```

Assign the IP address for all PC and Router connected to the Switch 1.



The screenshot shows the Cisco Packet Tracer interface with a network diagram and the configuration window for Laptop 2. The network diagram shows Router 3 connected to a switch (Switch 1) via a WAN link (100.0.0.1 to 100.0.0.2). The switch is connected to two laptops (Laptop-PT Laptop0 and Laptop-PT Laptop1) via LAN-1 (10.0.0.0 to 10.0.0.3). The configuration window for Laptop 2 shows the following settings:

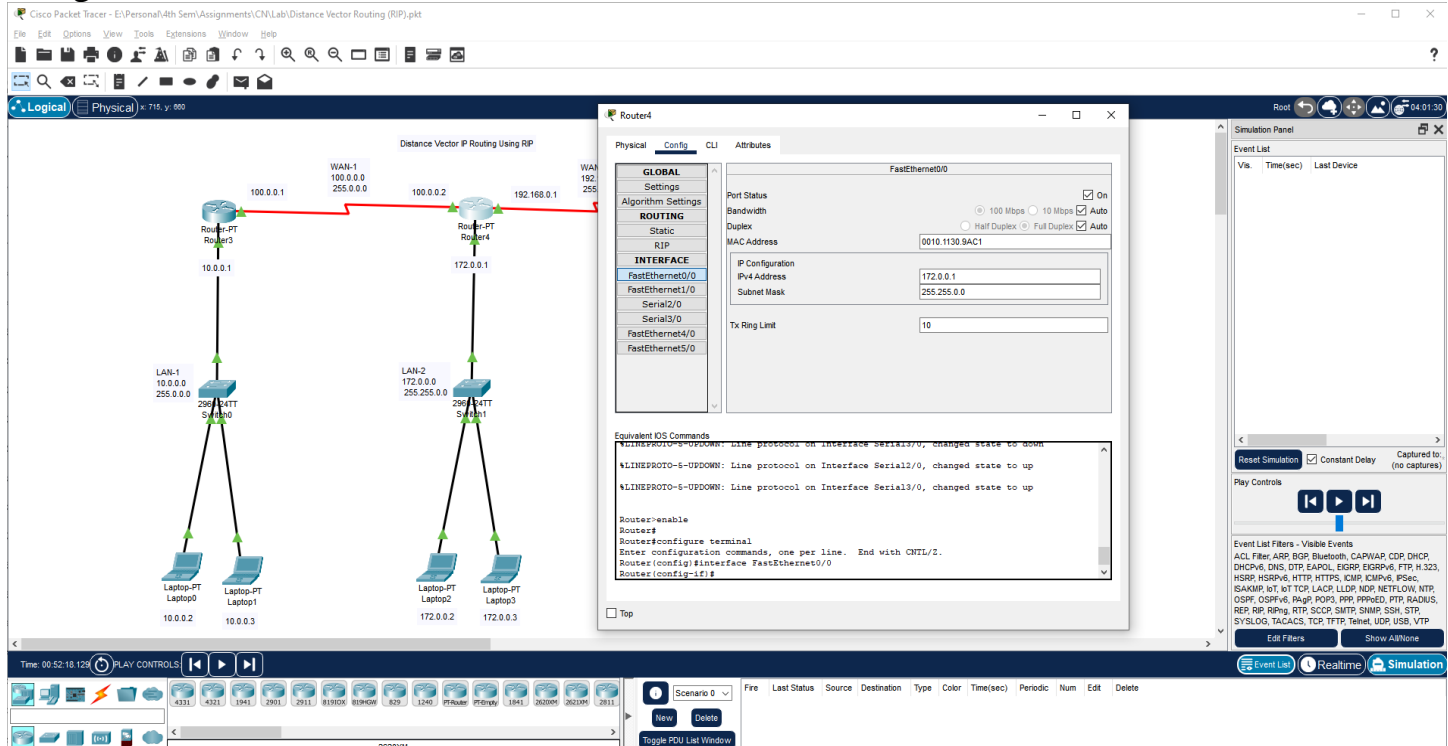
- IP Configuration:**
 - Interface: FastEthernet0
 - Static: 172.0.0.2, 255.255.0.0
 - Default Gateway: 172.0.0.1
 - DNS Server: 0.0.0.0
- IPv6 Configuration:**
 - Static: FE80:290:21FF:FE49:3315
 - Link Local Address: FE80:290:21FF:FE49:3315
 - Default Gateway: FE80:290:21FF:FE49:3315
 - DNS Server: FE80:290:21FF:FE49:3315

The Equivalent IOS Commands section shows the following commands:

