



## 1.4 Design a Ring topology with switches and routers

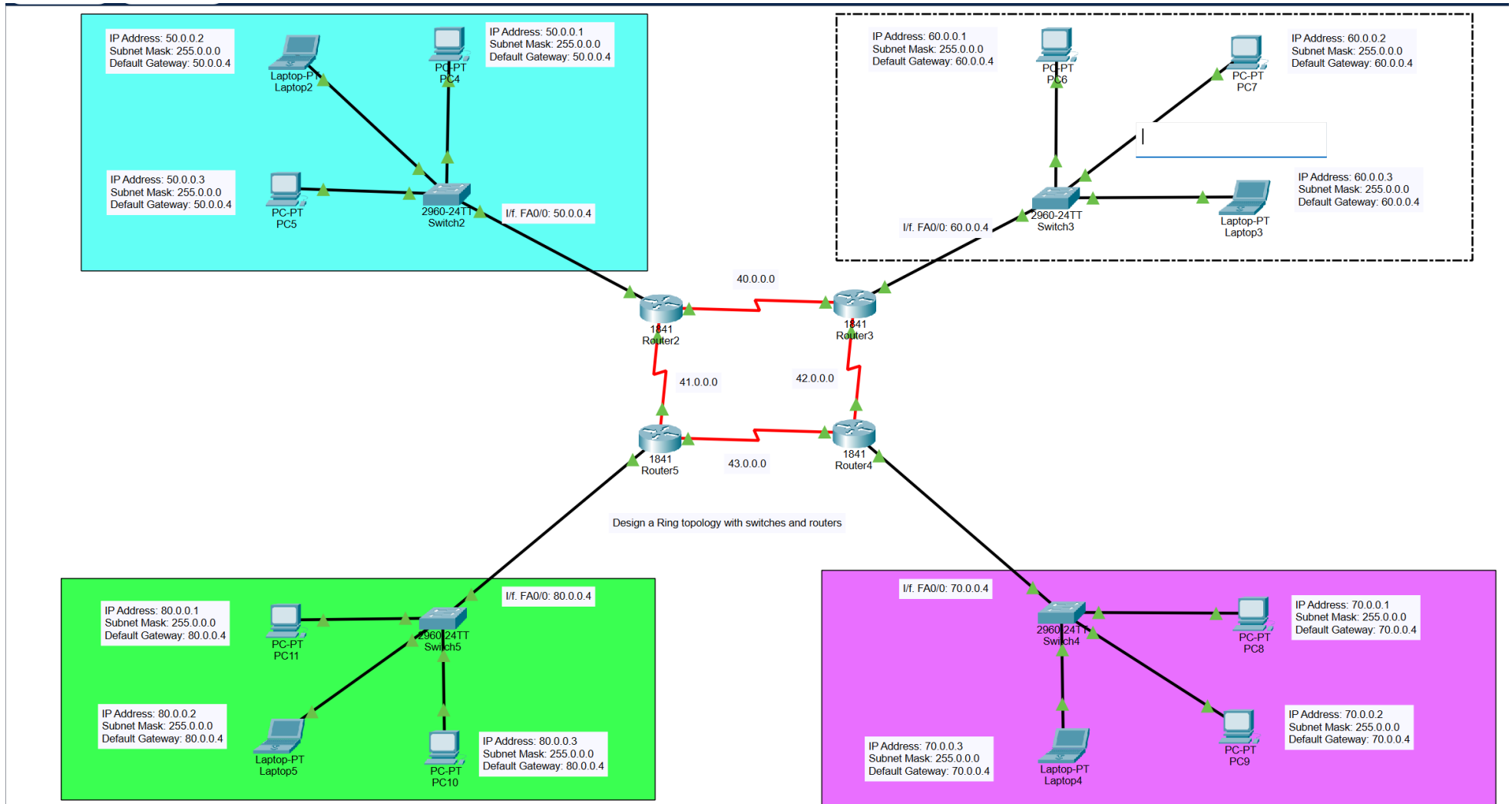
Design and configure a fully connected Ring Network in CISCO Packet Tracer and ensure all devices can communicate with each other.

