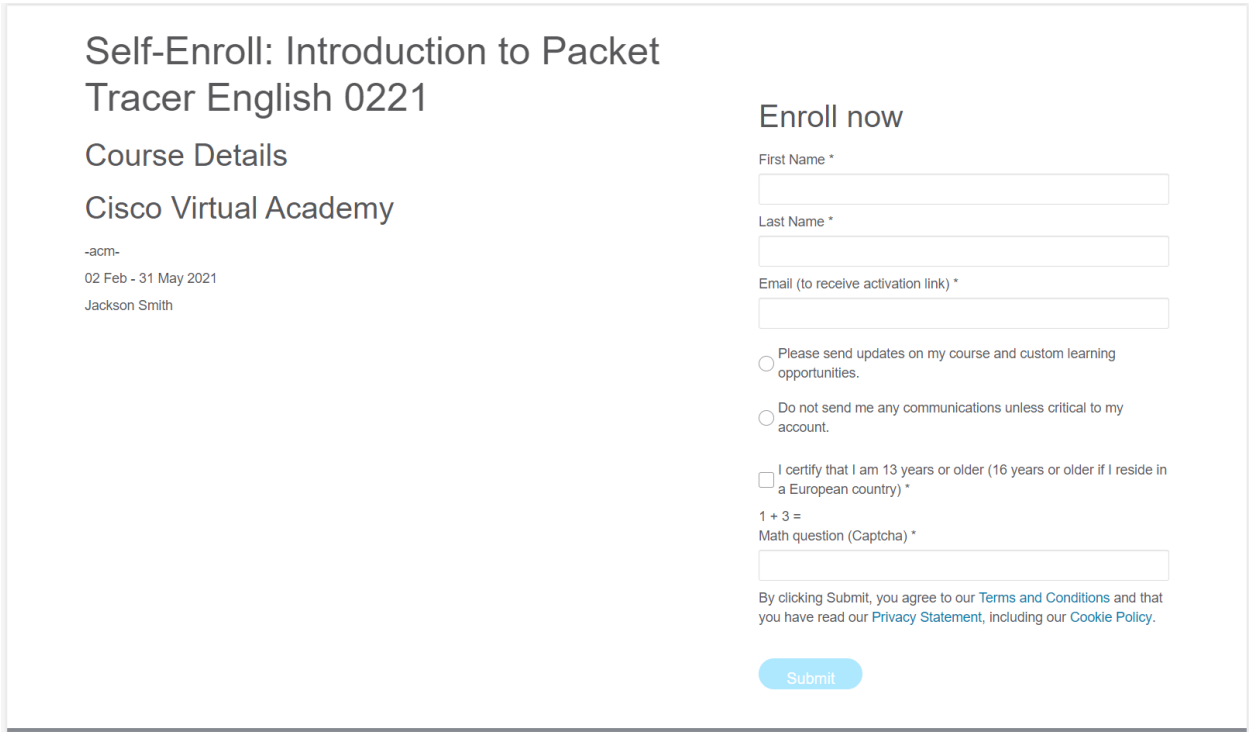
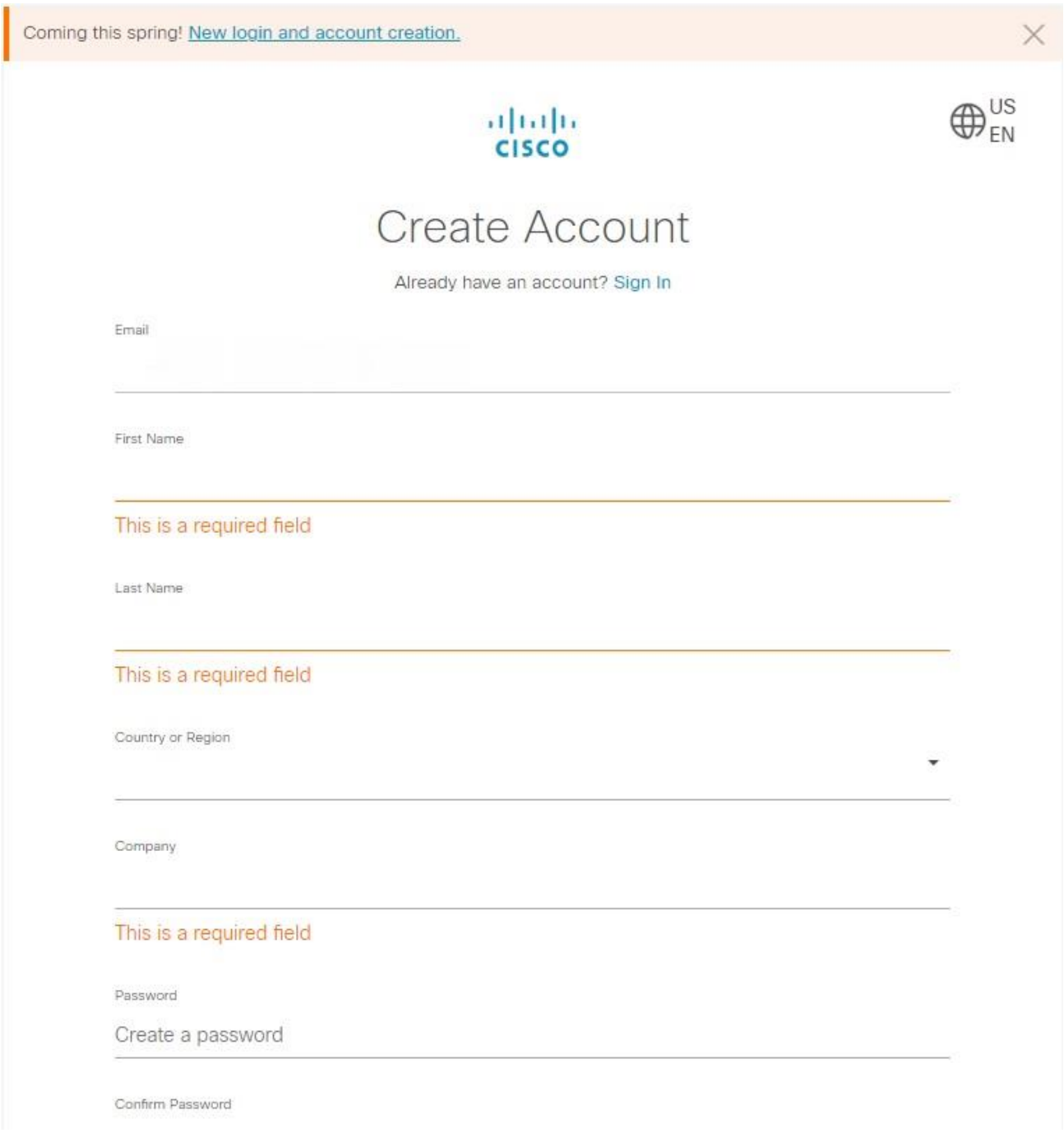
Cisco Packet Tracer Installation and setup

Step 1: Create a Cisco Account.

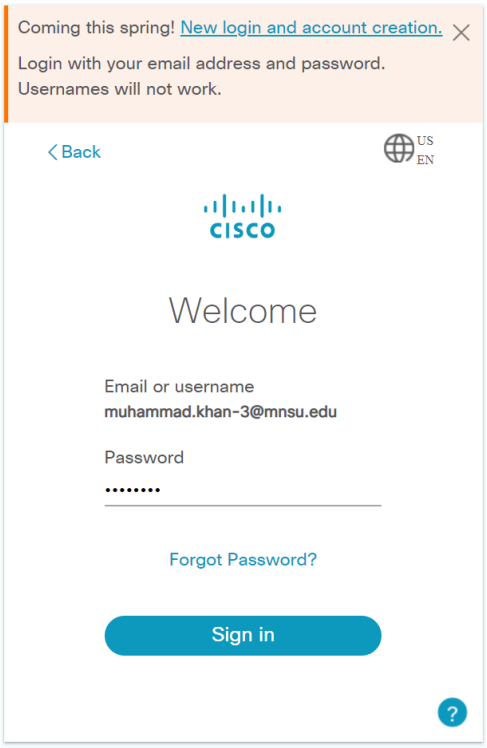
A. Go to https://www.netacad.com/portal/self-enroll/m/331867
B. Enter sign up information.
C. Create Account.




Coming this spring! New login and account creation.
US
EN
Create Account
Already have an account? Sign In
Email
First Name
This is a required field
Last Name
This is a required field
Country or Region
Company
This is a required field
Password
Create a password
Confirm Password

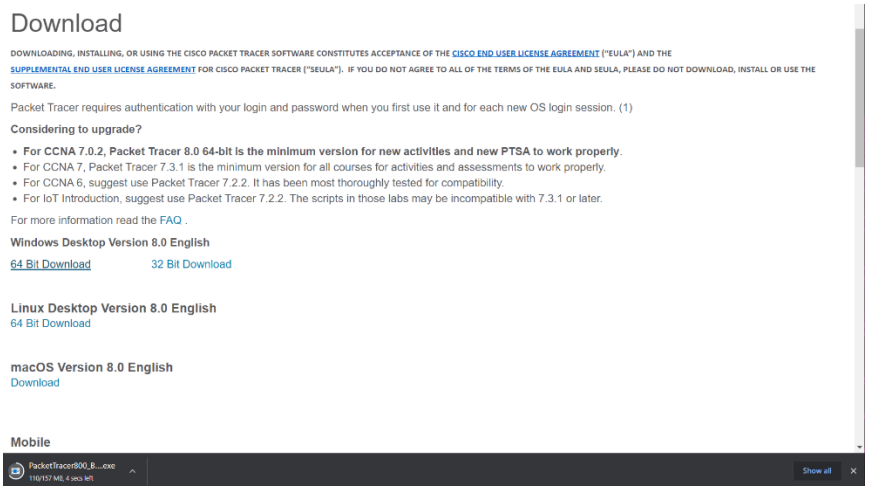
Step 2: Login and Download Cisco Packet Tracer

A. Login in with the account created by step 1.



B. Go to https://www.netacad.com/portal/resources/packet-tracer\

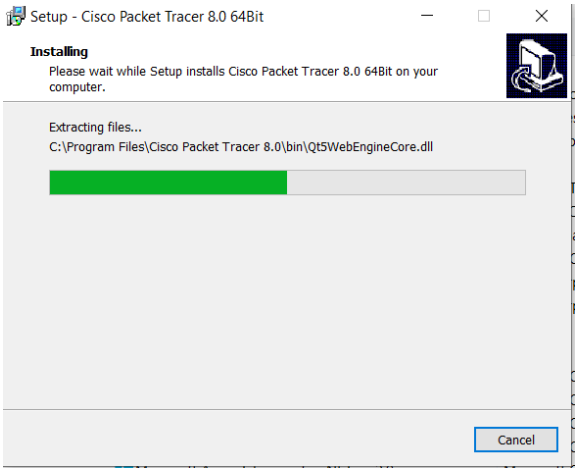
C. Download Packet tracer 8.0 (Choose the download like for your operating system"



Step 3: Installing Packet Tracer (Windows 10).

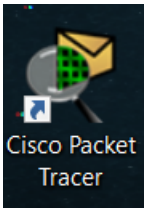
A. Open the PacketTracer800_.....signed.exe file.