```

Router>enable
Router>configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#
  
```

Assign the IP address for Router 4.



The screenshot shows the Cisco Packet Tracer interface with a network diagram and the configuration window for Router4.

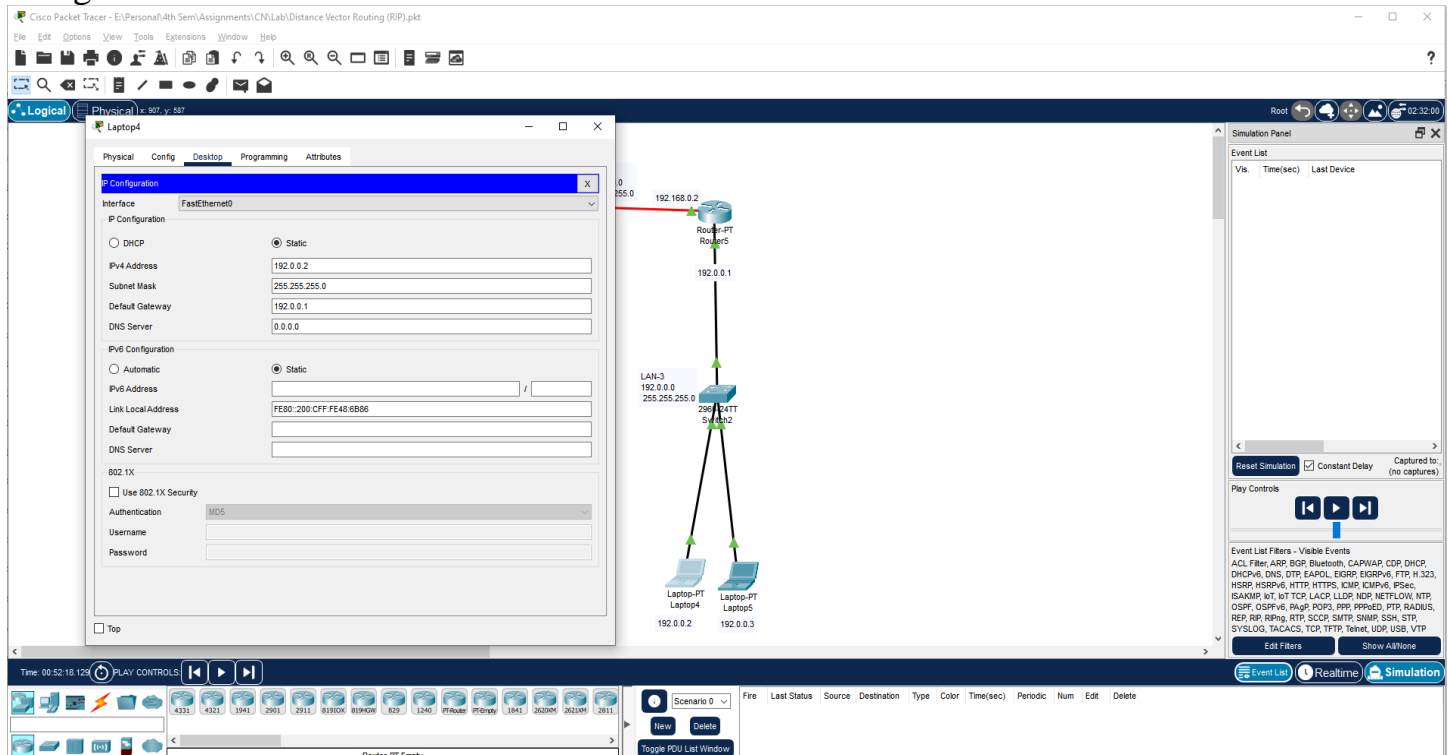
Network Diagram: The diagram shows two routers, Router3 and Router4, connected via a WAN link. Router3 has a WAN interface with IP 100.0.0.1 and a LAN interface with IP 10.0.0.1. Router4 has a WAN interface with IP 192.168.0.1 and a LAN interface with IP 172.0.0.1. Both routers are connected to two switches, Switch1 and Switch2, which are connected to four laptops each. The laptops are labeled Laptop-PT Laptop0 through Laptop-PT Laptop7.

Router4 Configuration Window: The configuration window for Router4 is open, showing the configuration for the FastEthernet0/0 interface. The IP address is set to 172.0.0.1 and the subnet mask is 255.255.0.0. The configuration window also shows the equivalent IOS commands:

```

Router#enable
Router#configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#
  
```

Assign the IP address for all PC and Router connected to the Switch 2.



The screenshot shows the Cisco Packet Tracer interface with a network diagram and the configuration window for Laptop4.

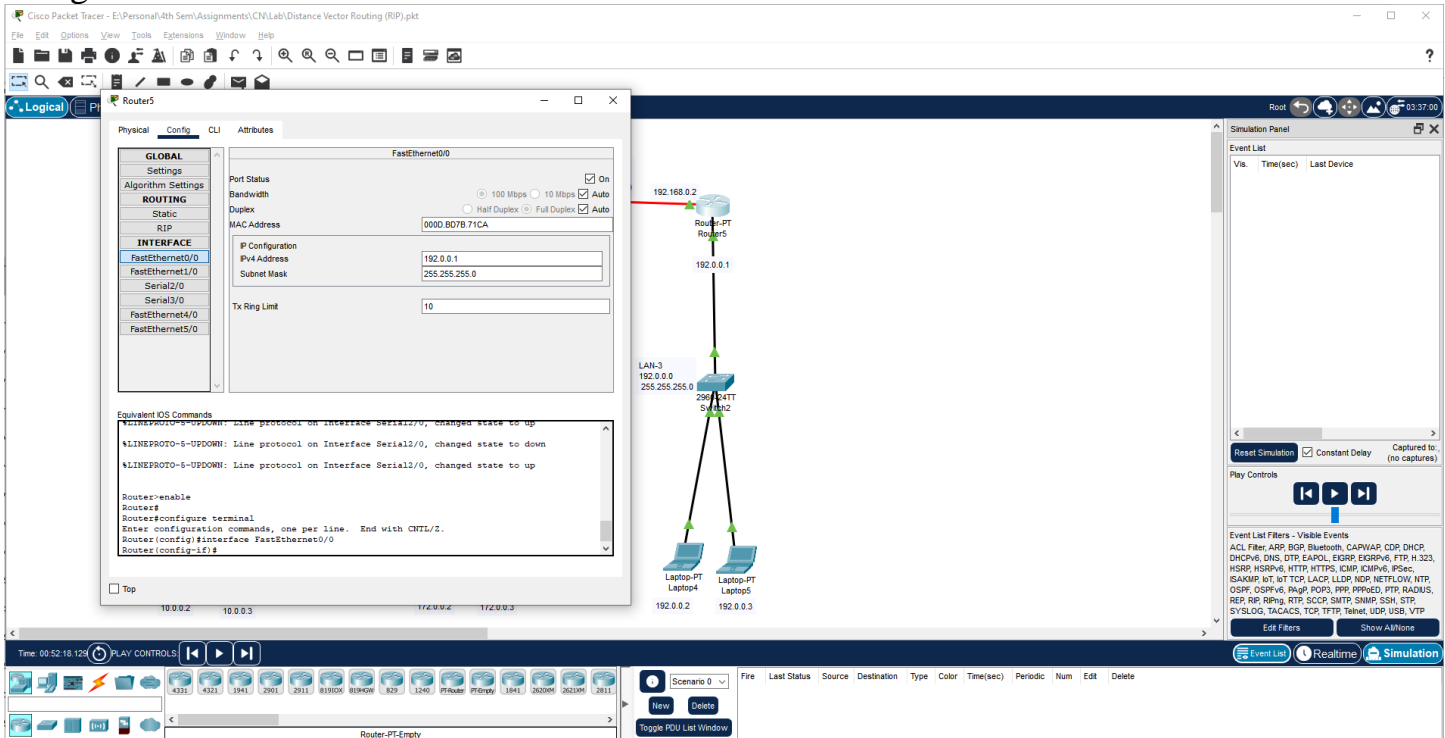
Network Diagram: The diagram shows a single router, Router3, connected to a switch, Switch2, which is connected to two laptops, Laptop4 and Laptop5. The router has a WAN interface with IP 192.168.0.1 and a LAN interface with IP 192.0.0.1. The switch has a LAN interface with IP 192.0.0.0 and a WAN interface with IP 192.168.0.2. The laptops are labeled Laptop-PT Laptop4 and Laptop-PT Laptop5.

Laptop4 Configuration Window: The configuration window for Laptop4 is open, showing the configuration for the FastEthernet0 interface. The IP address is set to 192.0.0.2 and the subnet mask is 255.255.255.0. The configuration window also shows the equivalent IOS commands:

```

Laptop4#enable
Laptop4#configure terminal
Laptop4(config)#interface FastEthernet0
Laptop4(config-if)#
  
```

Assign the IP address for Router 5.



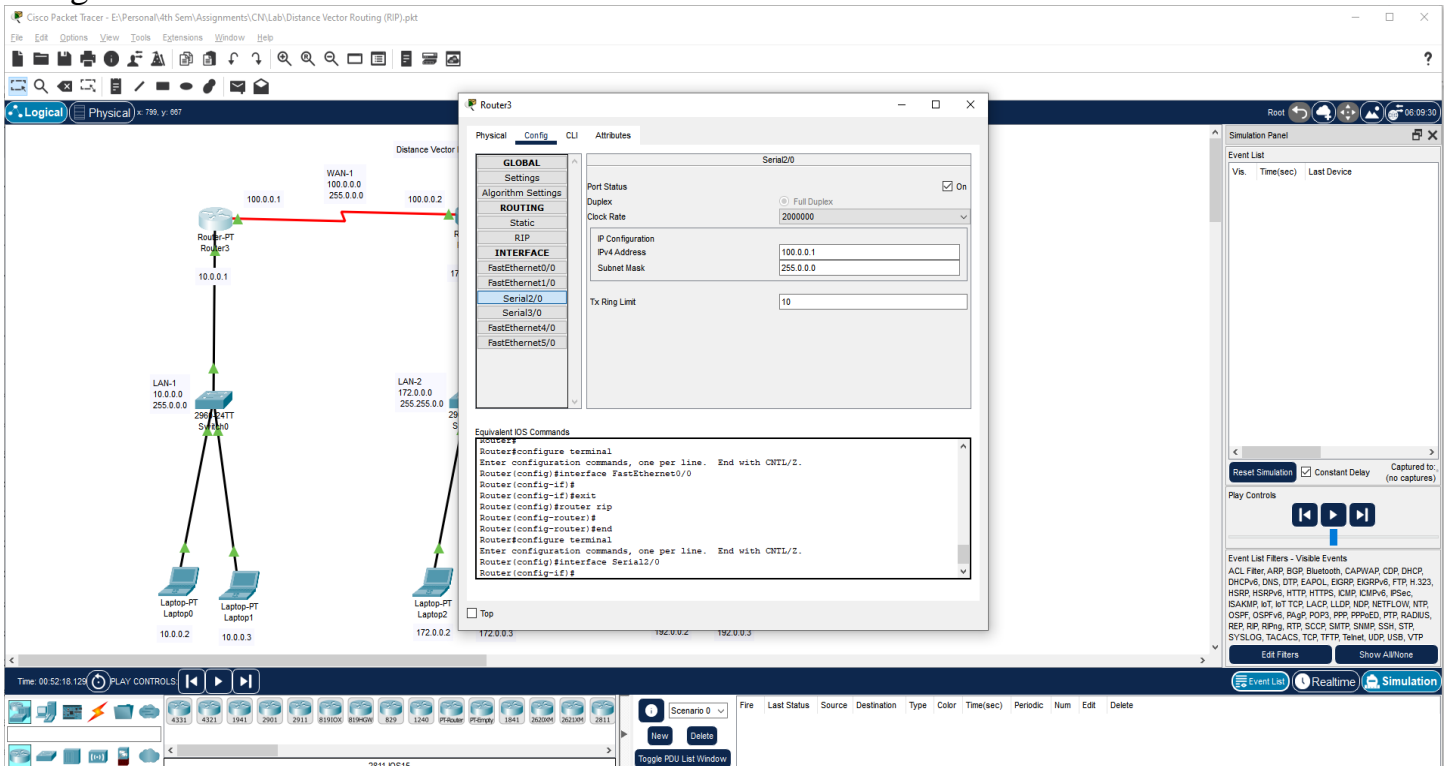
The screenshot shows the Cisco Packet Tracer interface with the configuration window for Router 5 open. The 'Config' tab is selected, and the 'FastEthernet0/0' interface is being configured. The IP address is set to 192.0.0.1 and the subnet mask is 255.255.255.0. The 'Equivalent IOS Commands' section shows the following commands:

```

Router>enable
Router#
Router(config)#interface FastEthernet0/0
Router(config-if)#
  
```

The network diagram shows Router 5 connected to a LAN-3 (192.0.0.0/24) and two laptops (Laptop-PT Laptop0 and Laptop-PT Laptop1) with IP addresses 192.0.0.2 and 192.0.0.3 respectively.

Assign the IP address for Serial Ports of Router 3.



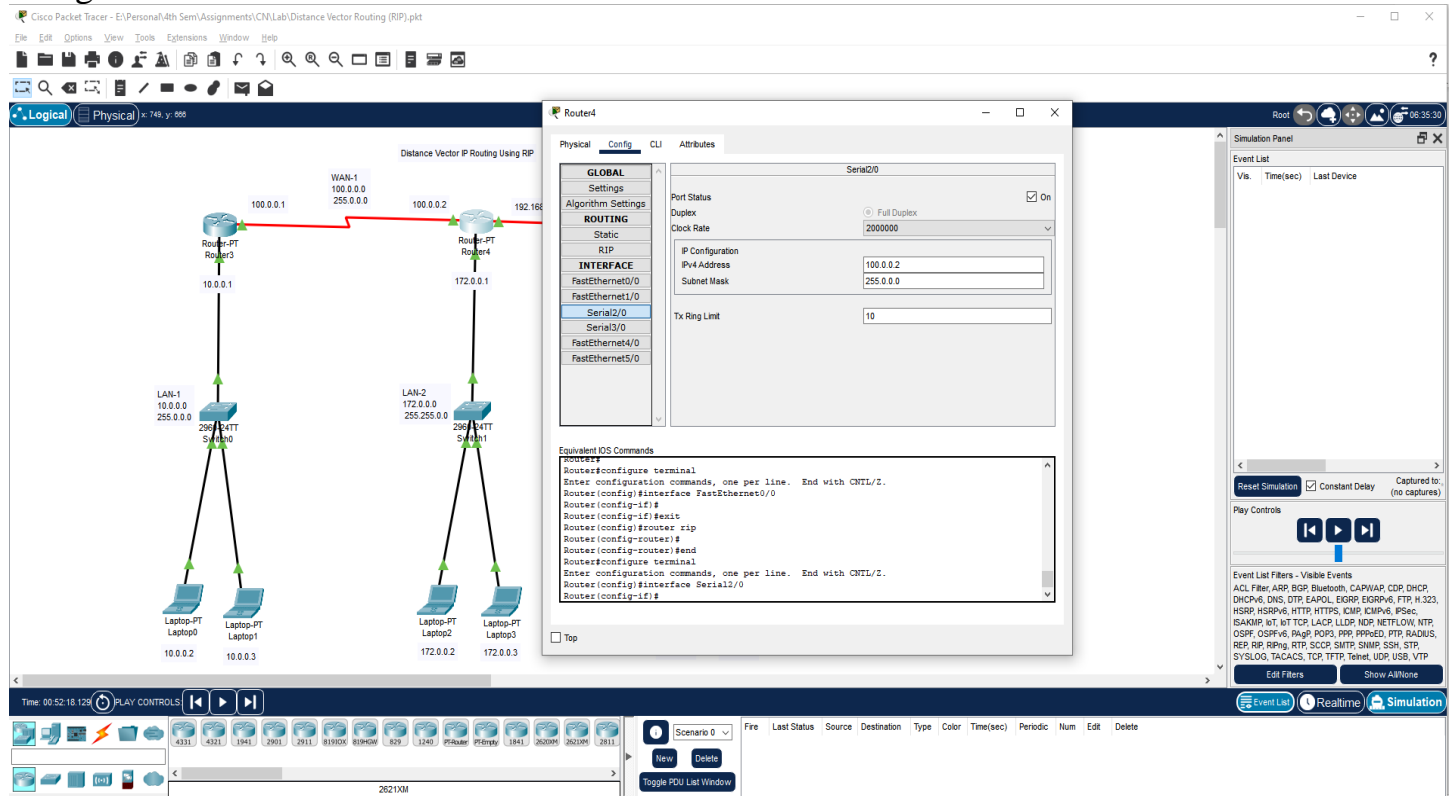
The screenshot shows the Cisco Packet Tracer interface with the configuration window for Router 3 open. The 'Config' tab is selected, and the 'Serial2/0' interface is being configured. The IP address is set to 100.0.0.1 and the subnet mask is 255.0.0.0. The 'Equivalent IOS Commands' section shows the following commands:

```

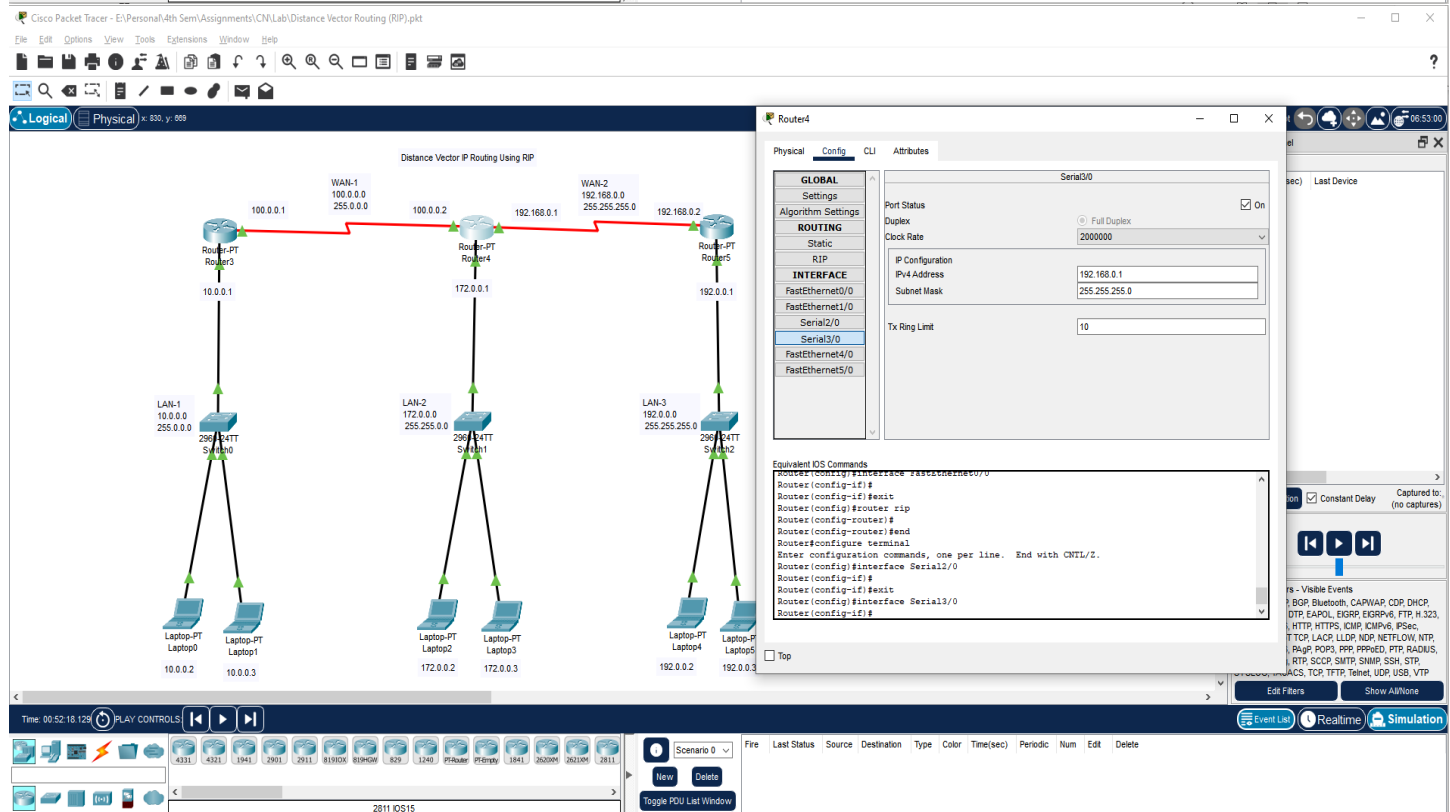
Router>configure terminal
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#ip address 100.0.0.1 255.0.0.0
Router(config-if)#end
  
```

The network diagram shows Router 3 connected to a WAN-1 (100.0.0.0/24) and two laptops (Laptop-PT Laptop0 and Laptop-PT Laptop1) with IP addresses 10.0.0.2 and 10.0.0.3 respectively.

Assign the IP address for Serial Ports of Router 4.

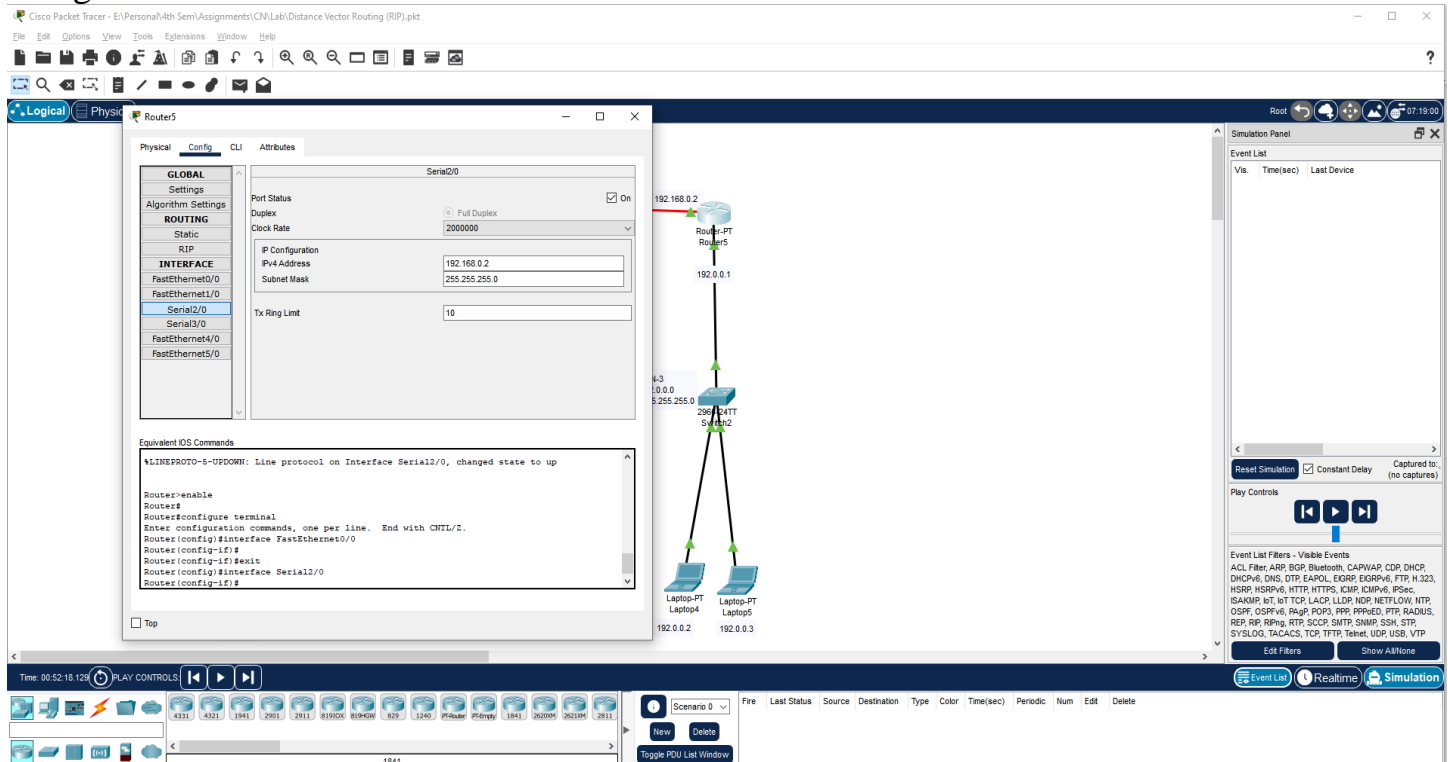


This screenshot shows the initial network configuration in Cisco Packet Tracer. The network consists of three routers (Router-PT Router3, Router-PT Router4, and Router-PT Router5) connected via their Serial0/0 ports. Router3 is connected to Router4 with IP 100.0.0.1, and Router4 is connected to Router5 with IP 192.168.0.1. Each router has two LANs connected to it. The configuration window for Router4 is open, showing the Serial0/0 interface settings. The IP Configuration section shows the IP Address set to 100.0.0.2 and the Subnet Mask set to 255.0.0.0. The Equivalent IOS Commands section shows the configuration commands for Router4.



