

## Worksheet – 3.3

**Student Name:** Vivek Kumar

**UID:** 21BCS8129

**Branch:** BE-CSE (LEET)

**Section/Group:** 809/A

**Semester:** 4th

**Date of Performance:** 12/05/2022

**Subject Name:** Computer Network Lab

**Subject Code:** 20CSP-257

### 1. Aim/Overview of the practical:

Create a network to implement TCP/IP protocol.

### 2. Task to be done/ Which logistics used:

Create a network to implement TCP/IP protocol.

### 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:

**TCP/IP** stands for Transmission Control Protocol/Internet Protocol and is a suite of communication protocols used to interconnect network devices on the internet. TCP/IP is also used as a communications protocol in a private computer network (an intranet or extranet).

The entire IP suite -- a set of rules and procedures -- is commonly referred to as TCP/IP. TCP and IP are the two main protocols, though others are included in the suite. The TCP/IP protocol suite functions as an abstraction layer between internet applications and the routing and switching fabric.

**Common TCP/IP protocols include the following:**

- **Hypertext Transfer Protocol (HTTP)** handles the communication between a web server and a web browser.

- **HTTP Secure** handles secure communication between a web server and a web browser.
- **File Transfer Protocol** handles transmission of files between computers.

### **Pros and cons of TCP/IP:**

The advantages of using the TCP/IP model include the following:

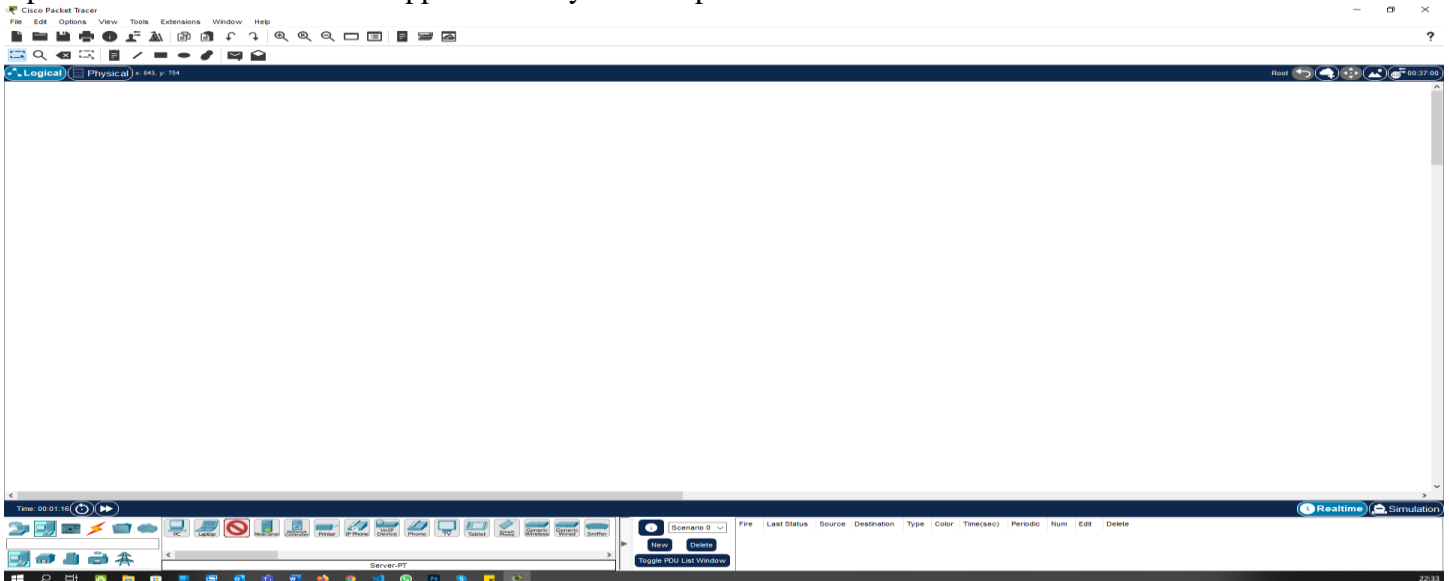
- helps establish a connection between different types of computers;
- works independently of the OS;
- supports many routing protocols;
- uses client-server architecture that is highly scalable;
- can be operated independently;
- supports several routing protocols; and
- is lightweight and doesn't place unnecessary strain on a network or computer.

The disadvantages of TCP/IP include the following:

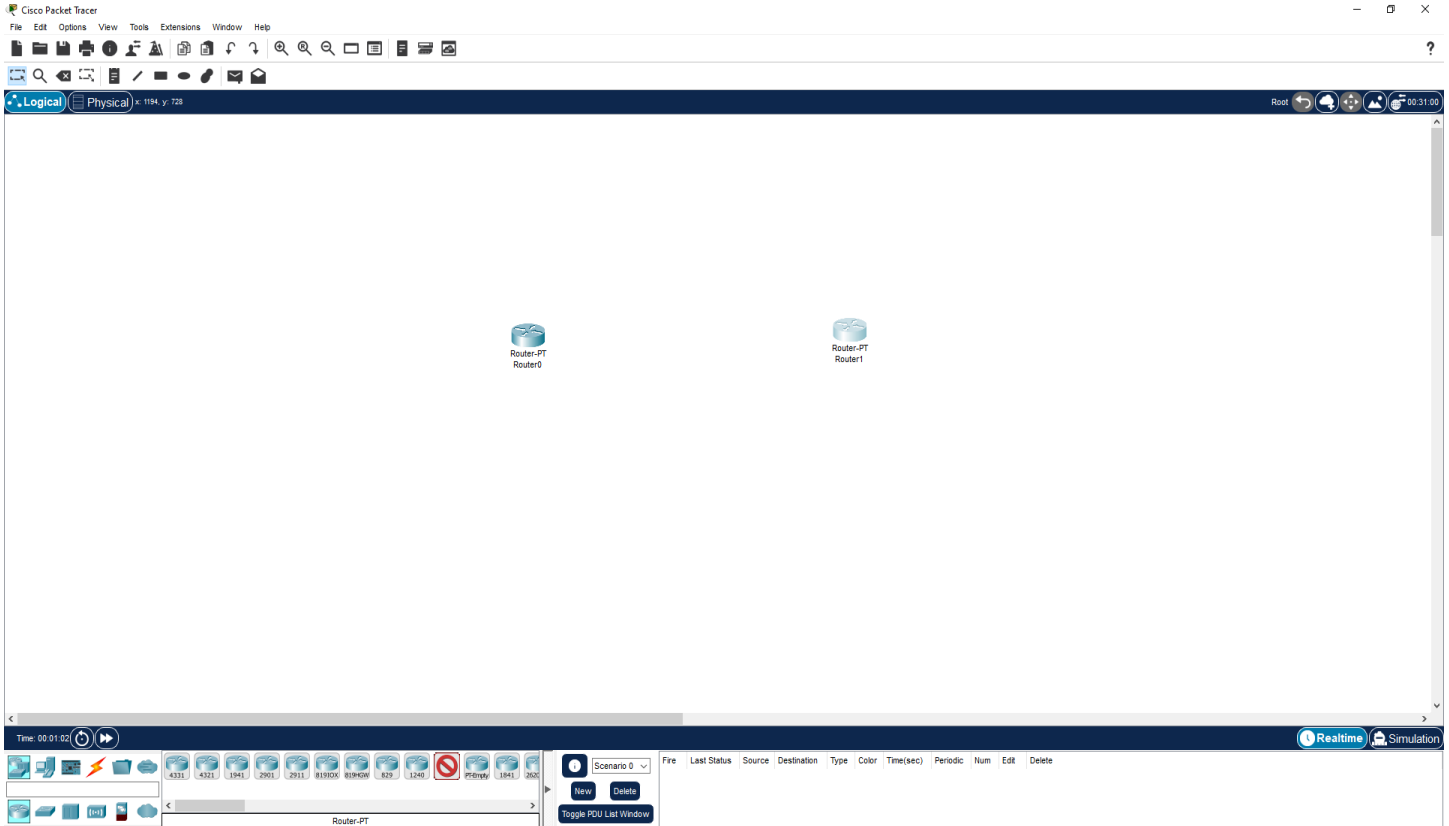
- is complicated to set up and manage;
- transport layer does not guarantee delivery of packets;
- is not easy to replace protocols in TCP/IP;
- does not clearly separate the concepts of services, interfaces and protocols, so it is not suitable for describing new technologies in new networks; and
- is especially vulnerable to a synchronization attack, which is a type of denial-of-service attack in which a bad actor uses TCP/IP.

### **Procedure:**

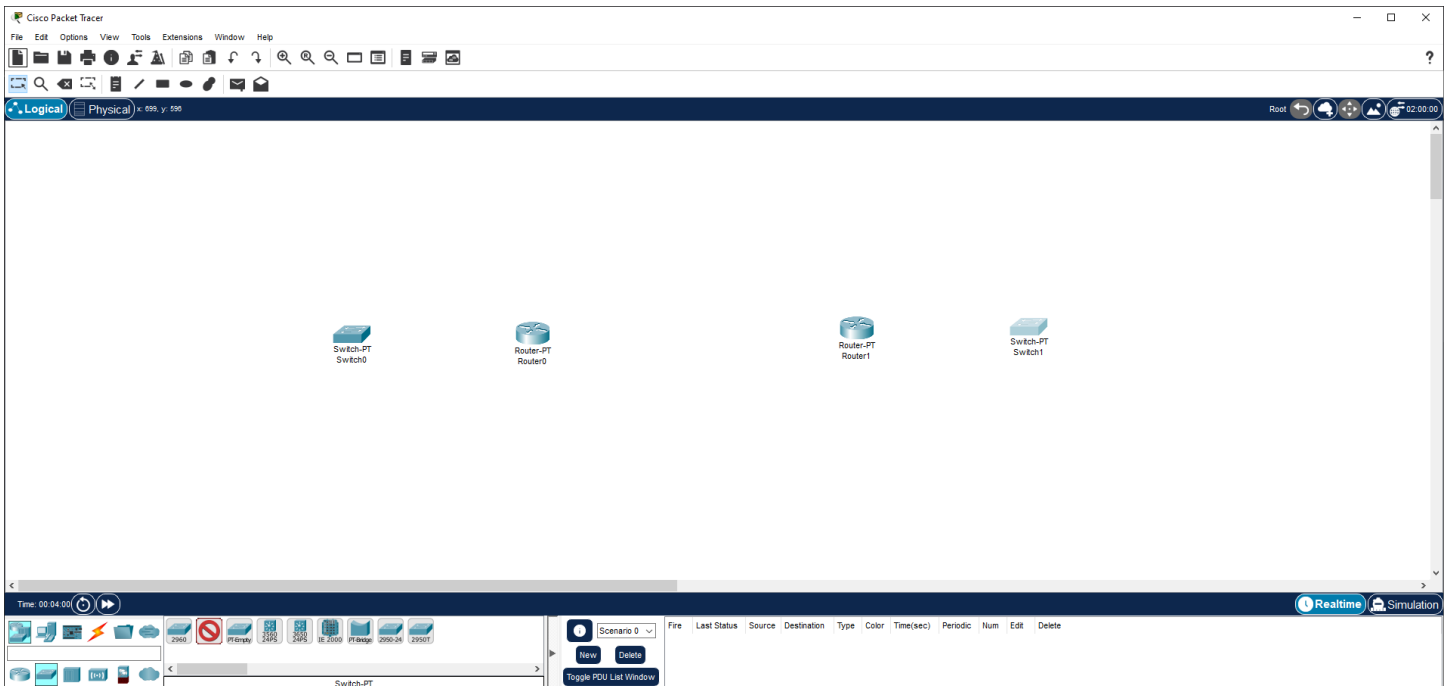
Open the Cisco Packet Tracer Application in your Computer