B. Keep all the setting default and install the software.

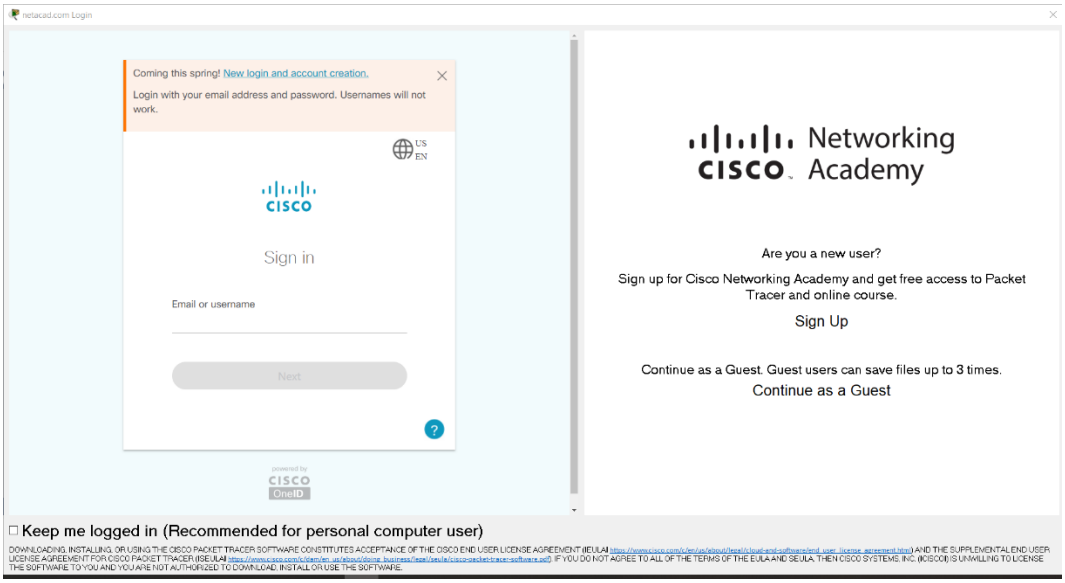


Step 4: Opening and testing Packet Tracer.

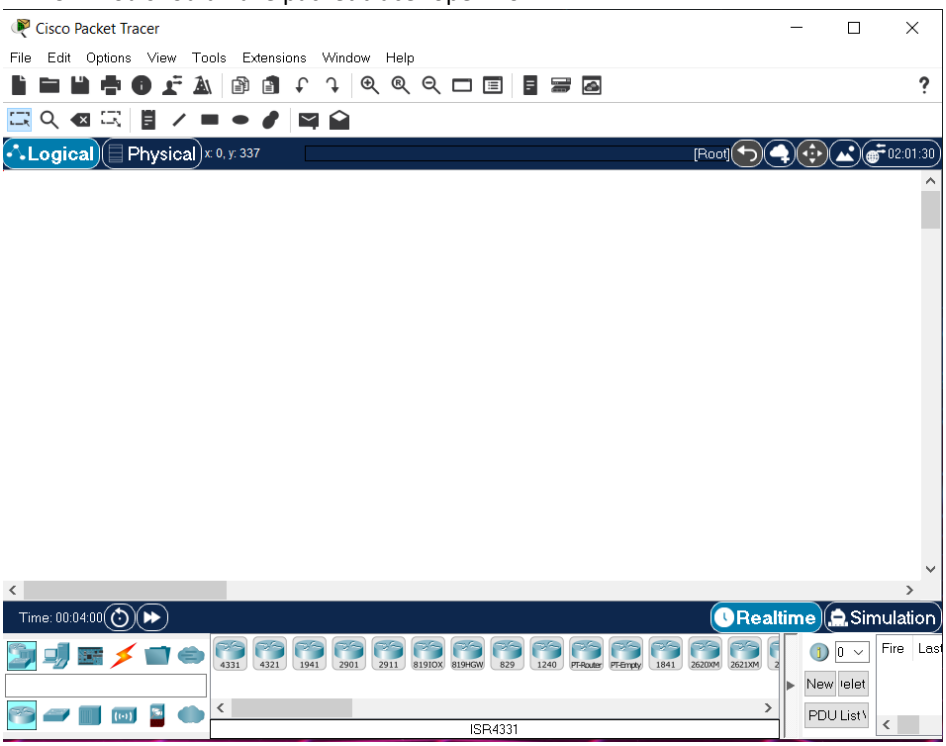
A. Find the Cisco Packet Tracer (note: it should be on desktop if you installed it using default settings.)



B. Use account created in step 1 to login into Cisco Packet Tracer



C. You should have packet tracer open now.



Packet Tracer Network Simulation: Getting Started

Learning Objectives:

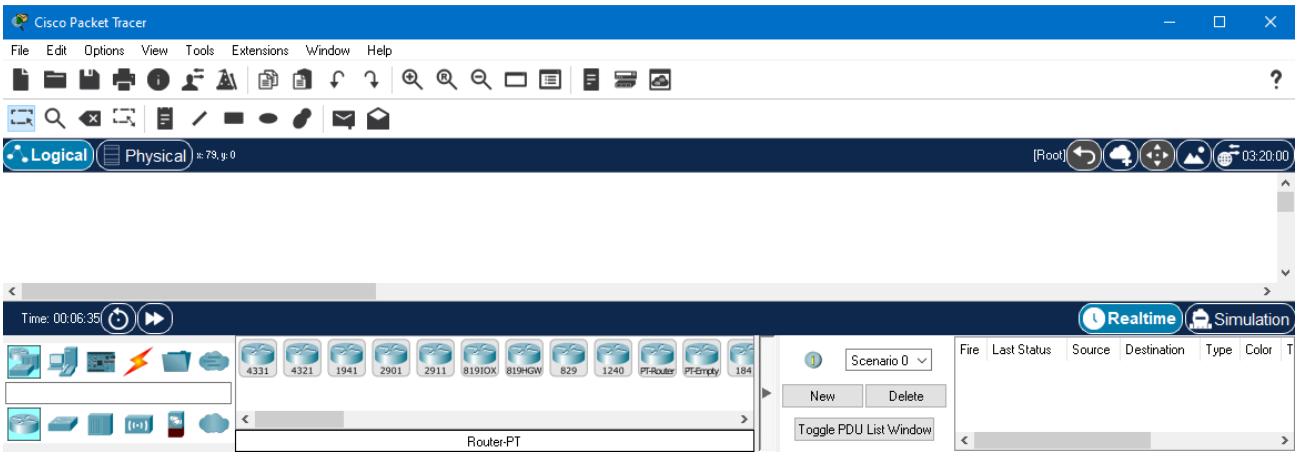
- Explore Packet Tracer Real-time mode
- Explore the Logical Workspace
- Explore Packet Tracer operation
- Connect devices
- Examine a device configuration
- Review the standard lab setup

Introduction

Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either **Real Time** or **Simulation** mode. This includes layer 2 protocols such as **Ethernet** and **PPP**, layer 3 protocols such as **IP**, **ICMP**, and **ARP**, and layer 4 protocols such as **TCP** and **UDP**. Routing protocols can also be traced.

Creating a New Topology

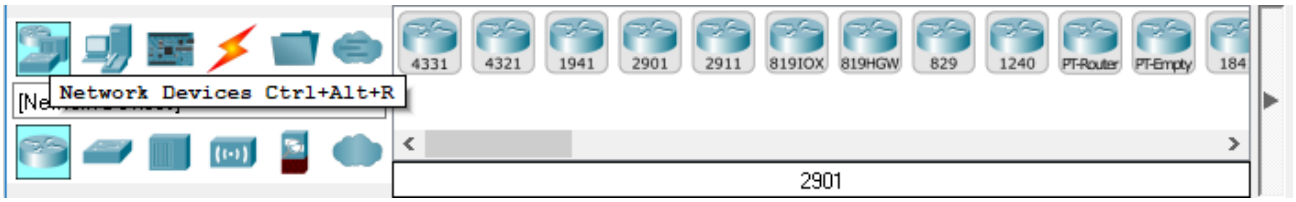
Step 1: Start Packet Tracer

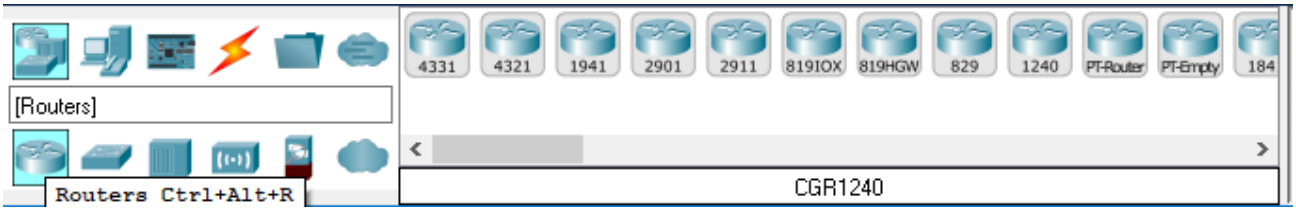


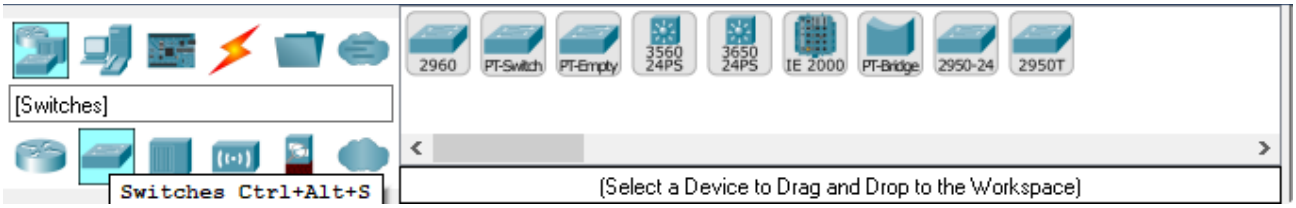
Step 2: Choosing Devices and Connections

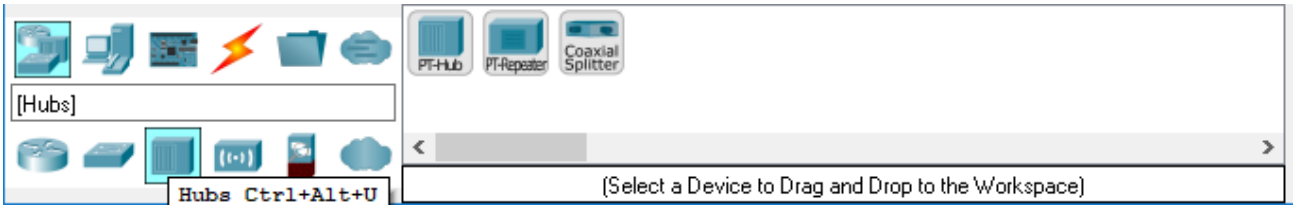
We will begin building our network topology by selecting devices and the media in which to connect them. Several types of devices and network connections can be used. For this lab we will keep it simple by using **End Devices**, **Switches**, **Hubs**, and **Connections**.

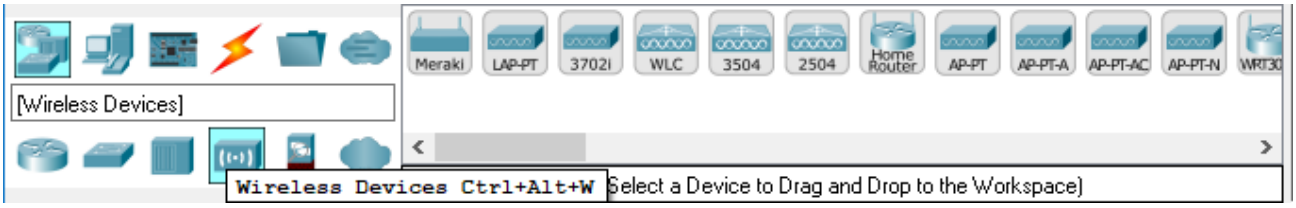
Single click on each group of devices and connections to display the various choices. The devices you see may differ slightly.