Requirements:

1. Detailed Network Design(Screenshot from CISCO)
2. Basic setup
  1. What devices are added to the workspace in CISCO Packet Tracer?
  2. What are the steps to connect each device to every other device using appropriate cables?
3. MAC and IP address configuration
  1. How do you assign an IP address to each device in Ring Network? Mention the both IP and MAC address of each device from your network.
  2. Mention the configuration made on routers with different interfaces.
  3. What subnet mask should be used for the given IP address?
4. Verification
  1. How can you verify the connectivity between devices using the command?
  2. What steps would you take if a device does not respond to a ping request?
5. Status of packet transmission (screenshot of workspace along with status panel)

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## 1. Detailed Network Design(Screenshot from CISCO)



## 2. Basic setup

### a. What devices are added to the workspace in CISCO Packet Tracer?

- The devices used are:
  - 4 Switches
  - 4 Routers
  - 8 PCs
  - 4 Laptops

### b. What are the steps to connect each device to every other device using appropriate cables?

- Connect each Router to a Switch using a Copper Straight-through cable.
- Connect each Switch to 2 PCs and 1 Laptop using Copper Straight-through cables.
- Connect the Routers to each other using Serial cables to establish communication between them.

## 3. MAC and IP address configuration

### a. How do you assign an IP address to each device in the Bus Network?

**Mention both the IP and MAC addresses of each device from your network.**

- PCs and Laptops:
  - Click on a PC or Laptop.
  - Go to the "Desktop" tab.
  - Open the "IP Configuration" tool.
  - Assign an IP address and subnet mask.
    - PC4: IP Address: 50.0.0.1, MAC Address: 00E0.A39D.5A02
    - PC5: IP Address: 50.0.0.3, MAC Address: 0001.4377.8078
    - PC6: IP Address: 60.0.0.1, MAC Address: 0001.C781.6EE0
    - PC7: IP Address: 60.0.0.2, MAC Address: 00E0.8F85.C947
    - PC8: IP Address: 70.0.0.1, MAC Address: 0030.A38C.B6DB
    - PC9: IP Address: 70.0.0.2, MAC Address: 0060.70B6.6B69
    - PC10: IP Address: 80.0.0.3, MAC Address: 0060.2F35.5799
    - PC11: IP Address: 80.0.0.1, MAC Address: 00E0.F980.92B0
    - Laptop2: IP Address: 50.0.0.2, MAC Address: 0090.2BD0.835A
    - Laptop3: IP Address: 60.0.0.3, MAC Address: 000D.BD17.E4C3
    - Laptop4: IP Address: 70.0.0.3, MAC Address: 0002.17CD.E9DB
    - Laptop5: IP Address: 80.0.0.2, MAC Address: 0060.700A.4C37

- Routers:
  - Router2:
    - I/f. FA0/0: IP Address: 50.0.0.4, MAC Address: 00D0.D375.B702
    - I/f. Se0/0/0: IP Address: 40.0.0.1
    - I/f. Se0/0/1: IP Address: 41.0.0.2
    - RIP: 40.0.0.0, 41.0.0.0, 50.0.0.0
  - Router3:
    - I/f. FA0/0: IP Address: 60.0.0.4, MAC Address: 0001.63D7.5D85
    - I/f. Se0/0/0: IP Address: 40.0.0.2
    - I/f. Se0/0/1: IP Address: 42.0.0.1
    - RIP: 40.0.0.0, 42.0.0.0, 60.0.0.0
  - Router4:
    - I/f. FA0/0: IP Address: 70.0.0.4, MAC Address: 0005.5E29.E9AA
    - I/f. Se0/0/0: IP Address: 43.0.0.1
    - I/f. Se0/0/1: IP Address: 42.0.0.2
    - RIP: 42.0.0.0, 43.0.0.0, 70.0.0.0
  - Router5:
    - I/f. FA0/0: IP Address: 80.0.0.4, MAC Address: 0009.7C97.DAE8
    - I/f. Se0/0/0: IP Address: 43.0.0.2
    - I/f. Se0/0/1: IP Address: 41.0.0.1
    - RIP: 41.0.0.0, 43.0.0.0, 80.0.0.0

**b. Mention the configuration made on routers with different interfaces.**

- Added HWIC-2T Module
- Set Respective FA0/0 and FA0/1 (We do not assign any values to FA0/1 in this problem)
- Set Respective Se0/0/0 and Se0/0/1
- Set all the RIP Routing.