This screenshot shows the final network configuration in Cisco Packet Tracer. The network consists of three routers (Router-PT Router3, Router-PT Router4, and Router-PT Router5) connected via their Serial0/0 ports. Router3 is connected to Router4 with IP 100.0.0.1, and Router4 is connected to Router5 with IP 192.168.0.1. Each router has two LANs connected to it. The configuration window for Router4 is open, showing the Serial0/0 interface settings. The IP Configuration section shows the IP Address set to 192.168.0.1 and the Subnet Mask set to 255.255.255.0. The Equivalent IOS Commands section shows the configuration commands for Router4.

Assign the IP address for Serial Ports of Router 5.



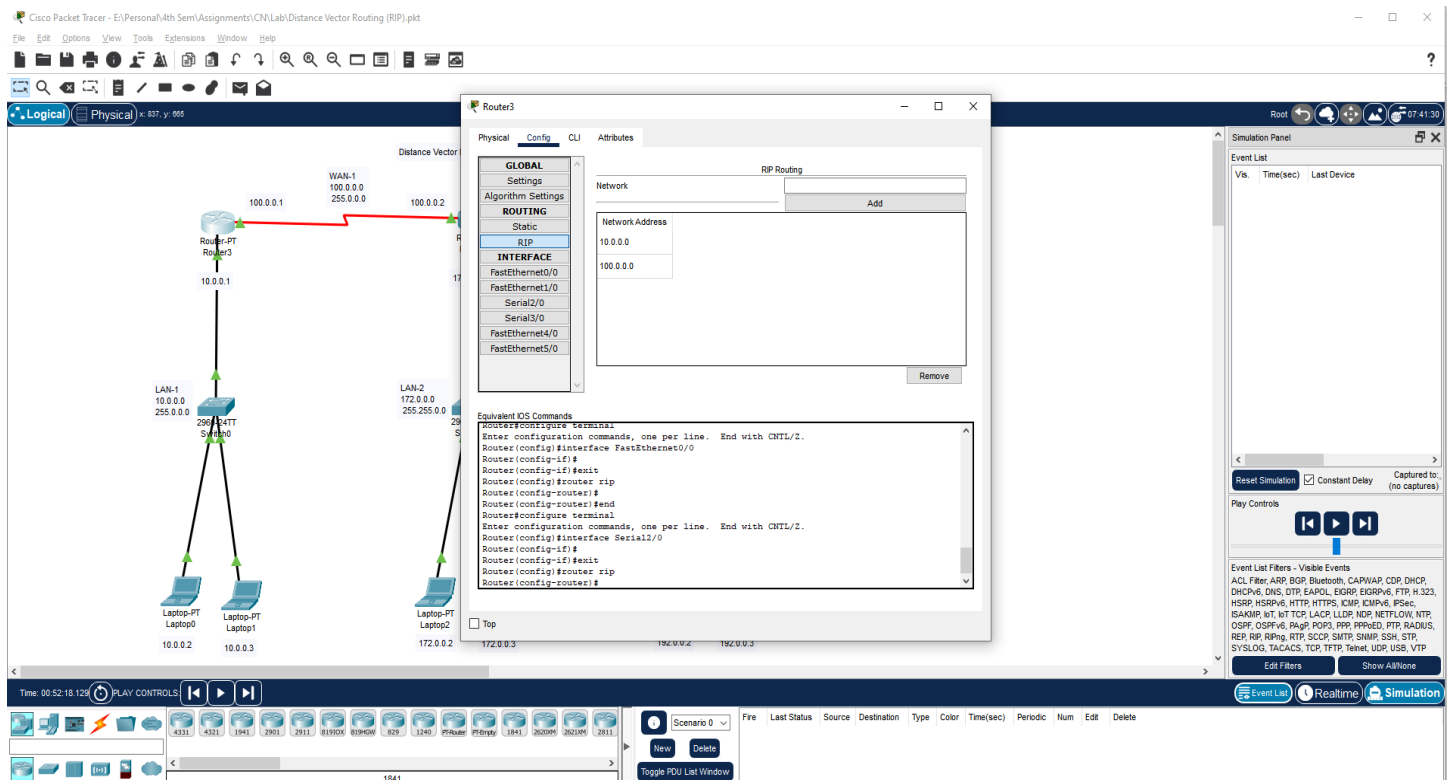
The screenshot shows the Cisco Packet Tracer interface with Router 5 selected. The 'Config' tab is active, and the 'Serial2/0' interface is being configured. The 'P Configuration' section shows the IP address set to 192.168.0.2 and the Subnet Mask set to 255.255.255.0. The 'Equivalent IOS Commands' window displays the following commands:

```

Router#enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
  
```

The network diagram shows Router 5 connected to a central router (2961-KAT) which is connected to two laptops (Laptop4 and Laptop5). The central router has IP 192.0.0.1 on its Serial0/0 interface. Laptop4 has IP 192.0.0.2 and Laptop5 has IP 192.0.0.3.

Add the RIP Network in Router 3.



The screenshot shows the Cisco Packet Tracer interface with Router 3 selected. The 'Config' tab is active, and the 'RIP Routing' section is being configured. The 'Network' section shows the following configuration:

```

Network
10.0.0.0
100.0.0.0
  
```

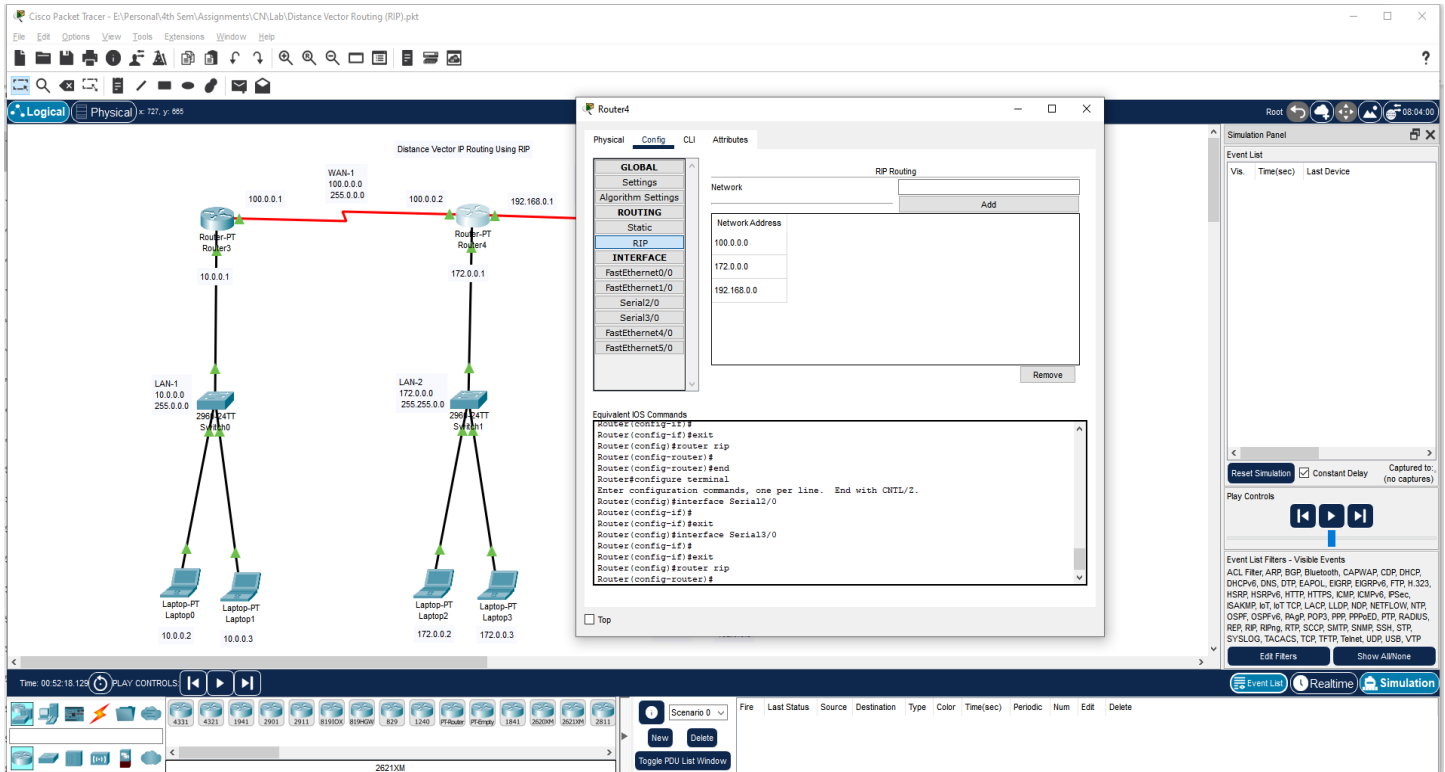
The 'Equivalent IOS Commands' window displays the following commands:

```

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
  
```

The network diagram shows Router 3 connected to Router 5 via a WAN link (100.0.0.1 to 100.0.0.2). Router 3 has LAN-1 (10.0.0.0/24) and LAN-2 (172.0.0.0/24) connected to two laptops (Laptop0 and Laptop1). Router 5 has LAN-1 (10.0.0.0/24) and LAN-2 (172.0.0.0/24) connected to two laptops (Laptop2 and Laptop3).

Add the RIP Network in Router 4.



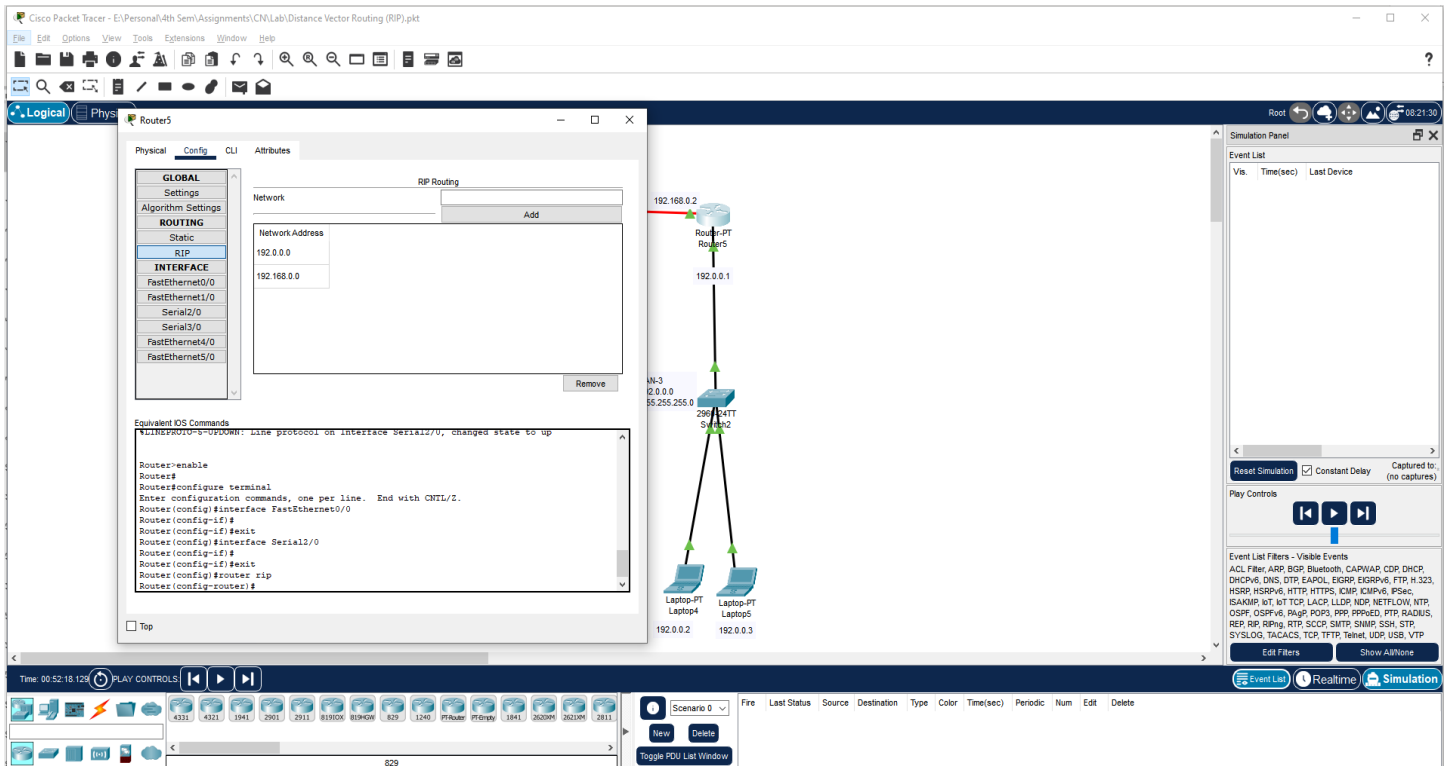
Router 4 Configuration:

```

Router(config)#ip routing
Router(config)#router rip
Router(config-router)#network 100.0.0.0
Router(config-router)#network 172.0.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#exit

```

Add the RIP Network in Router 5.



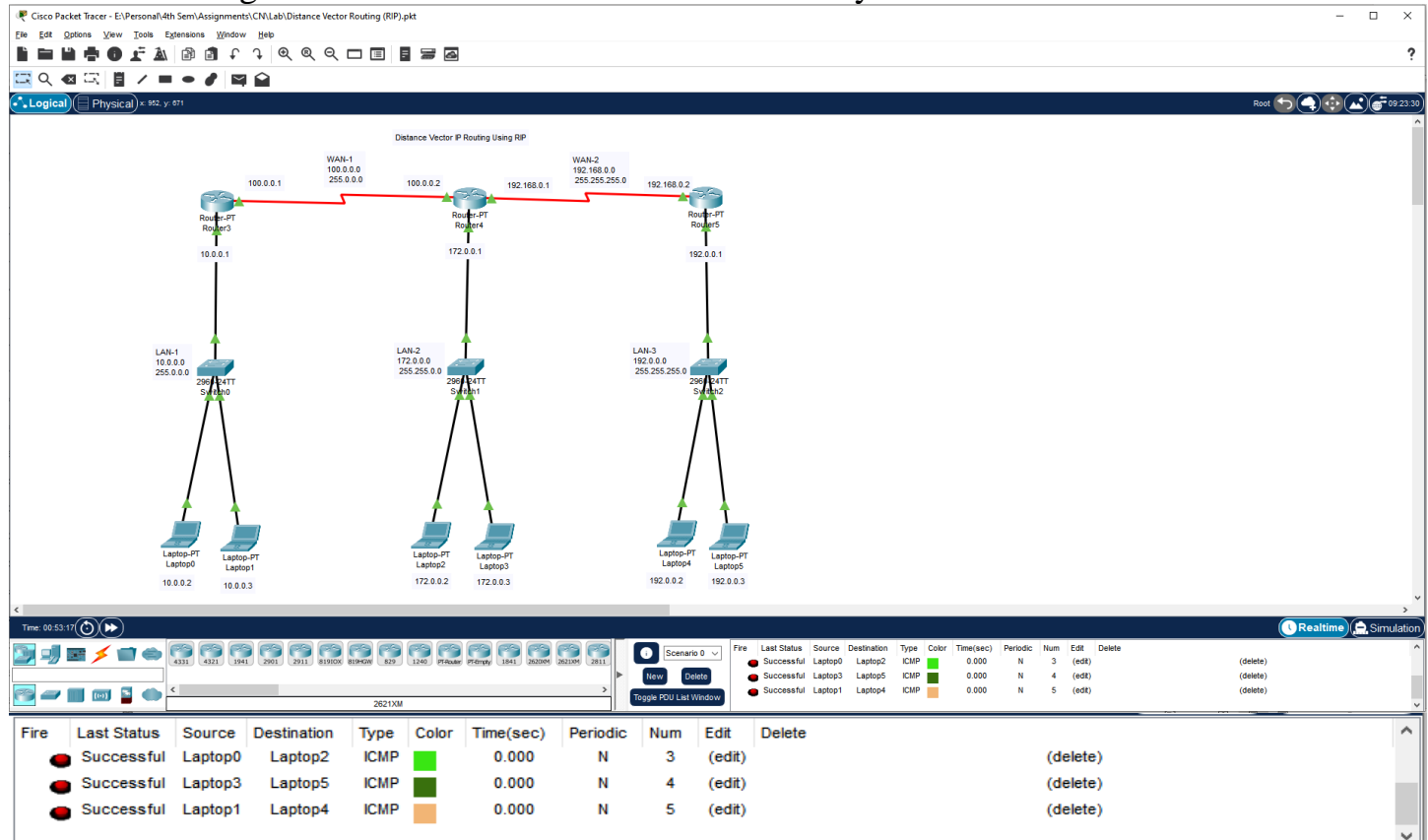
Router 5 Configuration:

```

Router5(config)#ip routing
Router5(config)#router rip
Router5(config-router)#network 192.0.0.0
Router5(config-router)#network 192.168.0.0
Router5(config-router)#exit

```

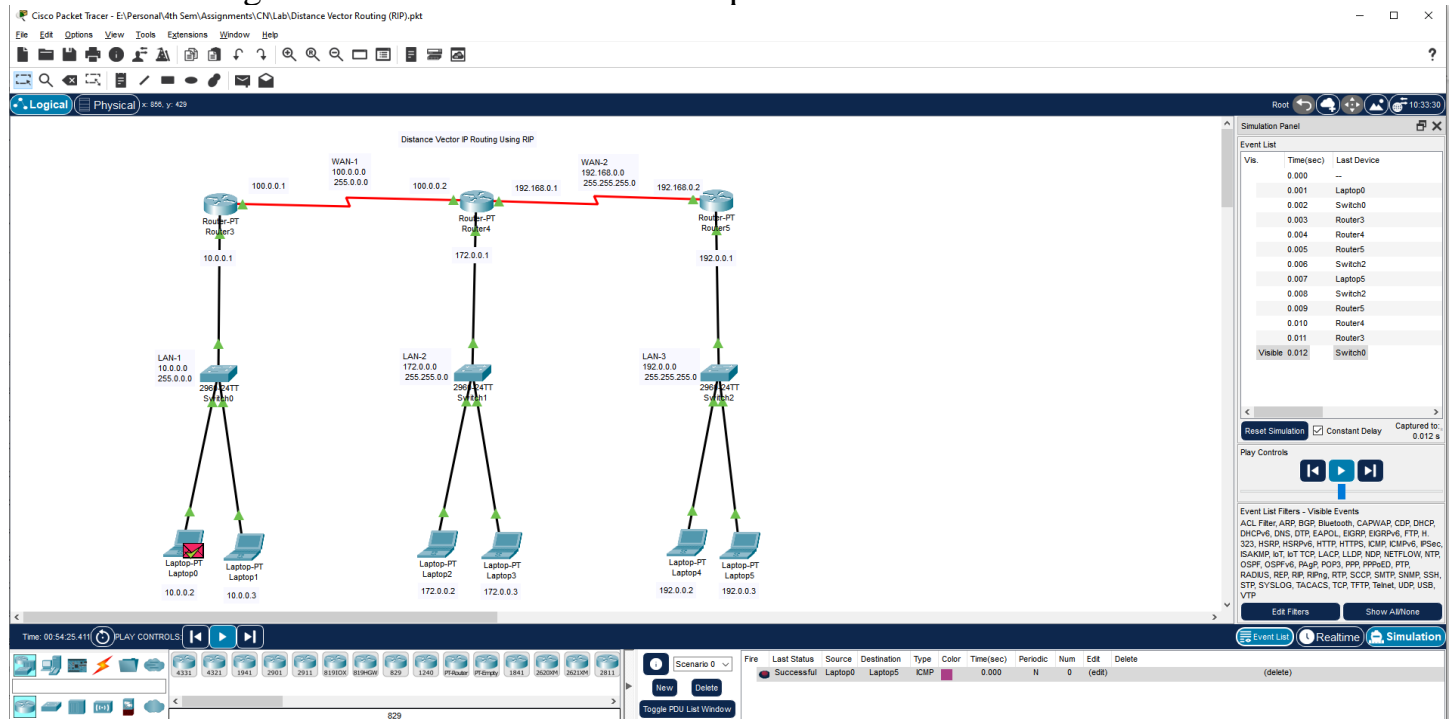

Send the Message in Realtime and Check the Connectivity.



The screenshot shows the Cisco Packet Tracer interface in Realtime mode. The network topology consists of three routers (R1, R2, R3) connected in a line. R1 is connected to R2 via WAN-1 (100.0.0.0/24), and R2 is connected to R3 via WAN-2 (192.168.0.0/24). Each router has a LAN interface connected to a switch (S1, S2, S3), which in turn is connected to two laptops (L1, L2; L3, L4; L5, L6). The IP addresses for the LANs are 10.0.0.0/24, 172.0.0.0/24, and 192.0.0.0/24 respectively. The Realtime mode is selected, and the simulation is running. The bottom panel shows the command history and the output of the 'ping' command, indicating successful connectivity between the laptops.

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|------------|-------------|---------|-------------|--------|-------|-----------|----------|--------|----------|--------|
| Successful | Laptop0 | Laptop2 | ICMP | Green | 0.000 | N | 3 | (edit) | (delete) | |
| Successful | Laptop3 | Laptop5 | ICMP | Green | 0.000 | N | 4 | (edit) | (delete) | |
| Successful | Laptop1 | Laptop4 | ICMP | Orange | 0.000 | N | 5 | (edit) | (delete) | |

Send the Message in Simulation and See the Steps.



The screenshot shows the Cisco Packet Tracer interface in Simulation mode. The network topology is the same as in the Realtime mode. The Simulation mode is selected, and the simulation is running. The bottom panel shows the command history and the output of the 'ping' command, indicating successful connectivity between the laptops. The Simulation Panel on the right shows the Event List, which displays the sequence of events occurring during the simulation, including the successful completion of the ping command.

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|------------|-------------|---------|-------------|--------|-------|-----------|----------|--------|----------|--------|
| Successful | Laptop0 | Laptop5 | ICMP | Purple | 0.000 | N | 0 | (edit) | (delete) | |

Learning outcomes (What I have learnt):

1. Understand working of Distance Vector Routing using RIP.
2. Create and Executed all process of Distance Vector Routing using RIP.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

| Sr. No. | Parameters | Marks Obtained | Maximum Marks |
|---------|------------|----------------|---------------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| | | | |