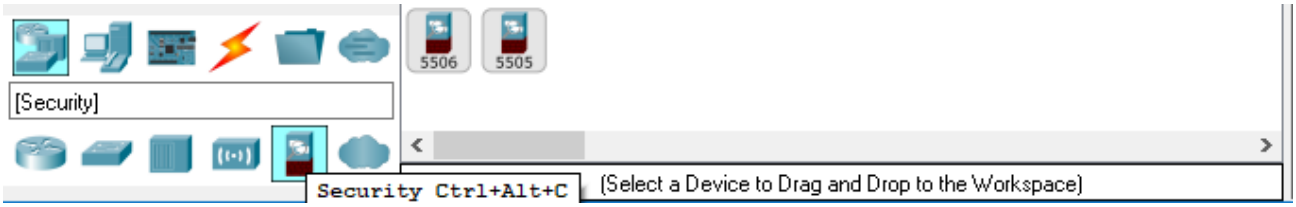


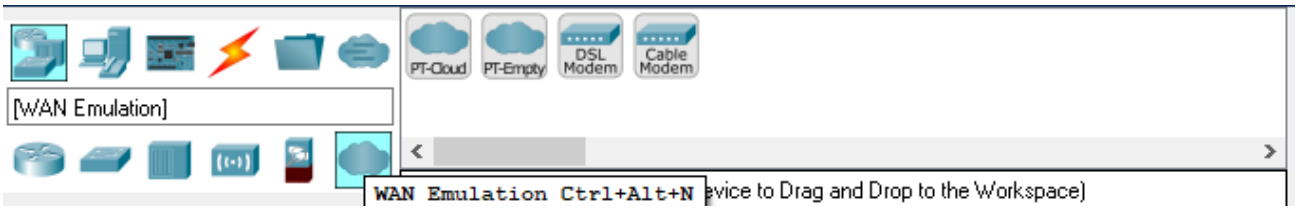



[Switches]
2960
PT-Switch
PT-Empty
3560 24PS
3650 24PS
IE 2000
PT-Bridge
2950-24
2950T
Switches Ctrl+Alt+S
(Select a Device to Drag and Drop to the Workspace)

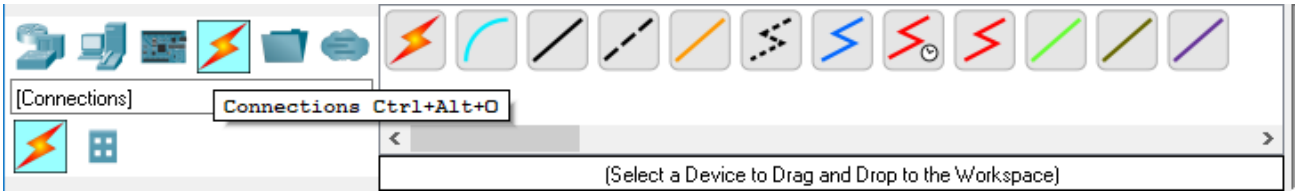

[Hubs]
PT-Hub
PT-Repeater
Coaxial Splitter
Hubs Ctrl+Alt+U
(Select a Device to Drag and Drop to the Workspace)

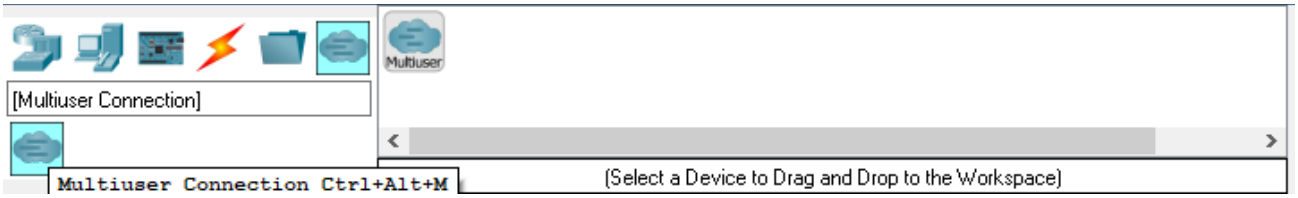

[Wireless Devices]
Meraki
LAP-PT
3702i
WLC
3504
2504
Home Router
AP-PT
AP-PT-A
AP-PT-AC
AP-PT-N
Wireless Devices Ctrl+Alt+W
Select a Device to Drag and Drop to the Workspace)


[Security]
5506
5505
Security Ctrl+Alt+C
(Select a Device to Drag and Drop to the Workspace)


[WAN Emulation]
PT-Cloud
PT-Empty
DSL Modem
Cable Modem
WAN Emulation Ctrl+Alt+N
evice to Drag and Drop to the Workspace)

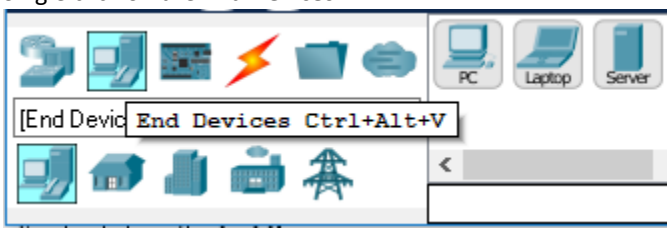

[End Devices]
End Devices Ctrl+Alt+V
PC
Laptop
Server
Network Controller
Printer
IP Phone
VoIP Device
Phone
TV
Tablet
Smart Phone
PC-PT


[Connections]
Connections Ctrl+Alt+O
(Select a Device to Drag and Drop to the Workspace)



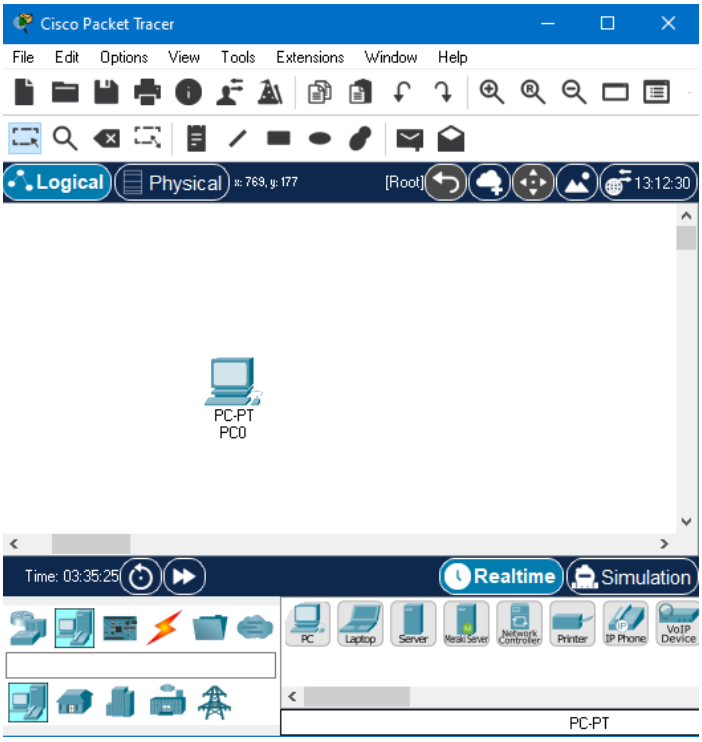
Step 3: Building the Topology – Adding Hosts

Single click on the **End Devices**



Single click on the **Generic** host (PC).

Drag and drop the “PC” icon to the workspace area.

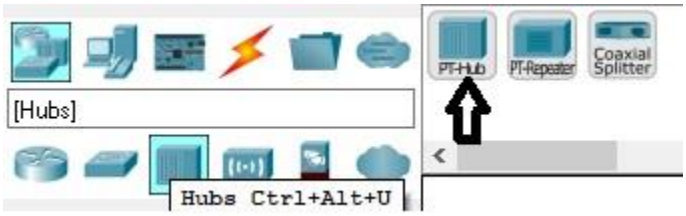


Add three more hosts.

Step 4: Building the Topology – Connecting the Hosts to Hubs and Switches

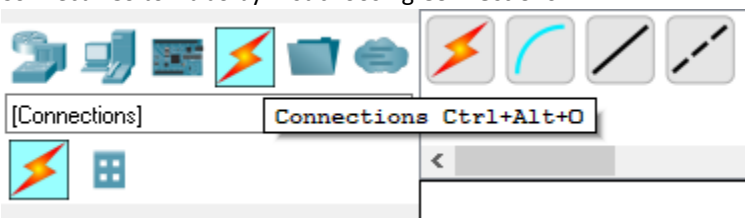
Adding a Hub

Select a hub, by clicking once on **Hubs** and once on a **Generic** hub (PT-Hub).



Add the hub by dragging and dropping the “PT-Hub” icon below PC0 and PC1.

Connect **PC0** to **Hub0** by first choosing **Connections**.

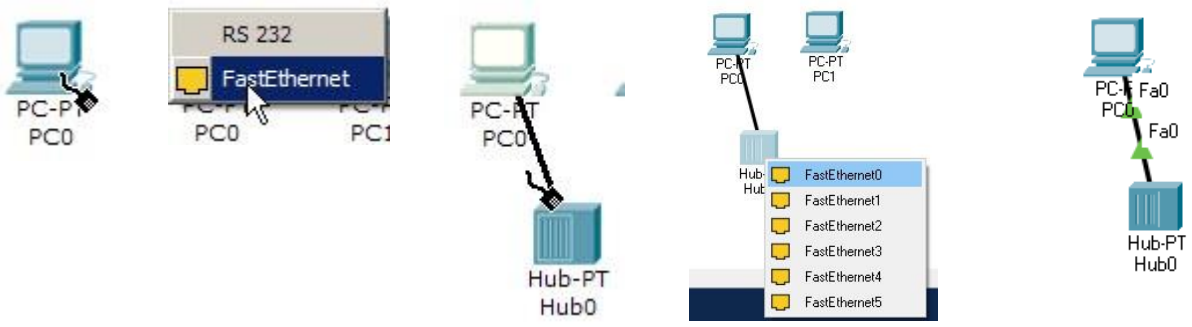


Click once on the **Copper Straight-through** cable.

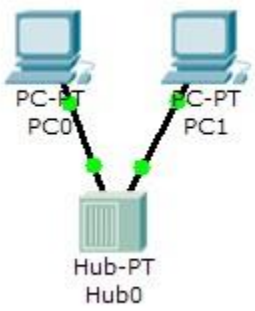
Perform the following steps to connect **PC0** to **Hub0**:

1. Click once on **PC0**
2. Choose **FastEthernet**
3. Drag the cursor to **Hub0**
4. Click once on **Hub0** and choose **FastEthernet0**
5. Notice the green link lights on both the **PC0** Ethernet NIC and the **Hub0** FastEthernet0 showing that the link is active.

1 2 3 4 5

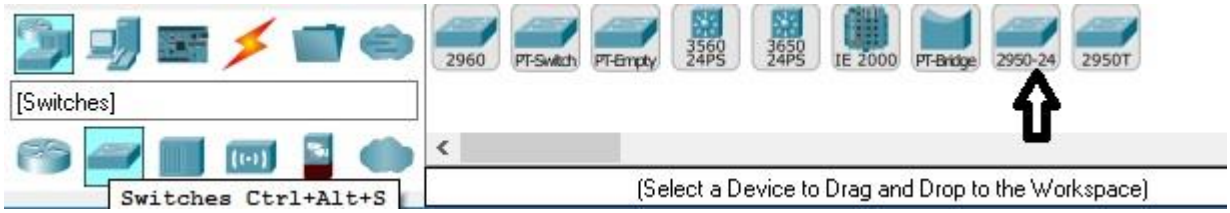


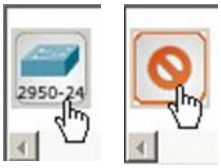
Repeat the steps above for **PC1** connecting it to **FastEthernet1** on **Hub0**. (The actual hub interface you choose does not matter.)