**c. What subnet mask should be used for the given IP address?**

Devices		Subnet - Mask
PC	PC4	255.0.0.0
	PC5	
	PC6	
	PC7	
	PC8	
	PC9	
	PC10	
	PC11	

Devices		Subnet - Mask
Laptop	Laptop2	255.0.0.0
	Laptop3	
	Laptop4	
	Laptop5	

#### 4. Verification

a. How can you verify the connectivity between devices using the command?

- Open the Command Prompt on a PC or Laptop.
- Use the ping command to test connectivity. For example:

Unset

```
ping ip-address-of-the-target
```

- Some Examples:
  - Pinging 50.0.0.2 to 60.0.0.3

```
C:\>ping 60.0.0.3

Pinging 60.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 60.0.0.3: bytes=32 time=10ms TTL=126
Reply from 60.0.0.3: bytes=32 time=10ms TTL=126
Reply from 60.0.0.3: bytes=32 time=10ms TTL=126

Ping statistics for 60.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 10ms, Average = 10ms
```

- Pinging 60.0.0.1 to 70.0.0.2

```
C:\>ping 70.0.0.2

Pinging 70.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 70.0.0.2: bytes=32 time=12ms TTL=125
Reply from 70.0.0.2: bytes=32 time=12ms TTL=125
Reply from 70.0.0.2: bytes=32 time=12ms TTL=125

Ping statistics for 70.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 12ms, Average = 12ms
```

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- Pinging 70.0.0.3 to 80.0.0.1

```
C:\>ping 80.0.0.1

Pinging 80.0.0.1 with 32 bytes of data:

Request timed out.
Reply from 80.0.0.1: bytes=32 time=10ms TTL=126
Reply from 80.0.0.1: bytes=32 time=10ms TTL=126
Reply from 80.0.0.1: bytes=32 time=10ms TTL=126

Ping statistics for 80.0.0.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 10ms, Average = 10ms
```

- Pinging 80.0.0.3 to 50.0.0.1

```
C:\>ping 50.0.0.1

Pinging 50.0.0.1 with 32 bytes of data:

Reply from 50.0.0.1: bytes=32 time=8ms TTL=128
Reply from 50.0.0.1: bytes=32 time=4ms TTL=128
Reply from 50.0.0.1: bytes=32 time=4ms TTL=128
Reply from 50.0.0.1: bytes=32 time=4ms TTL=128

Ping statistics for 50.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 8ms, Average = 5ms
```

**b. What steps would you take if a device does not respond to a ping request?**

- Check cabling and ensure correct IP addressing.
- Verify that the routers are properly configured and that routing between networks is enabled.
- Ensure that all interfaces are up and running.

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## 5. Status of packet transmission (screenshot of workspace along with status panel)

Cisco Packet Tracer - E:\bus, ring, hybrid.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x: 3331, y: 840

Design a Ring topology with switches and routers

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.000	--
	0.001	PC7
	0.002	Switch3
	0.003	Router3
	0.004	Router4
	0.005	Switch4
	0.006	PC9
	0.007	Switch4
	0.008	Router4
	0.009	Router3
	0.010	Switch3
	0.521	--
Visible	0.522	Switch2
Visible	0.522	Switch2
Visible	0.522	Switch2
Visible	0.522	Switch2