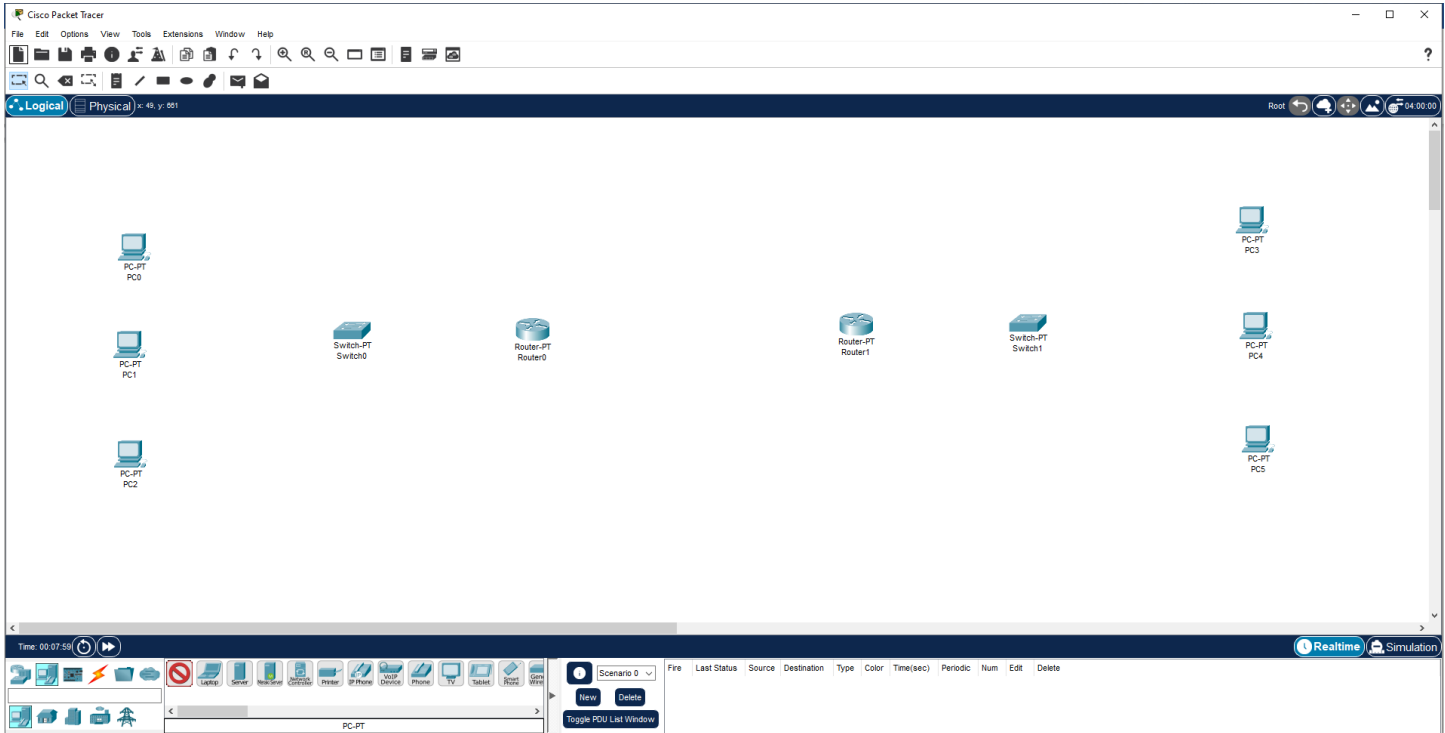
Go to the Bottom Bar “Network Devices -> Routers” and create the two Router:



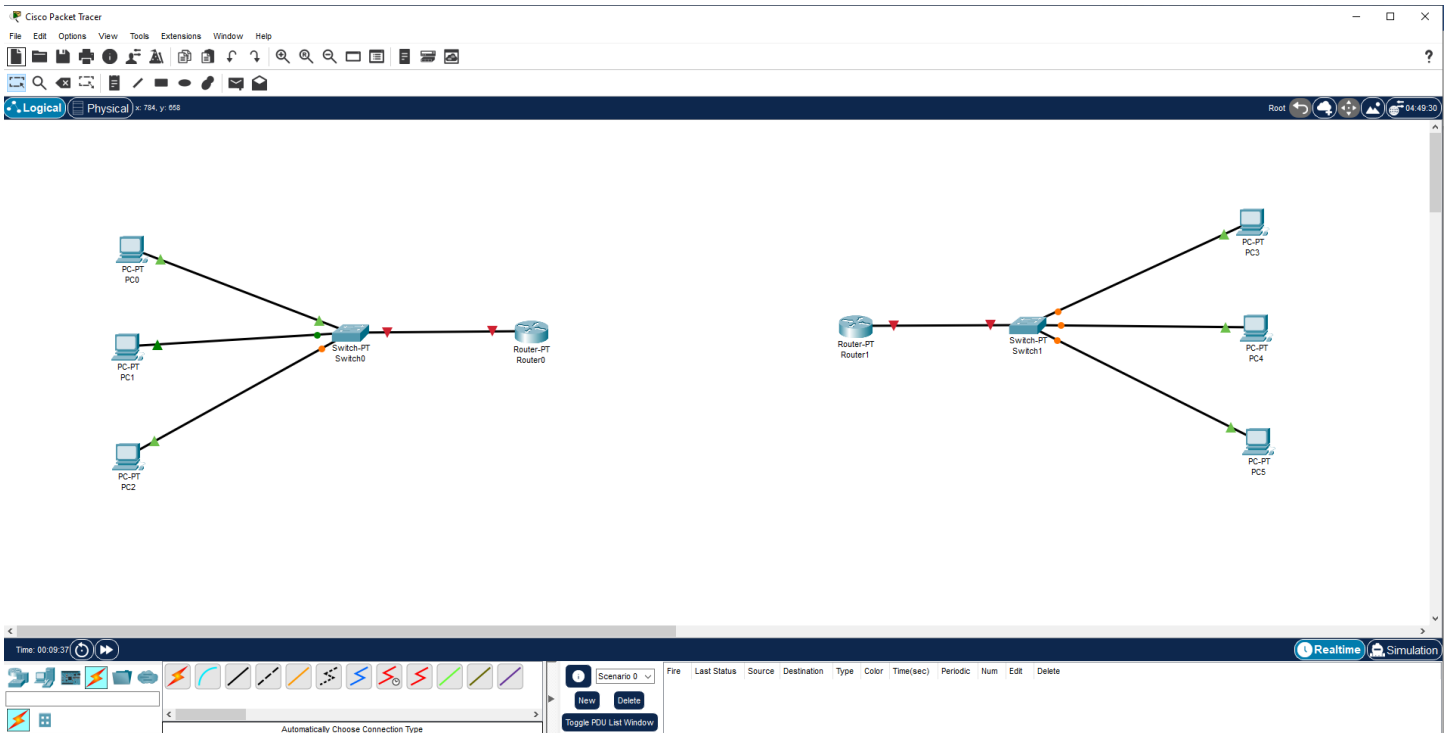
Go to the Bottom Bar “Network Devices -> Switchers” and create the two switches:



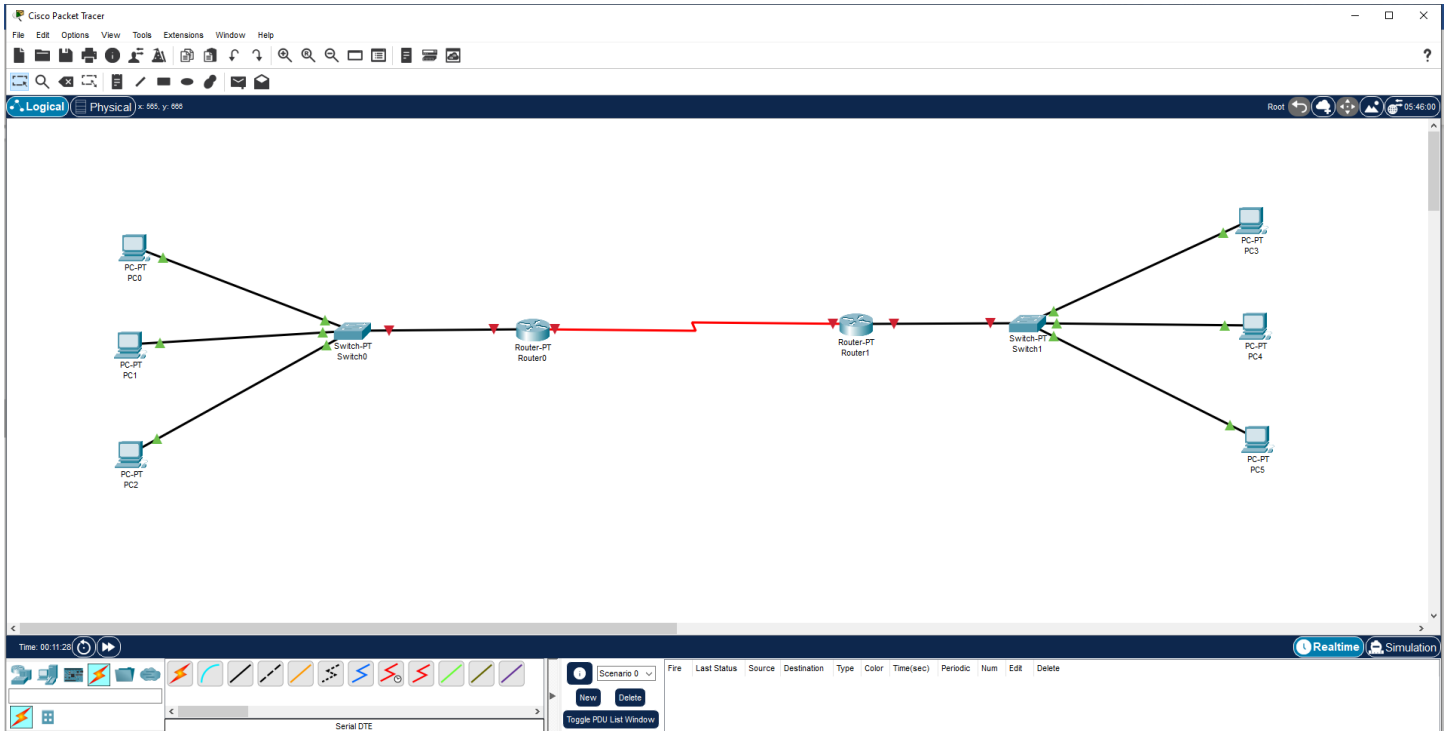
Go to the Bottom Bar “End Devices -> PC” and create the 3-3 PCs for each Switches:



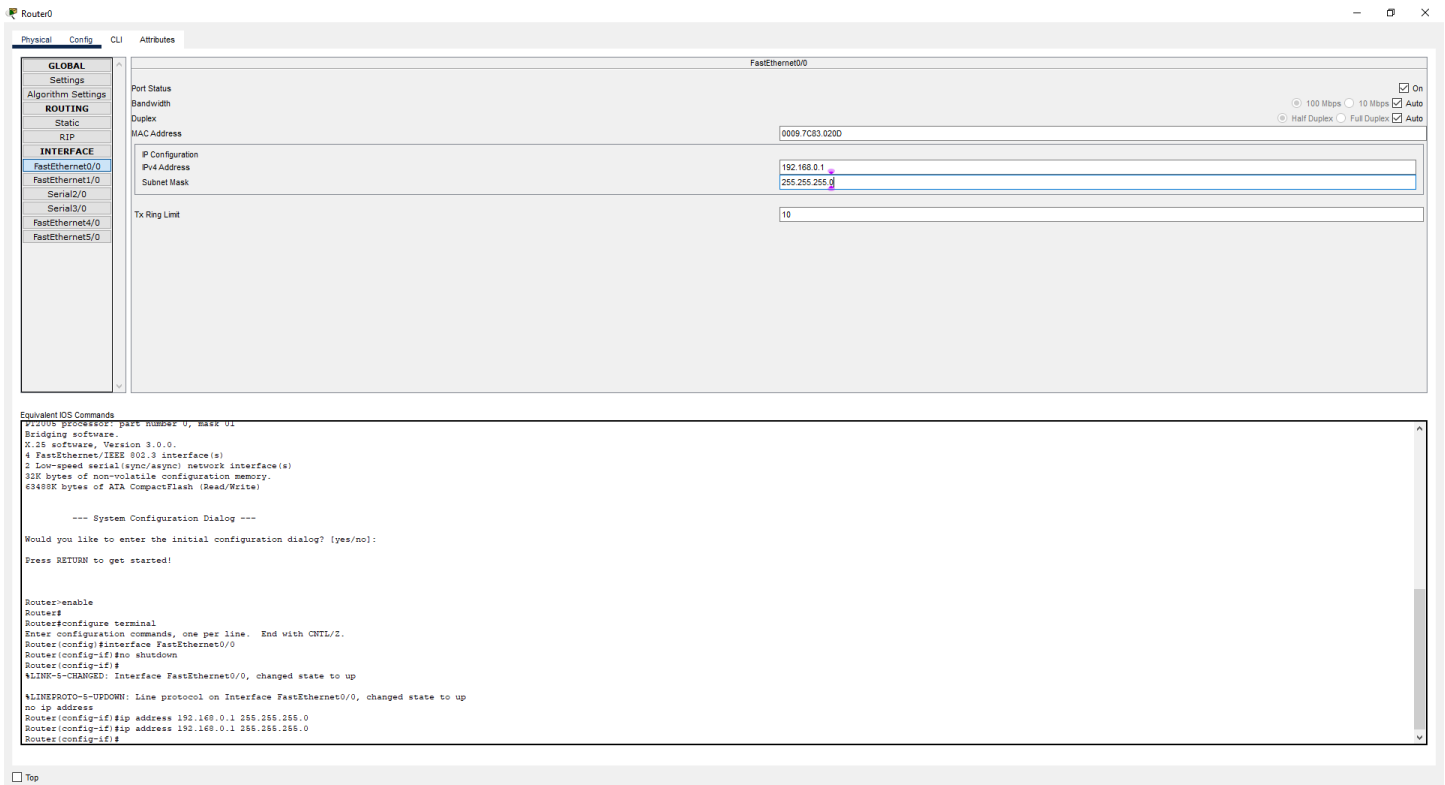
In Bottom Bar “Connections -> Copper Straight-Through” and create the connections between all the Devices:



In Bottom Bar “Connections -> Serial DTE cable” and create the connections between both routers through serial port:



Open Router 0 configuration and in Fast ethernet 0/0 turn it on and assign the IP-Address:



The image shows the configuration window for Router0. The 'Config' tab is active, and the 'INTERFACE' section is expanded, showing 'FastEthernet0/0'. The configuration for this interface is as follows:

- Port Status: On
- Bandwidth: 100 Mbps
- Duplex: Auto
- MAC Address: 0009 7C83 0290
- IP Configuration:
  - Pv4 Address: 192.168.0.1
  - Subnet Mask: 255.255.255.0
- Tx Ring Limit: 10

Below the configuration window, the 'Equivalent IOS Commands' are listed:

```

configure router
  interface FastEthernet0/0
    no shutdown
    ip address 192.168.0.1 255.255.255.0
  
```

The CLI window shows the following commands and output:

```

Router>enable
Router#
Router>configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINE-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#
  
```

Open PC configuration and in Desktop and assign the IP-Address for all left PC, with default gateway which we assign to router 0:

PC0

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::2E0:F7FF:FEA5:520A

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MDS

Username

Password

Top

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::201:63FF:FE31:944B

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MDS

Username

Password

Top

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.0.4

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::290:2BFF:FE30:1C28

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Now Open Router 1 configuration and in Fast ethernet 0/0 turn it on and assign the IP-Address:

Router1

Physical Config CLI Attributes

FastEthernet0/0

Port Status: ☒ On

Bandwidth: 100 Mbps 10 Mbps ☒ Auto

Duplex: ☒ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address: 0060.2FB1.28B5

IP Configuration

IPv4 Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Tx Ring Limit: 10

Equivalent IOS Commands

```
Router#enable
Router#
Router#configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
ip address 192.168.1.1 255.255.255.0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#
```

☐ Top

Open PC configuration and in Desktop and assign the IP-Address for all right PC, with default gateway which we assign to router 1:

PC3
Physical Config Desktop Programming Attributes

IP Configuration
Interface FastEthernet0

IP Configuration
☐ DHCP
☒ Static

IPv4 Address 192.168.1.2
Subnet Mask 255.255.255.0
Default Gateway 192.168.1.1
DNS Server 0.0.0.0

IPv6 Configuration
☐ Automatic
☒ Static

IPv6 Address
Link Local Address FE80::260:47FF:FEDA:185A
Default Gateway
DNS Server

802.1X
☐ Use 802.1X Security

Authentication MDS
Username
Password

Top

PC4
Physical Config Desktop Programming Attributes

IP Configuration
Interface FastEthernet0

IP Configuration
☐ DHCP
☒ Static

IPv4 Address 192.168.1.3
Subnet Mask 255.255.255.0
Default Gateway 192.168.1.1
DNS Server 0.0.0.0

IPv6 Configuration
☐ Automatic
☒ Static

IPv6 Address
Link Local Address FE80::230:F2FF:FECB:CC4D
Default Gateway
DNS Server

802.1X
☐ Use 802.1X Security

Authentication MDS
Username
Password

Top



PCS

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.4

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:97FF:FE38:70B8

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Now Open the Router 0 configuration Serial Port, turn it on change the clock speed and assign the IP-Address:

192.168.0.1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

Serial2/0

Port Status: ☒ On

Duplex: ☒ Full Duplex

Clock Rate: 125000

IP Configuration

IPv4 Address: 172.0.0.1

Subnet Mask: 255.255.0.0

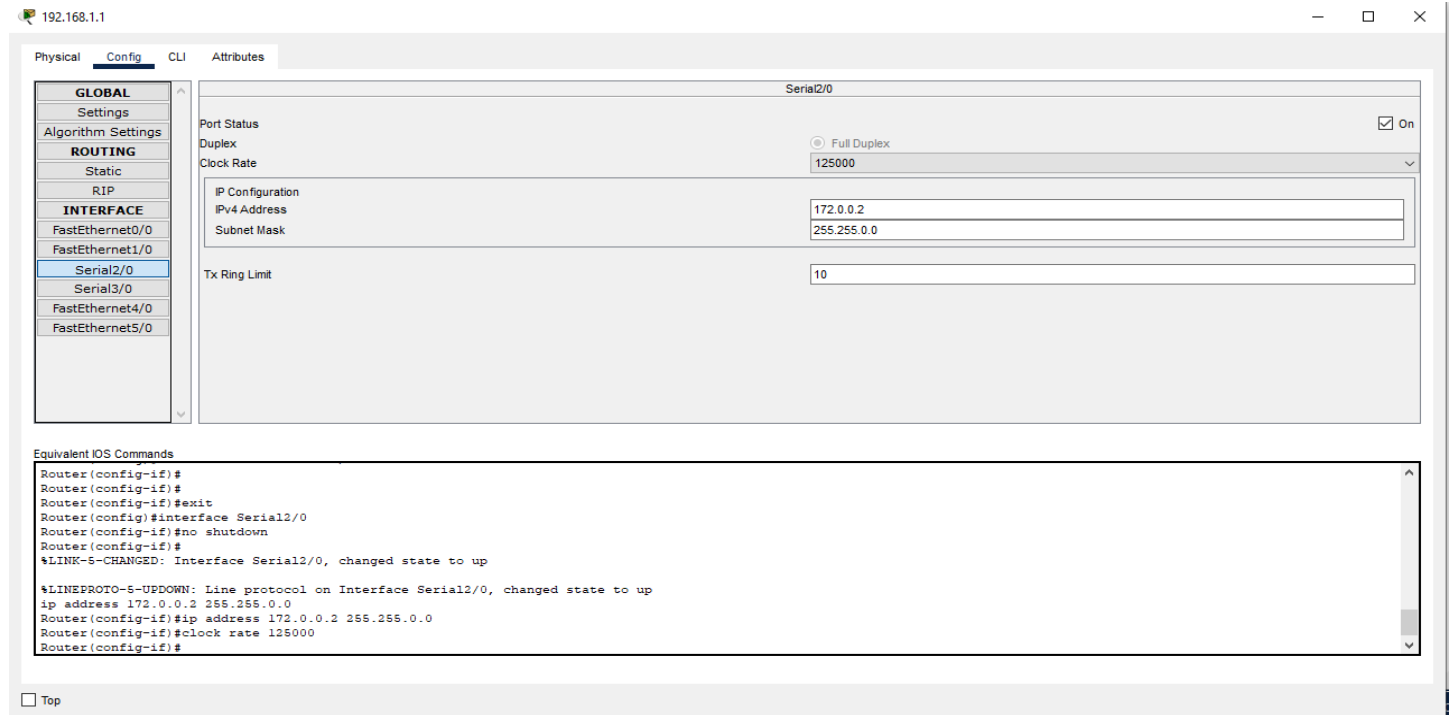
Tx Ring Limit: 10

Equivalent IOS Commands

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
Router(config-if)#clock rate 125000
This command applies only to DCE interfaces
Router(config-if)#ip address 172.0.0.1 255.255.0.0
Router(config-if)#ip address 172.0.0.1 255.255.0.0
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
```

☐ Top

Now Open the Router 1 configuration Serial Port, turn it on change the clock speed same as router 0 and assign the IP-Address:



192.168.1.1

Physical Config CLI Attributes

**GLOBAL**

Settings

Algorithm Settings

**ROUTING**

Static

RIP

**INTERFACE**

FastEthernet0/0

FastEthernet1/0

**Serial2/0**

Serial3/0

FastEthernet4/0

FastEthernet5/0

Serial2/0

Port Status ☒ On

Duplex ☒ Full Duplex

Clock Rate 125000

IP Configuration

IPv4 Address 172.0.0.2

Subnet Mask 255.255.0.0

Tx Ring Limit 10

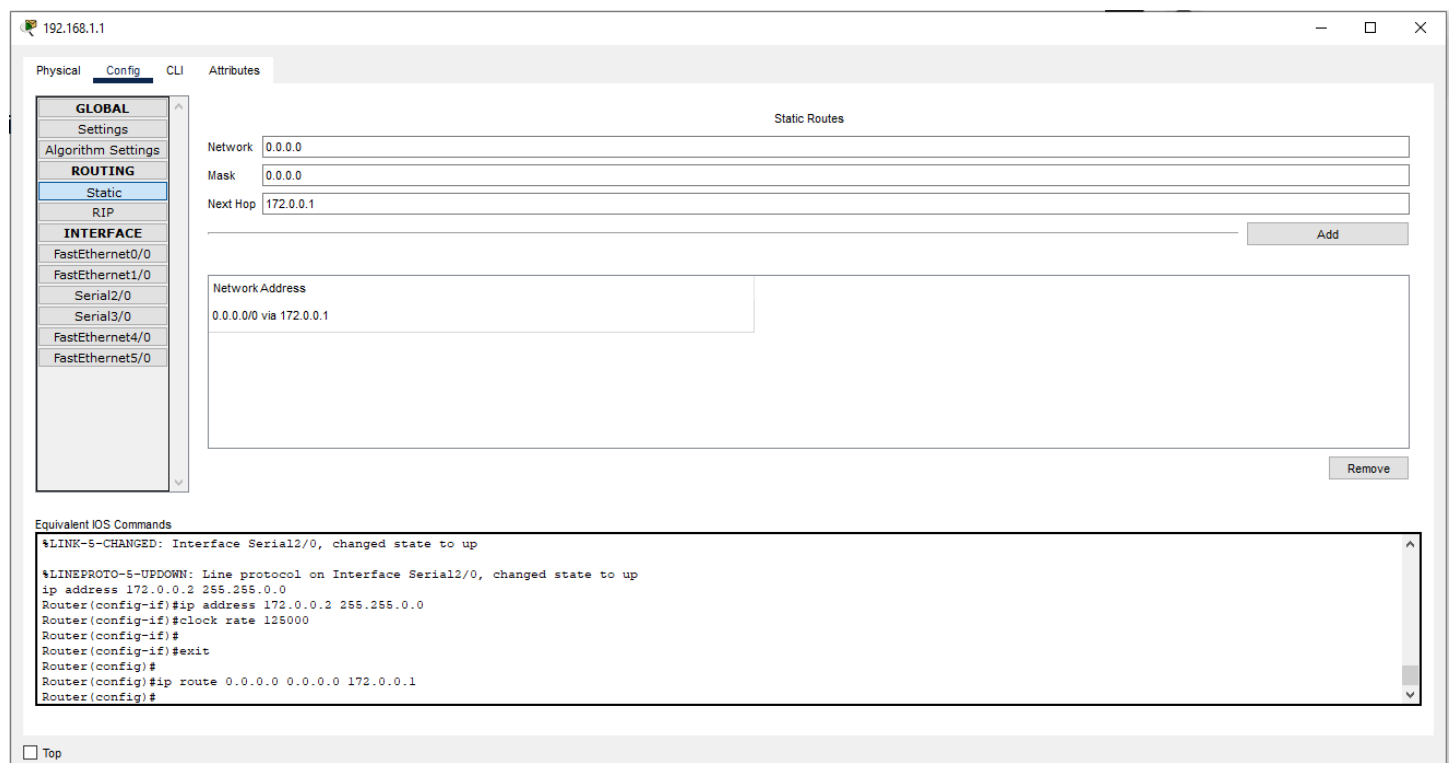
Equivalent IOS Commands