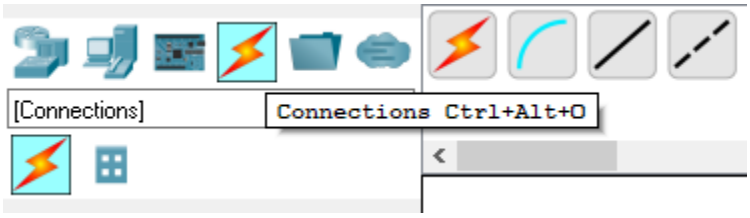
Adding a Switch

Select a switch, by clicking once on Switches and once on a **2950-24** switch.





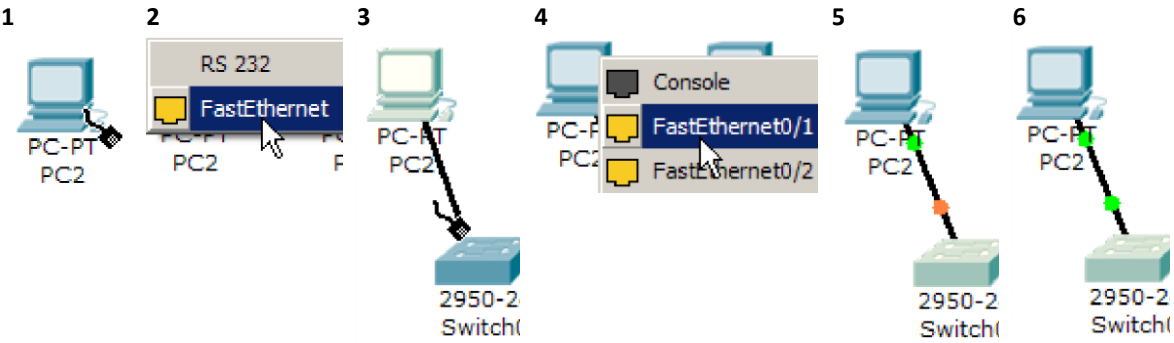
Add the switch by moving the plus sign "**+**" below **PC2** and **PC3** and click once.



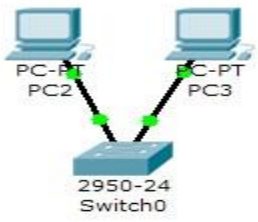
Click once on the **Copper Straight-through** cable.

Perform the following steps to connect **PC2** to **Switch0**:

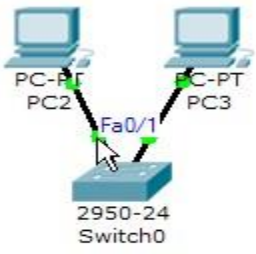
1. Click once on **PC2**
2. Choose **FastEthernet**
3. Drag the cursor to **Switch0**
4. Click once on **Switch0** and choose **FastEthernet0/1**
5. Notice the green link lights on **PC2** Ethernet NIC and amber light **Switch0** FastEthernet0/1 port. The switch port is temporarily not forwarding frames, while it goes through the stages for the Spanning Tree Protocol (STP) process.
6. **After about 30 seconds** the amber light will change to green indicating that the port has entered the forwarding stage. Frames can now be forwarded out the switch port.



Repeat the steps above for **PC3** connecting it to Port 3 on **Switch0** on port **FastEthernet0/2**. (The actual switch port you choose does not matter.)



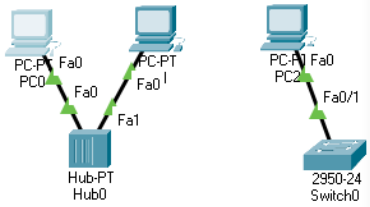
Move the cursor over the link light to view the port number. **Fa** means FastEthernet, 100 Mbps Ethernet.

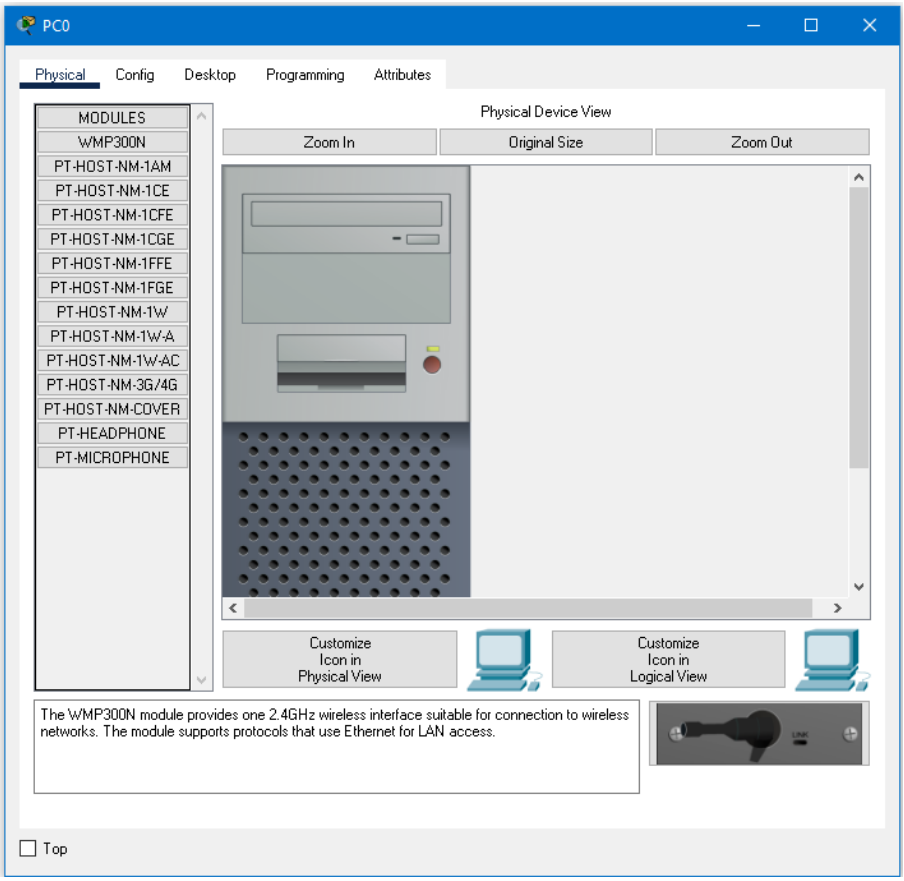


Step 5: Configuring IP Addresses and Subnet Masks on the Hosts

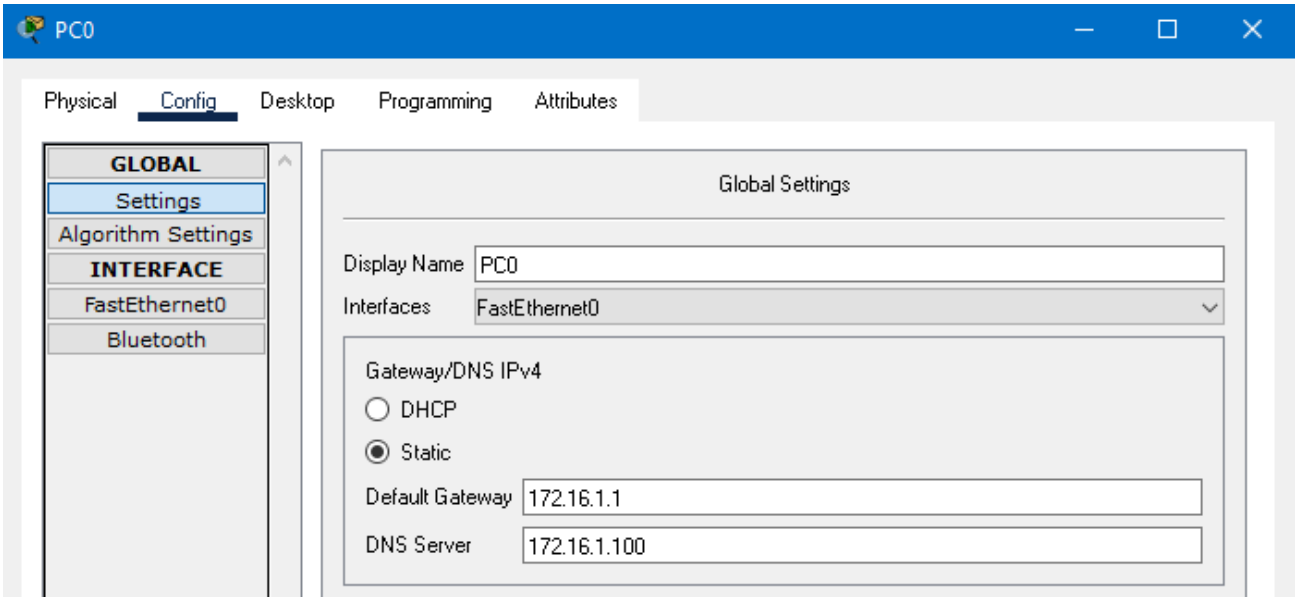
Before we can communicate between the hosts we need to configure IP Addresses and Subnet Masks on the devices.

Click once on **PC0**.

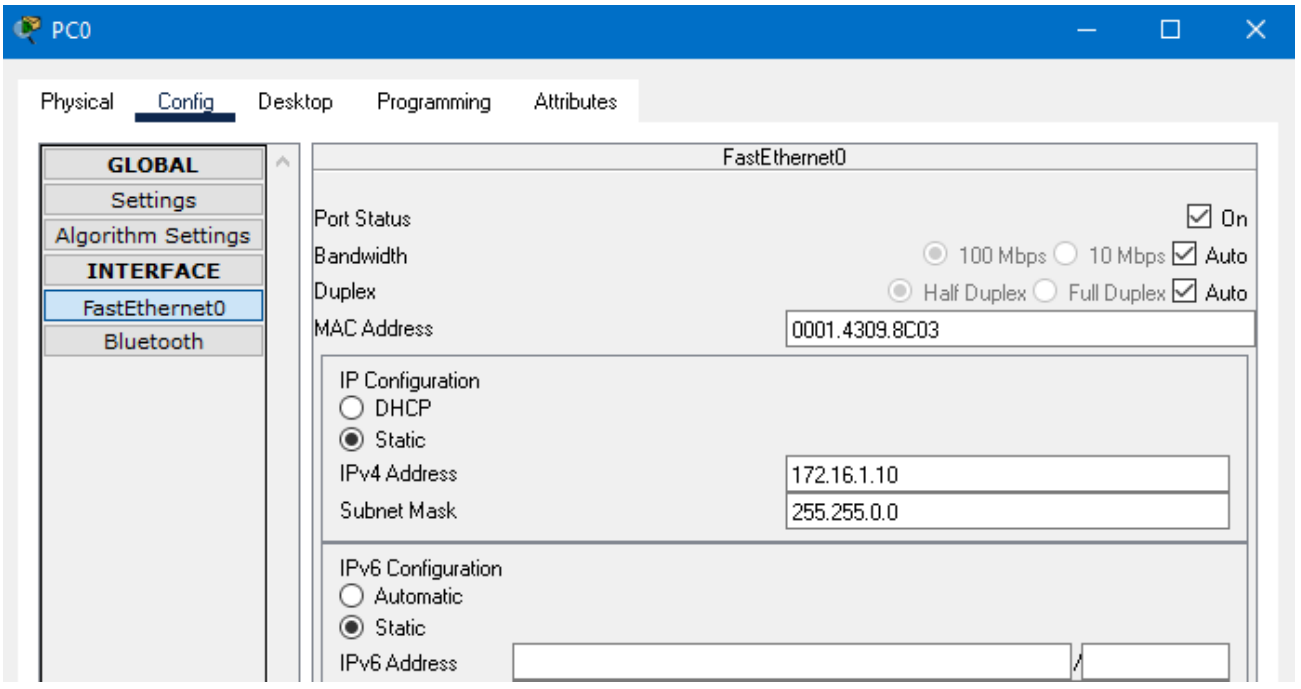




Choose the **Config** tab and click on **Settings**. It is here that you can change the name of **PC0**. It is also here where you would enter a **Gateway** IP Address, also known as the default gateway and the **DNS Server** IP Address. We will discuss this later, but this would be the IP address of the local router. If you want, you can enter the Gateway IP Address **172.16.1.1** and DNS Server IP Address **172.16.1.100**, although it will not be used in this lab.