Reset Simulation Constant Delay Captured to: 0.522 s

Play Controls

Event List Filters - Visible Events

ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:08:57.838 PLAY CONTROLS

Router-PT-Empty

Scenario 0

New Delete

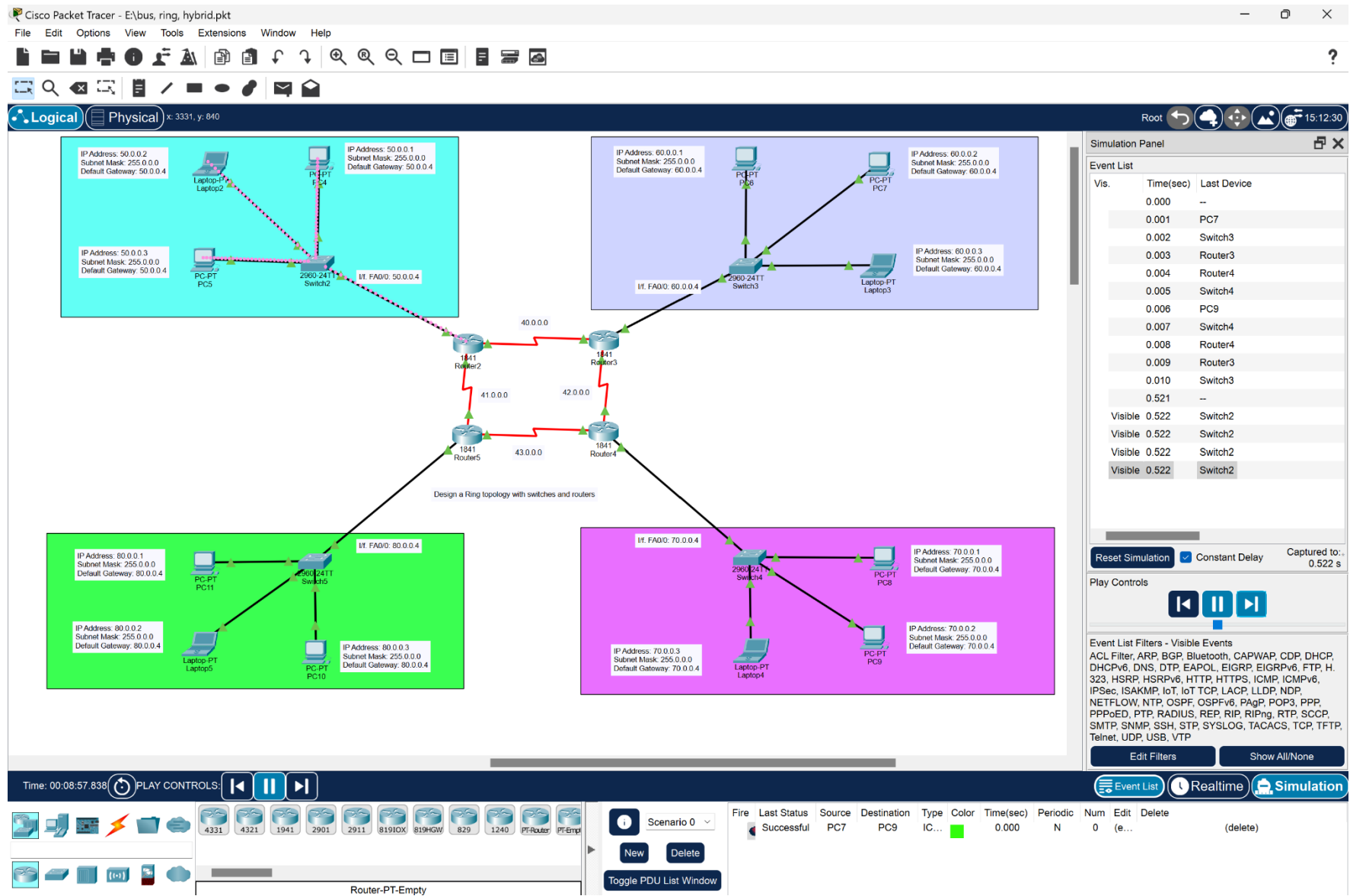
Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC7	PC9	IC...		0.000	N	0	(e...)	(delete)