```
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
ip address 172.0.0.2 255.255.0.0
Router(config-if)#ip address 172.0.0.2 255.255.0.0
Router(config-if)#clock rate 125000
Router(config-if)#
```

☐ Top

Now open the Static routing and the add the next hope and keep all network address and Mask as 0.0.0.0 and add it.



192.168.1.1

Physical Config CLI Attributes

**GLOBAL**

Settings

Algorithm Settings

**ROUTING**

Static

RIP

**INTERFACE**

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

Static Routes

Network 0.0.0.0

Mask 0.0.0.0

Next Hop 172.0.0.1

Add

Network Address

0.0.0.0/0 via 172.0.0.1

Remove

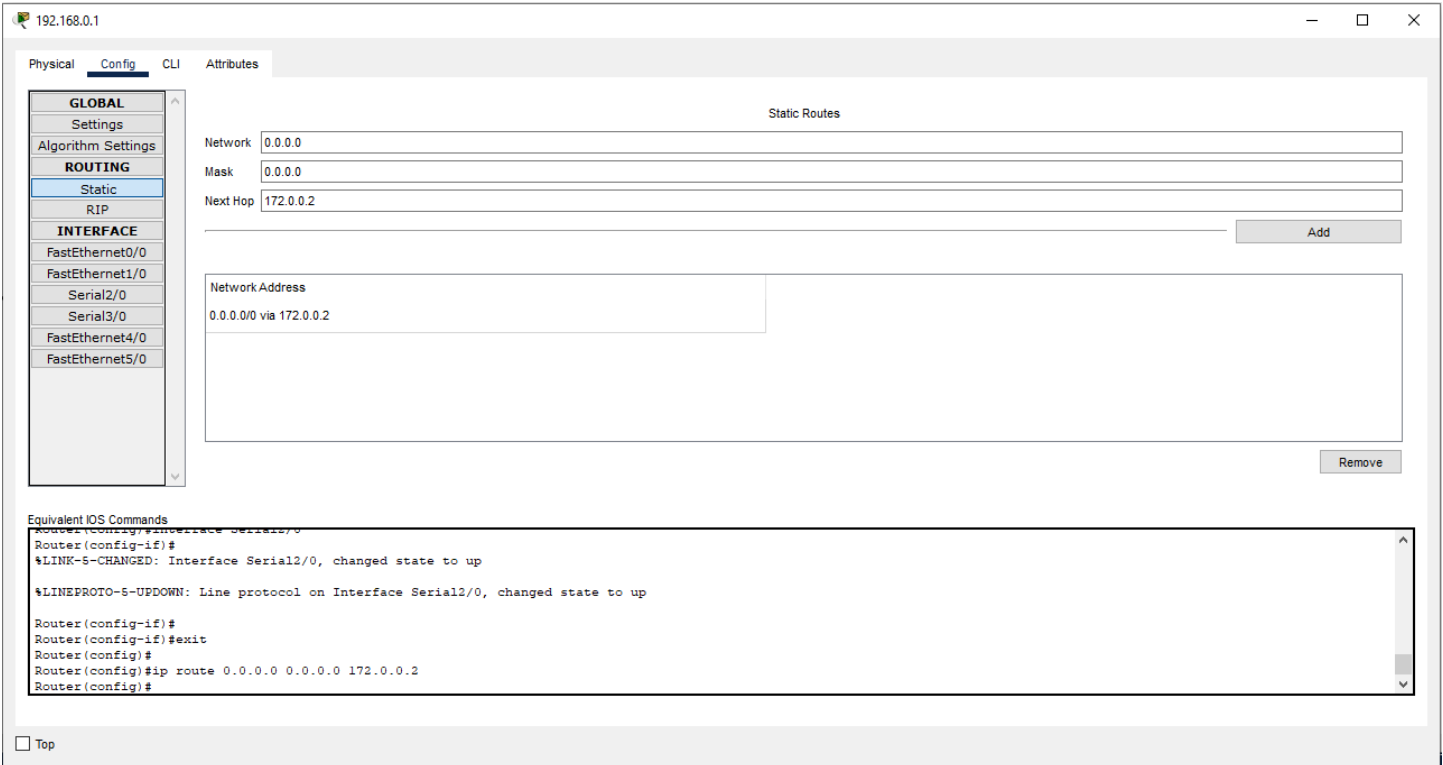
Equivalent IOS Commands