Click on **INTERFACE** and then **FastEthernet**. Add the **IP Address 172.16.1.10**. Click once in the **Subnet Mask** field to enter the default Subnet Mask. You can leave this at **255.255.0.0**.



Also, notice this is where you can change the **Bandwidth** (speed) and **Duplex** of the Ethernet NIC (Network Interface Card). The default is **Auto** (autonegotiation), which means the NIC will negotiate with the hub or switch. The bandwidth and/or duplex can be manually set by removing the check from the Auto box and choosing the specific option.

Bandwidth - Auto

If the host is connected to a hub or switch port which can do 100 Mbps, then the Ethernet NIC on the host will choose 100 Mbps (Fast Ethernet). Otherwise, if the hub or switch port can only do 10 Mbps, then the Ethernet NIC on the host will choose 10 Mbps (Ethernet).

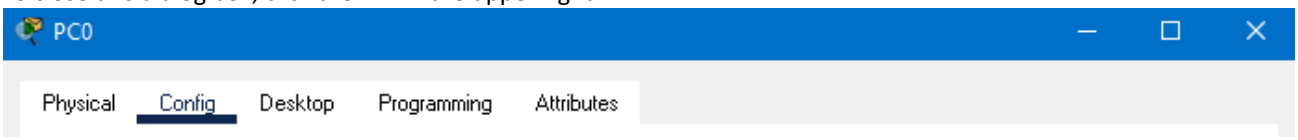
Duplex - Auto

Hub: If the host is connected to a hub, then the Ethernet NIC on the host will choose Half Duplex.

Switch: If the host is connected to a switch, and the switch port is configured as **Full Duplex** (or Autonegotiation), then the Ethernet NIC on the host will choose Full Duplex. If the switch port is configured as **Half Duplex**, then the Ethernet NIC on the host will choose Half Duplex. (Full Duplex is a much more efficient option.)

The information is automatically saved when entered.

To close this dialog box, click the "**X**" in the upper right.

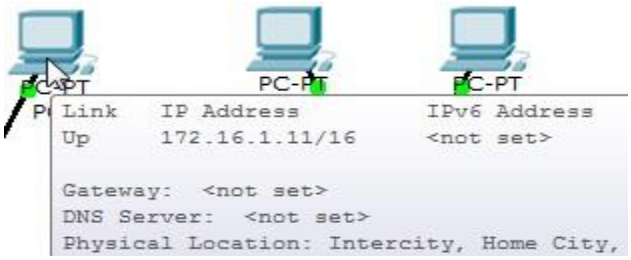


Repeat these steps for the other hosts. Use the information below for IP Addresses and Subnet Masks.

Host	IP Address	Subnet Mask
PC0	172.16.1.10	255.255.0.0
PC1	172.16.1.11	255.255.0.0
PC2	172.16.1.12	255.255.0.0
PC3	172.16.1.13	255.255.0.0

Verify the information

To verify the information that you entered, move the Select tool (arrow) over each host.

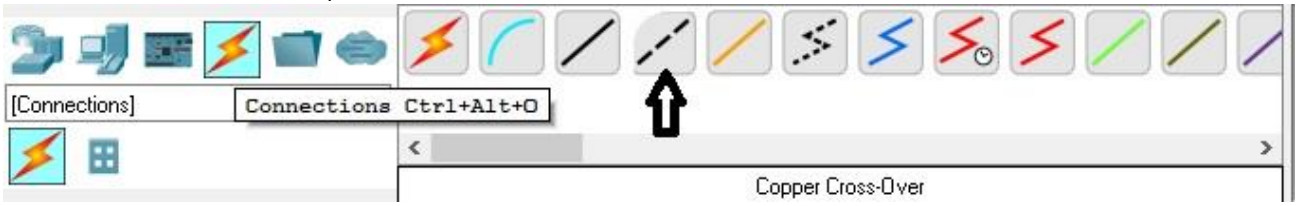


Deleting a Device or Link

To delete a device or link, choose the Delete tool and click on the item you wish to delete.

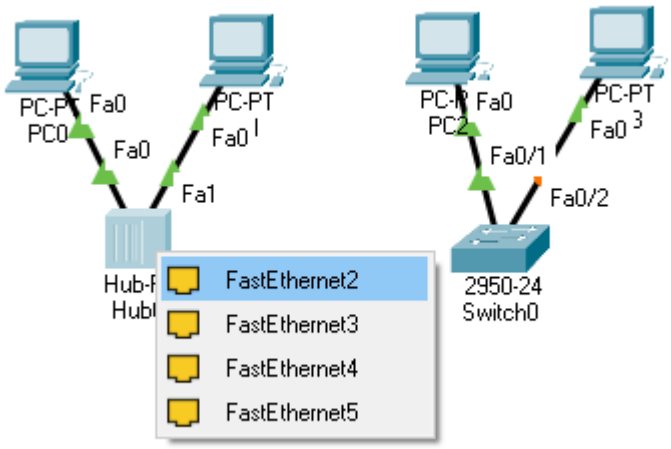
Step 6: Connecting Hub0 to Switch0

To connect like-devices, like a Hub and a Switch, we will use a Cross-over cable. Click once the **Cross-over** Cable from the **Connections** options.

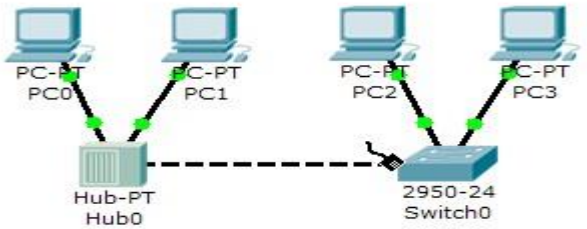


Move the **Connections** cursor over **Hub0** and click once.

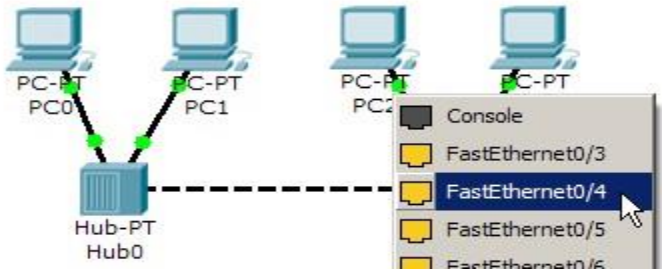
Select **FastEthernet2** (actual interface does not matter).



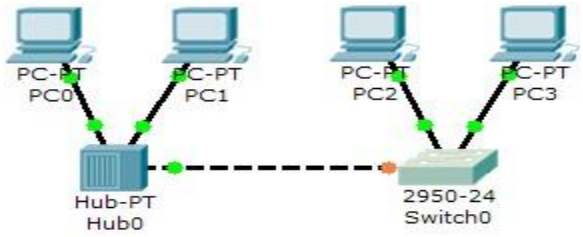
Move the **Connections** cursor to **Switch0**.

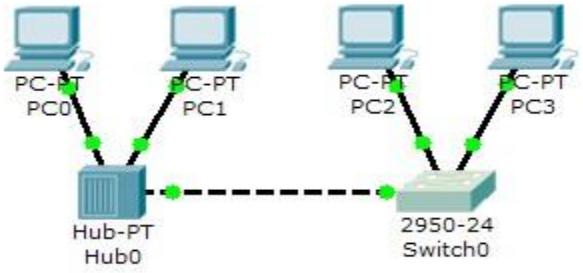


Click once on **Switch0** and choose **FastEthernet0/4** (actual interface does not matter).



The link light for switch port **FastEthernet0/4** will begin as amber and eventually change to green as the Spanning Tree Protocol transitions the port to forwarding.



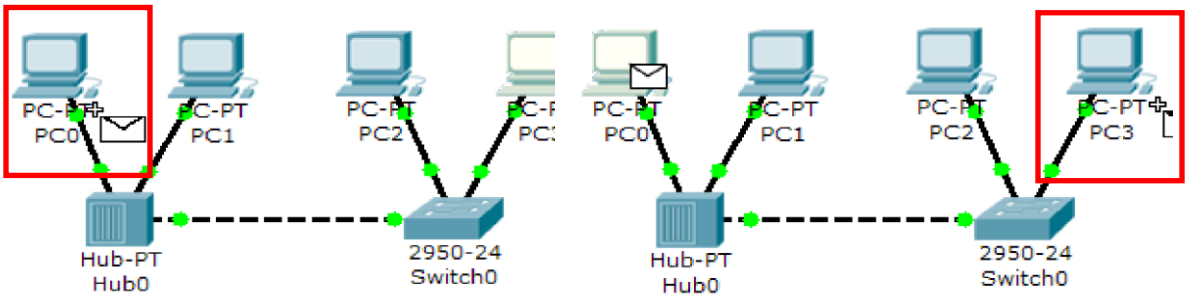


Step 7: Verifying Connectivity in Realtime Mode

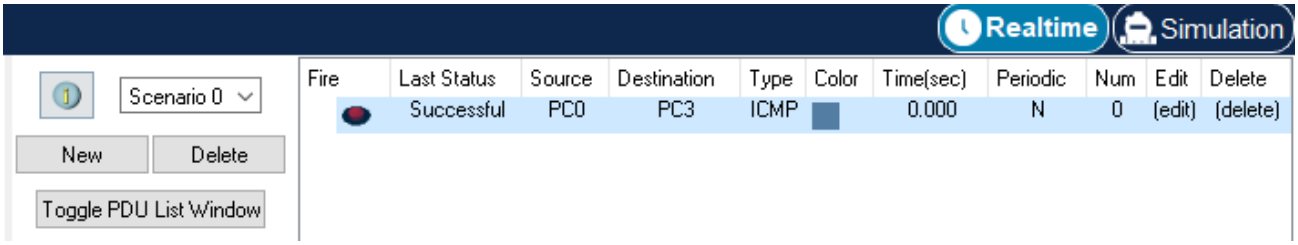
Be sure you are in **Realtime** mode.

Select the **Add Simple PDU** tool used to ping devices.

Click once on **PC0**, then once on **PC3**.



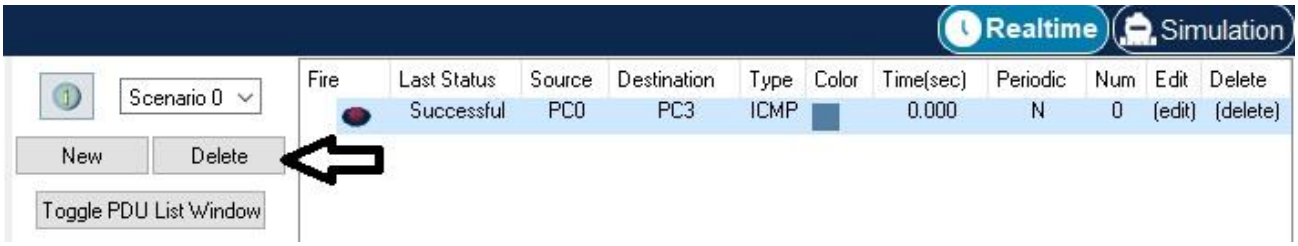
The PDU **Last Status** should show as Successful.



Resetting the Network

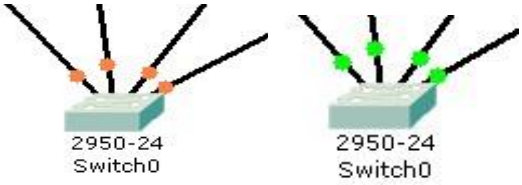
At this point we will want to reset the network, whenever you want to reset the network and begin the simulation again, perform the following tasks:

Click **Delete** in the PDU area.