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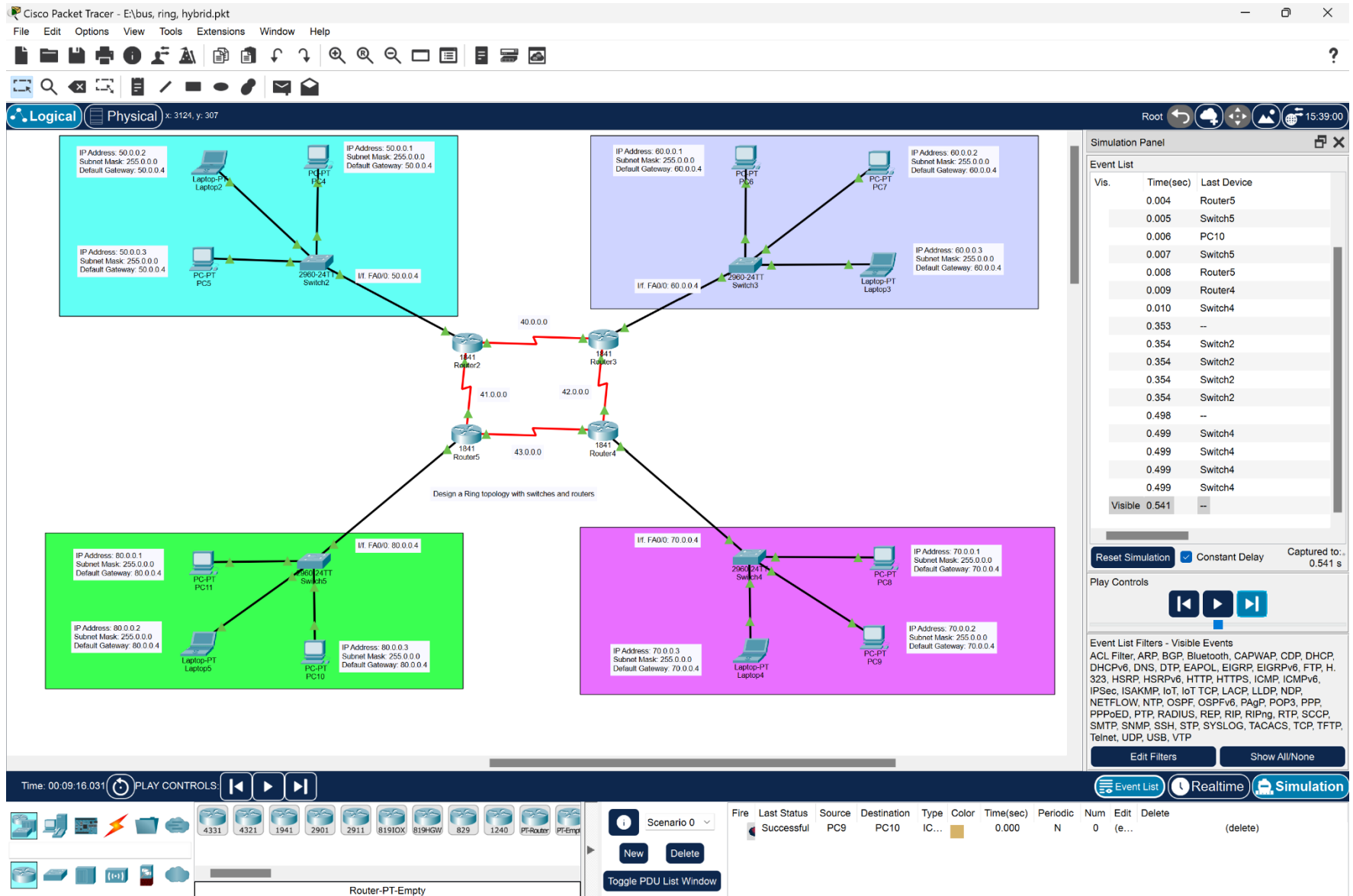
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### 1. Sending Message from PC7 to PC9