```
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
ip address 172.0.0.2 255.255.0.0
Router(config-if)#ip address 172.0.0.2 255.255.0.0
Router(config-if)#clock rate 125000
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 0.0.0.0 0.0.0.0 172.0.0.1
Router(config)#
```

☐ Top

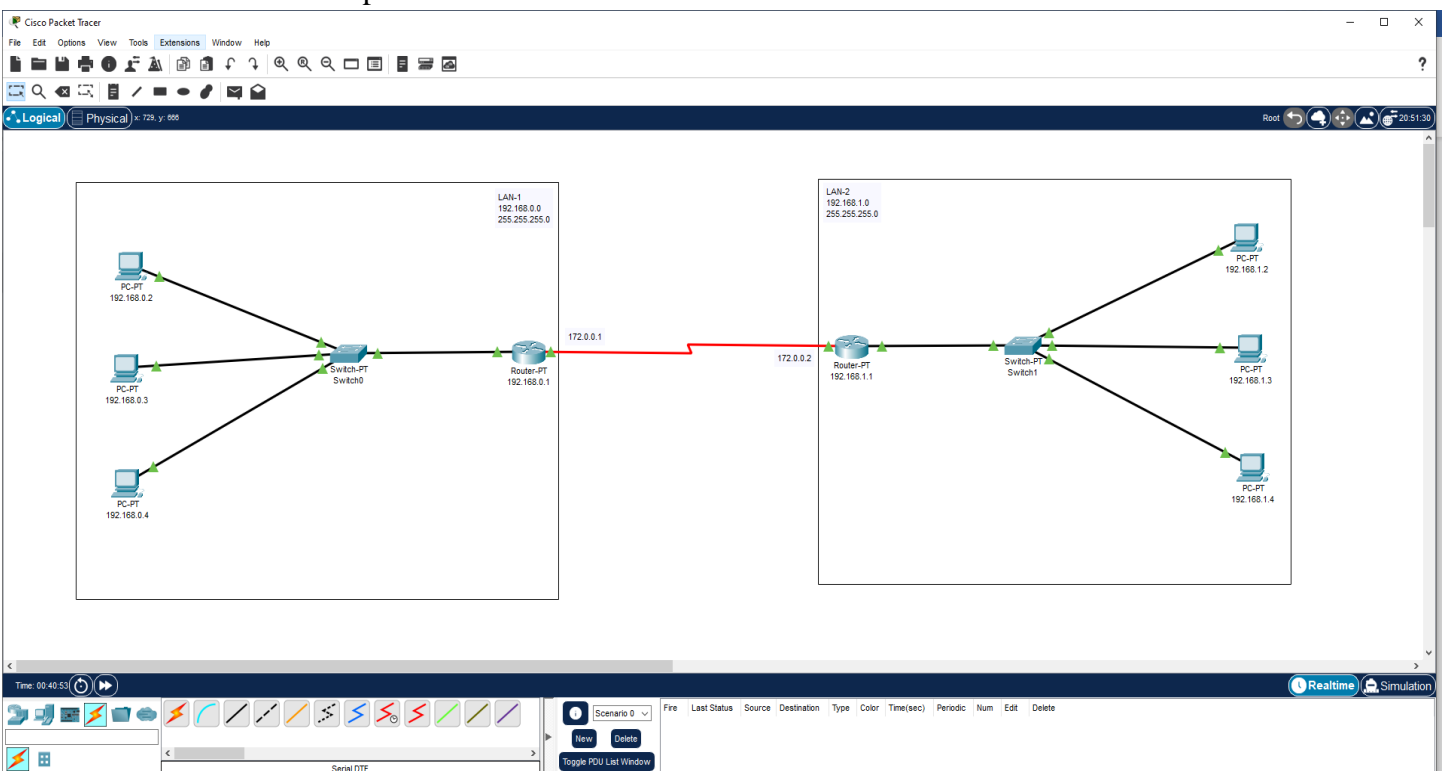
Now open Router 0 configuration -> Static routing and the add the next hope and keep all network address and Mask as 0.0.0.0 and add it.



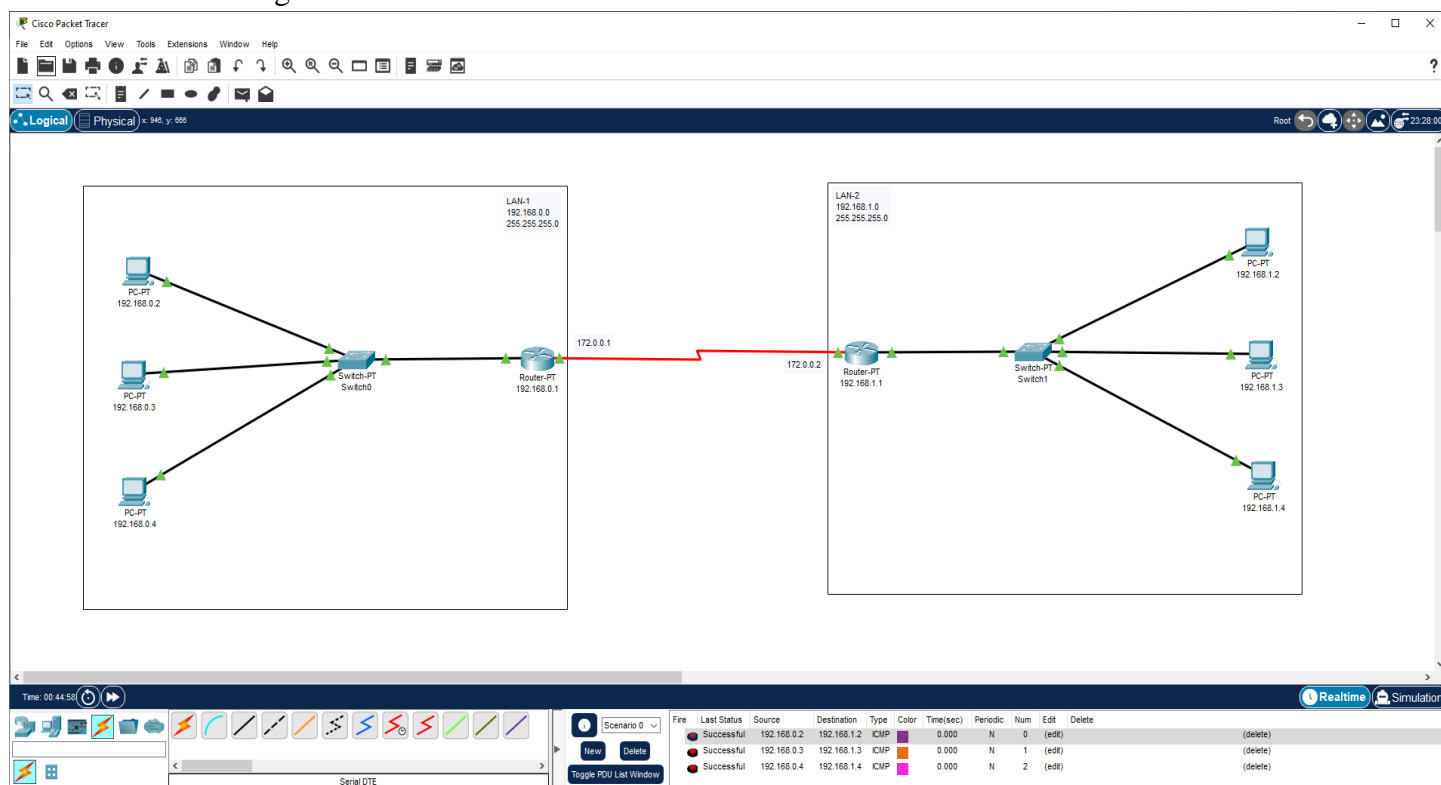
The screenshot shows the configuration window for Router 0 (192.168.0.1) in Cisco Packet Tracer. The 'Config' tab is active, and the 'Static Routes' section is expanded. The 'Network' field is set to 0.0.0.0, the 'Mask' is 0.0.0.0, and the 'Next Hop' is 172.0.0.2. The 'Add' button is visible. Below the configuration fields, the 'Equivalent IOS Commands' section shows the following commands:

```
Router(config)#interface Serial2/0
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 0.0.0.0 0.0.0.0 172.0.0.2
Router(config)#
```

Now our connection is Completed:



Now send the Message from device of Lan-1 to device of Lan-2 and observe the Simulation.



### Learning outcomes (What I have learnt):

1. Learnt how to create the TCP/IP Protocol connection.
2. Learnt how to configure TCP/IP Protocol success fully and send the message withing two different networks.

**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.			