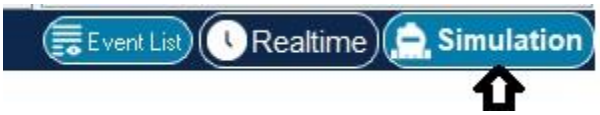
Waiting for Spanning Tree Protocol (STP)

Note: Because Packet Tracer also simulates the Spanning Tree Protocol, at times the switch may show amber lights on its interfaces. You will need to wait for the lights to turn green on the switches before they will forward any Ethernet frames.

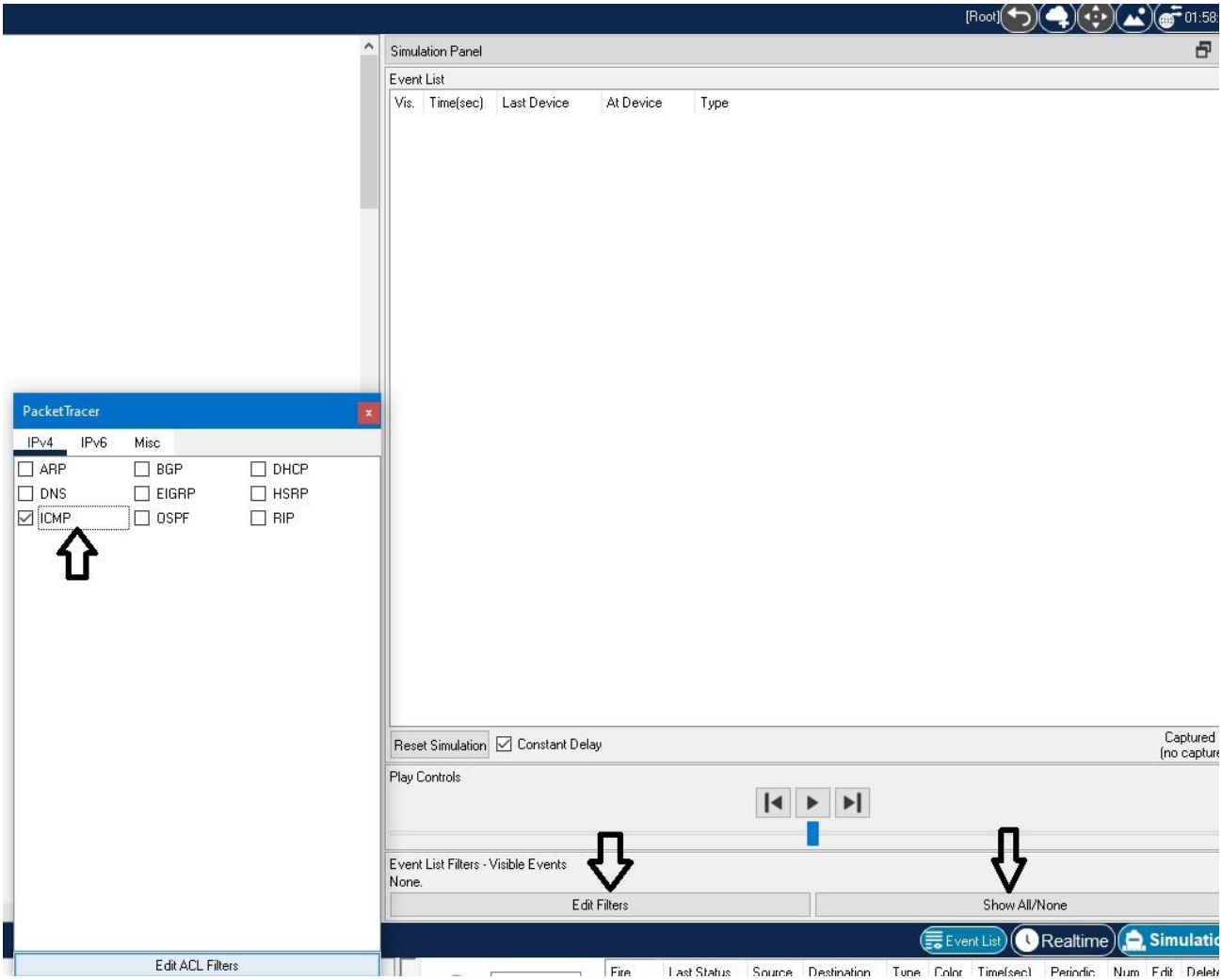


Step 8: Verifying Connectivity in Simulation Mode

Be sure you are in Simulation mode.

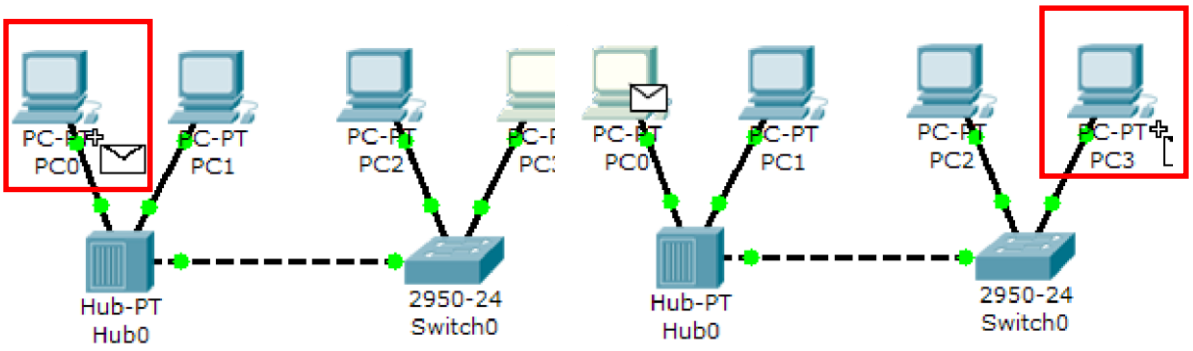


Click on **Edit Filters** and then deselect all filters (**Show All/None**) and select only **ICMP**.

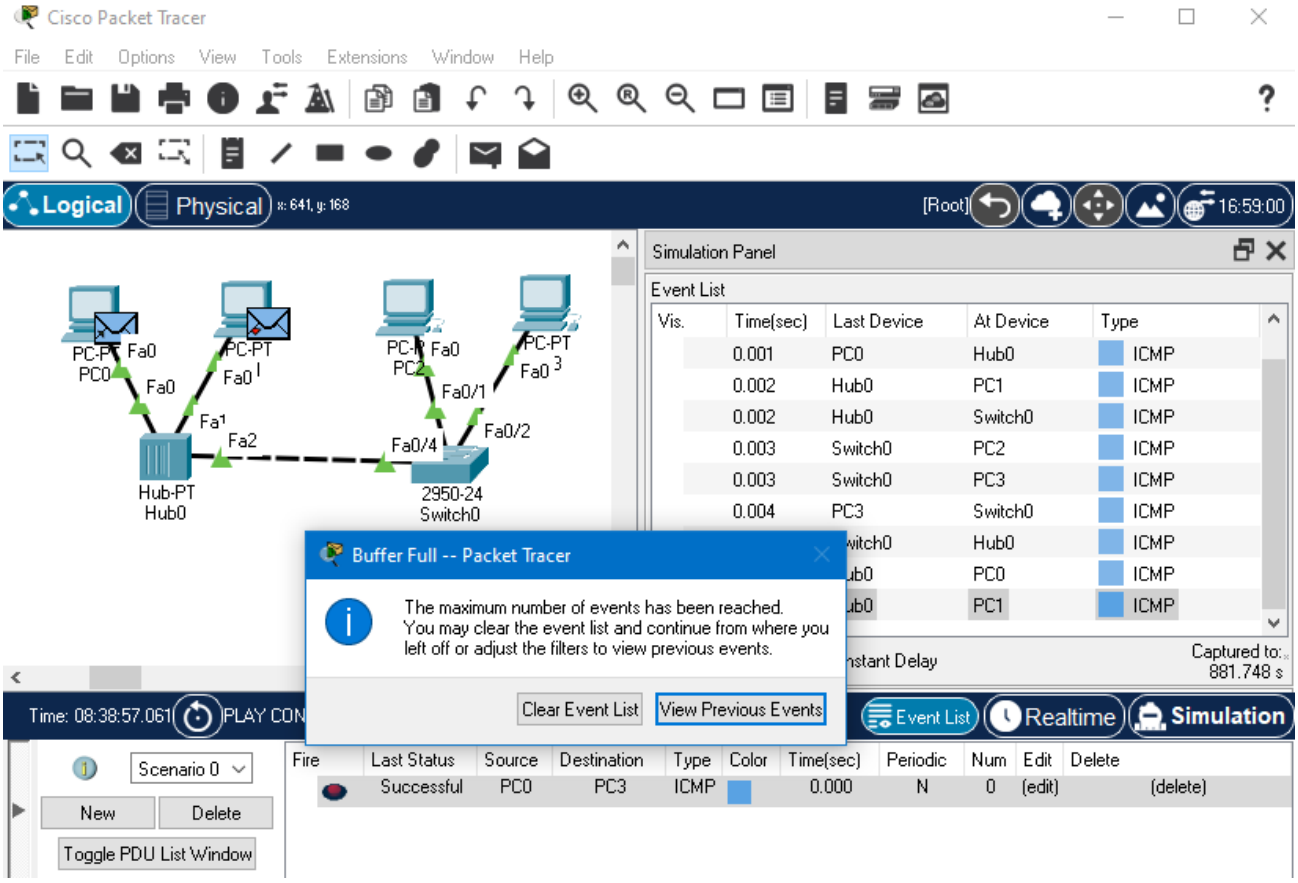


Select the **Add Simple PDU** tool used to ping devices.

Click once on **PC0**, then once on **PC3**.

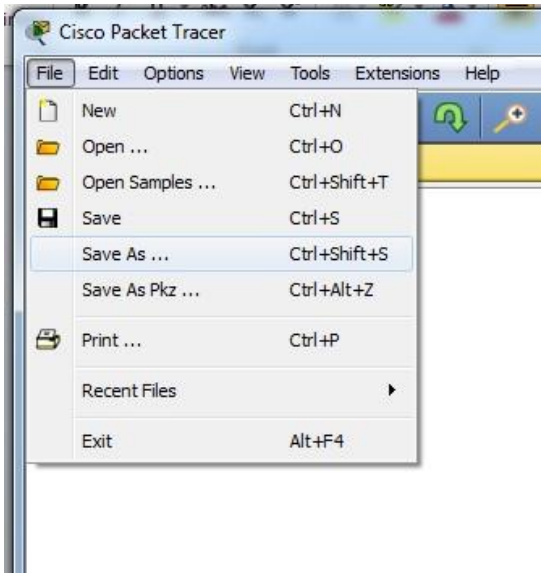


Continue clicking **Capture/Forward** button until the ICMP ping is completed. You should see the ICMP messages move between the hosts, hub and switch. The PDU **Last Status** should show as **Successful**. Click on **Clear Event List** if you do not want to look at the events or click **Preview Previous Events** if you do. For this exercise it does not matter.