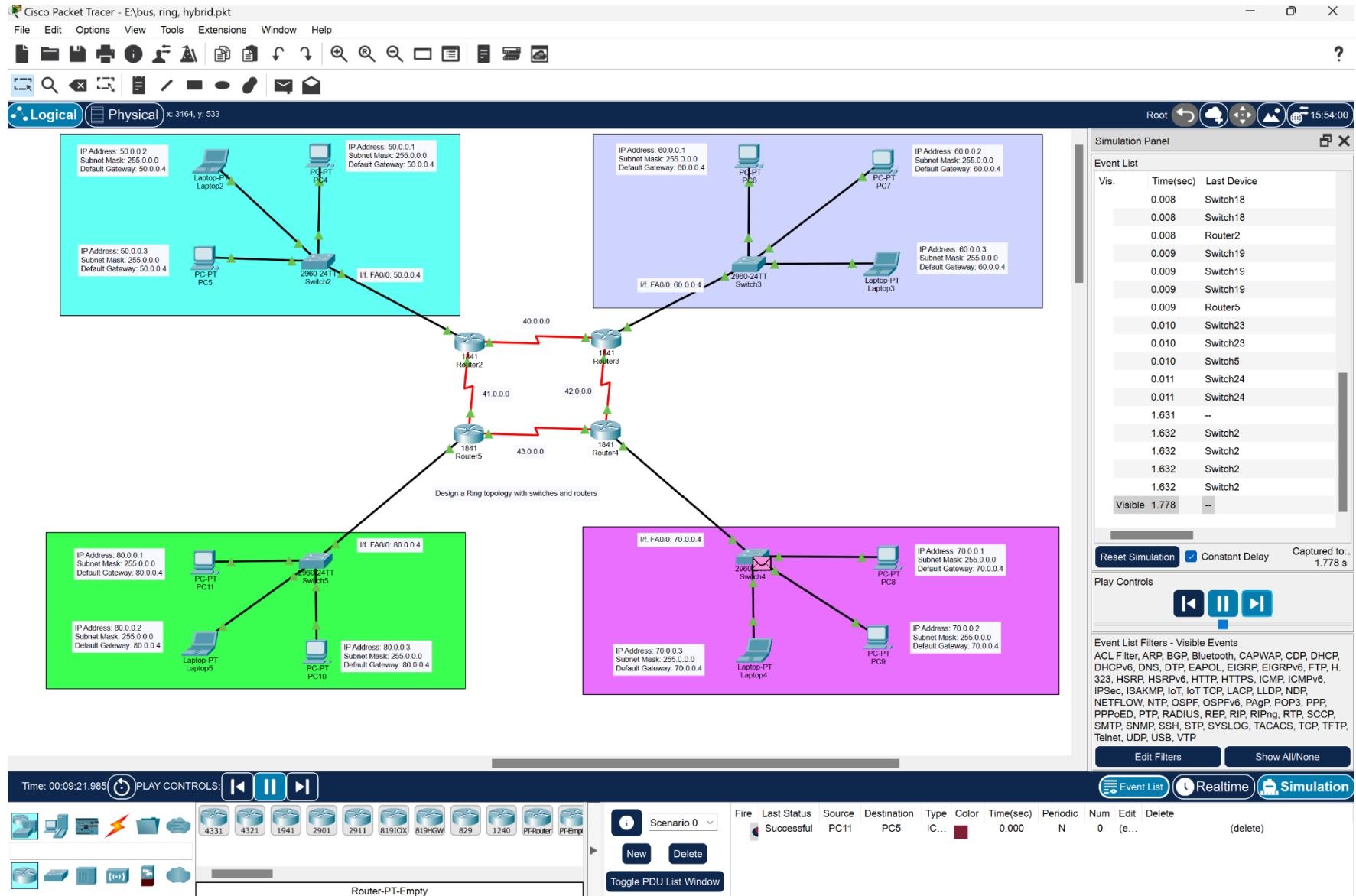
## 2. Sending Message from PC9 to PC10



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### 3. Sending Message from PC11 to PC5



#### 4. Sending Message from PC4 to PC6