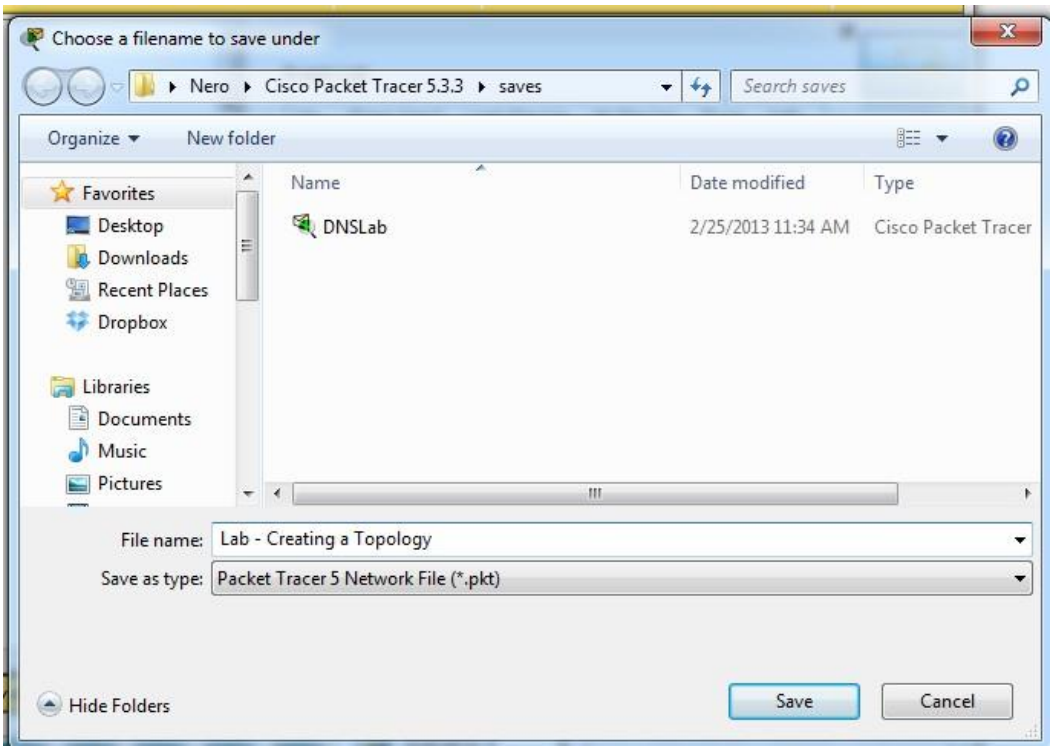


Step 9: Saving the Topology

Perform the following steps to save the topology (uses **.pkt** file extension).
Go to **File** > **Save As …**

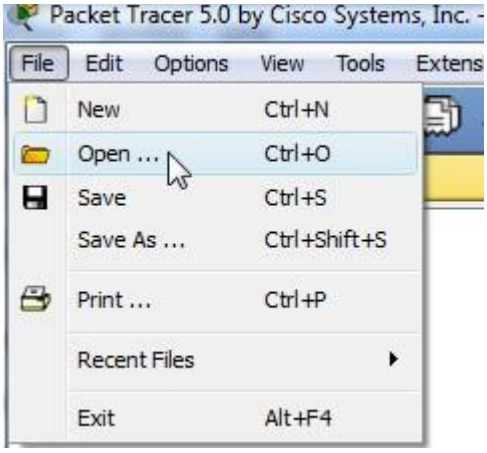


Enter an appropriate file name in the **Save as** dialog box.

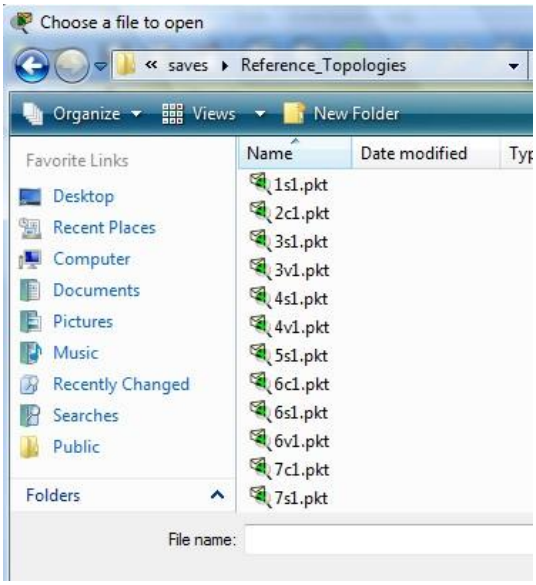


Opening Existing Topologies

Go to **File > Open**

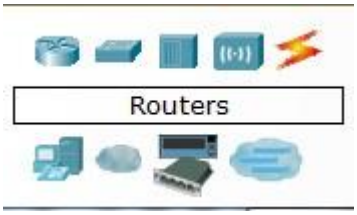


Browse to the file location of the topology you want to open, select it and click **Open**.



EXAMPLE – CONFIGURING A SIMPLE TOPOLOGY WITH ROUTER

- ✓ Click the router's icon in the Device Area at the bottom

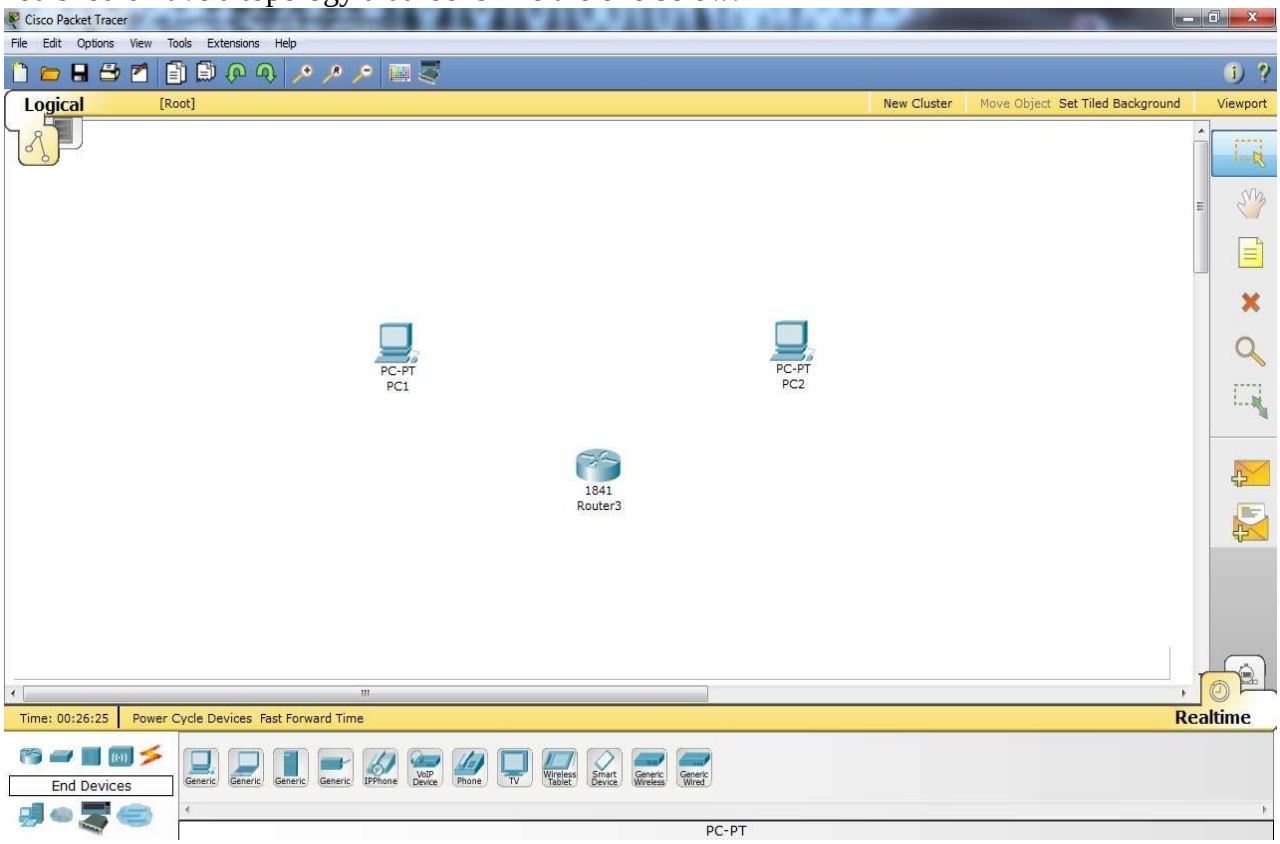


Router's Icon Device Area

- ✓ Select the **1841 Router**, move your mouse to the Workspace and click to place the Router. Alternatively, you can drag the Router to the workspace.
- ✓ Move your mouse to the Device Area and click **End Devices**
- ✓ Select the **Generic PC**, and drag to the Workspace

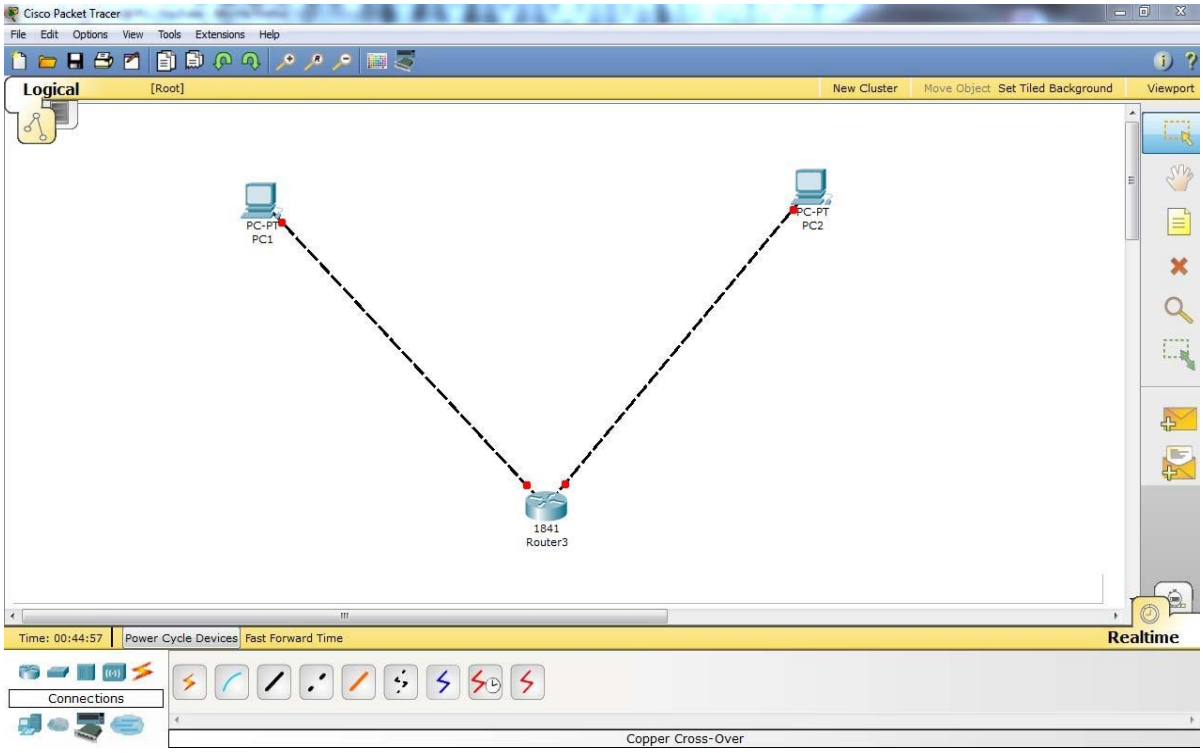
- ✓ Repeat the same procedure to add another PC

You should have a topology that looks like the one below.



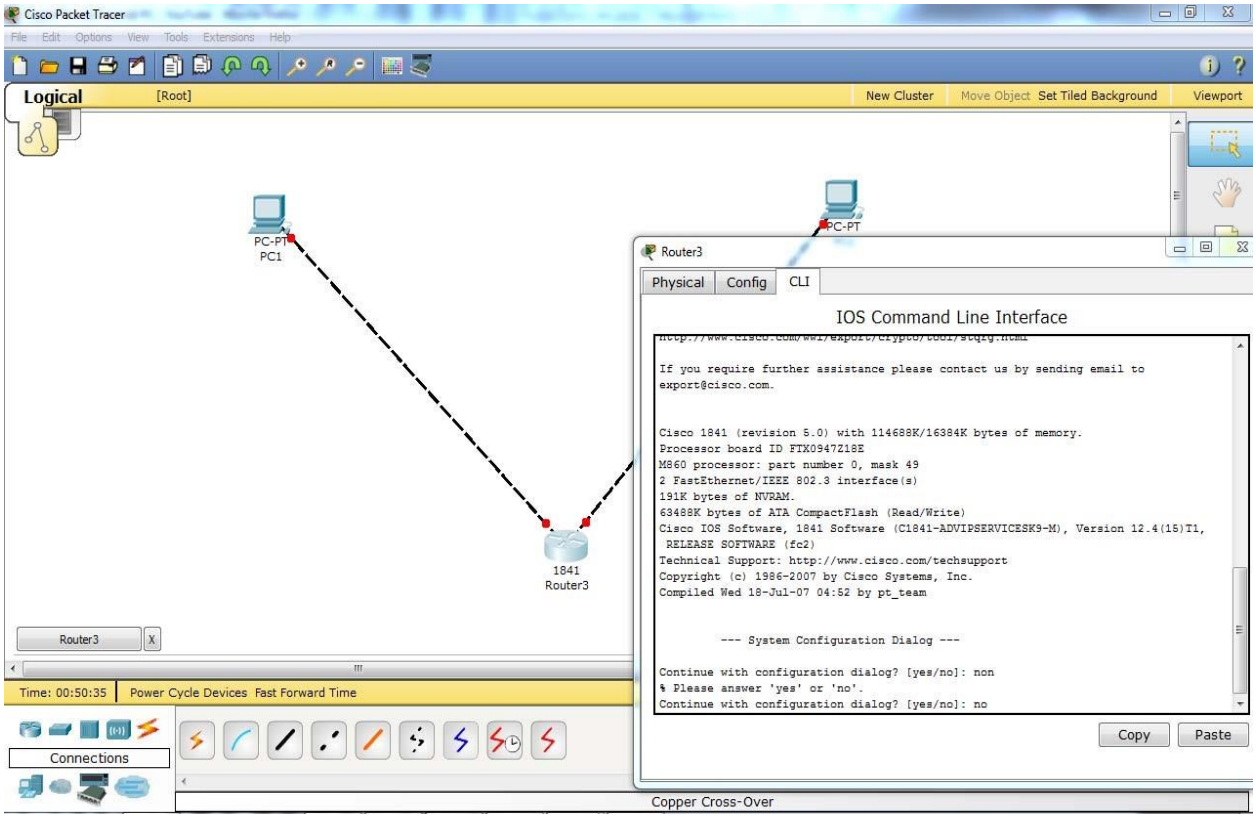
- ✓ To connect these devices, move your mouse to the Device Area and click **Connections.** Next, select the **Copper Cross-over** cable. Click on PC1, click on FastEthernet to connect the cable to the PC's FastEthernet's interface and drag to the Router, and click on FastEthernet0/0 interface.
- ✓ Next, click on the **Copper Cross-over** cable, click on PC2, click on PC's 2 FastEthernet interface and drag to the Router and connect it to the Router's FastEthernet's 0/1 interface.

Your network topology should look like the one below.



To configure Router 3:

- ✓ Click Router 3, and click on the Command Line Interface represented by the CLI tab ✓ Next, type **no** to the question "Continue with configuration dialog? [yes/no]: " ✓ You should see a window that looks like the one below.



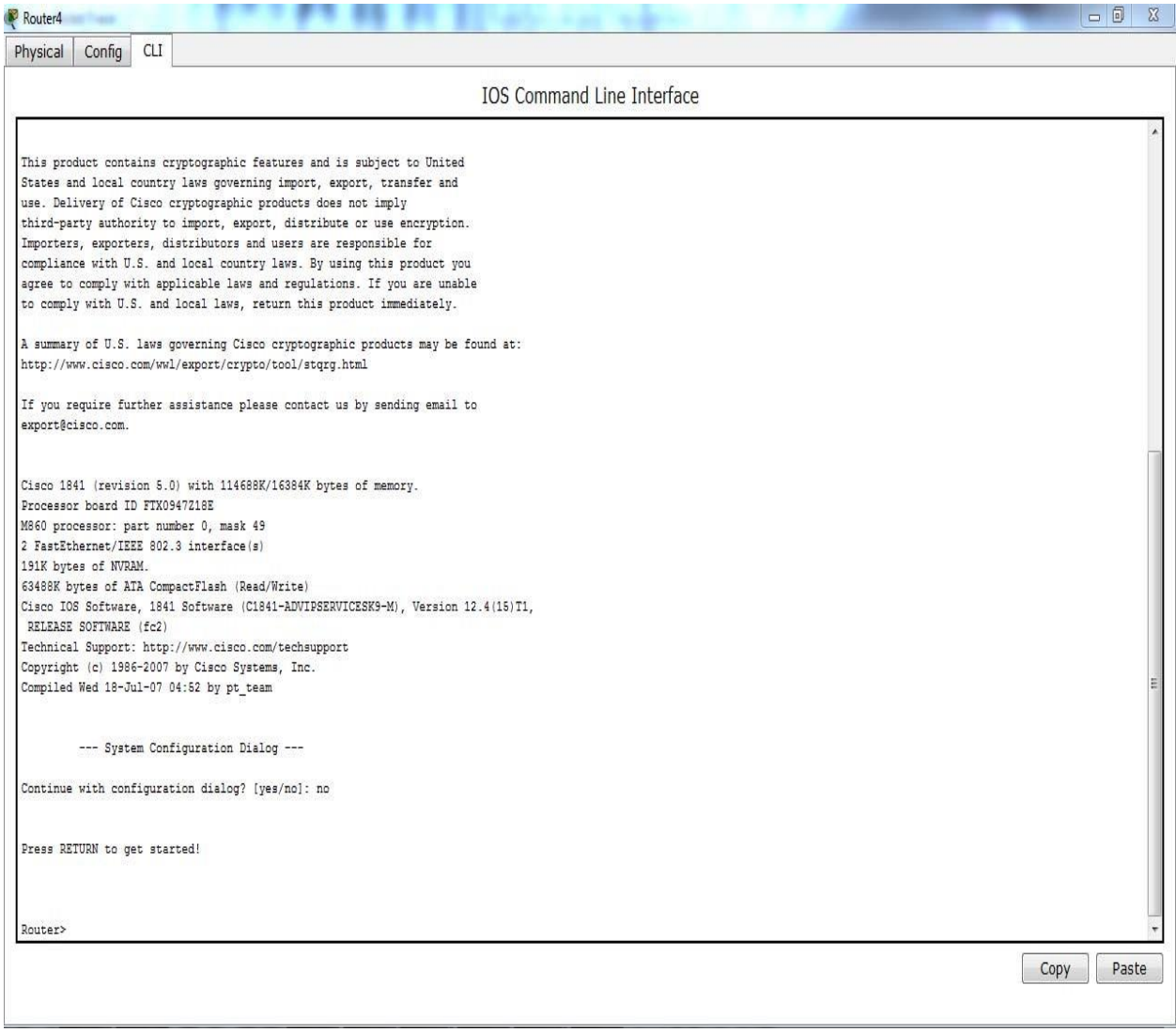
✓ Hit ***Ente***r to start the configuration.

Before we proceed with the configuration, we need to understand the three basic Cisco IOS command modes namely the ***USER MODE***, the ***PRIVILEGED MODE***, and the ***GLOBAL CONFIGURATION MODE***.

When you first get into a Cisco device, you start in the mode called the **USER MODE (User Exec)** depicted by the name of the Router and a right angled bracket (>) next to it. i.e. **Router>.** You cannot do much in this mode. You can only do some basic show commands and Ping commands in this mode.

To be able to do much more, you need to move to the **PRIVILEGED MODE (Privileged Exec)** depicted by the name of the Router followed by the #symbol i.e. **Router**#. To move from the User Mode to the Privileged mode, use the **enable** or **en** command. At the Privileged mode, you can view anything on the Router, unlike the User Mode that is Limited. However, from the Privileged Mode, you can only do verification and show commands, but you cannot configure anything on the Router. So, to be able to configure the router, we need to move to the **GLOBAL CONFIGURATION MODE** depicted by **Router(Conifg)#.** To move from the Privileged mode to the Global Configuration Mode, use the **configure terminal** or **conf t** command. In the Global Configuration Mode, we can configure any global settings on the Router and settings that affect a particular interface. To exit from a particular user mode, you use the **exit**, **end** or **CTRL+Z command.**

Now that we understand the Cisco IOS commands modes, let us proceed with the



configuration of the Router. Your command Line interface should look like the one below. This is the **USER MODE**. Now we need to move to the Privileged mode with the **enable** or **en** command. After each command, hit the ***Enter key*** to move to the next command line.

- ✓ Next, we use the command **configure terminal** or **conf t** command to enter the global configuration mode as shown below.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

- ✓ To name our Router, we use the command **hostname** followed by the name we want to assign to the router. For this tutorial, let us name this router Wissink1.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Wissink1
Wissink1(config)#
```

Note that after we input the command **hostname Wissink1**, the name of the router changes from Router to Wissink1.

- ✓ Next, we need to set an encrypted password for logging into our Router in the privileged mode. So we use the command **enable secret** followed by the password we intend to use. Let us use **pa$$word** as our password for this tutorial.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/
Router(config)#hostname Wissink1
Wissink1(config)#enable secret pa$$word
Wissink1(config)#
```

- ✓ We need to configure a password for the console line (the console password for the Router). We enter the commands **line con o** to enter the line configuration mode and the command password **pa$$word1** to set the password to **pa$$word1** and type in **login** to prompt for the password as shown below.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#hostname Wissink1
Wissink1(config)#enable secret pa$$word
Wissink1(config)#line con 0
Wissink1(config-line)#password pa$$word1
Wissink1(config-line)#login
Wissink1(config-line)#
```

Next, we need to configure the password for the virtual terminal lines (the telnet password). To do this we need to use the command **exit** to go back to the Global configuration mode from the line configuration mode. In the global configuration mode, enter the commands **line vty 0 4**, **password pa$$word2** and **login** to prompt for the password and **exit** to return to the global configuration mode as shown below.

```
Wissink1(config-line)#exit
Wissink1(config)#line vty 0 4
Wissink1(config-line)#password pa$$word2
Wissink1(config-line)#login
Wissink1(config-line)#exit
Wissink1(config)#
```

Next, we need to configure IP addresses for our Router. To do this, we need to configure the FastEthernet interfaces. First, let us assign an IP address to the FastEthernet0/0 interface. To do this, we enter the commands **interface FastEthernet0/0 to** enter the interface configuration mode.

```
Wissink1(config-line)#exit
Wissink1(config)#line vty 0 4
Wissink1(config-line)#password pa$$word2
Wissink1(config-line)#login
Wissink1(config-line)#exit
Wissink1(config)#interface FastEthernet0/0
Wissink1(config-if)#
```

Next, enter the IP address and the **no shutdown** command (turns on the interface) as shown below.

```
Wissink1(config)#interface Fastethernet0/0
Wissink1(config-if)#ip address 192.168.60.65 255.255.255.252
Wissink1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state t
o up
```

Next, we need to configure the FastEthernet0/1 interface. To do this, we need to **exit** to the global configuration mode and repeat the step above as shown below.

```
Wissink1(config-if)#exit
Wissink1(config)#interface FastEthernet0/1
Wissink1(config-if)#ip address 192.168.60.81 255.255.255.252
Wissink1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state t
o up

Wissink1(config-if)#
```

We have successfully configured the two interfaces of our Router. We can check this configuration by entering the command **end** to go back to the privileged mode and entering the command **show running-config** to display the current configuration (all the configuration we just set). Hit Enter to scroll down. You should have something similar to this:

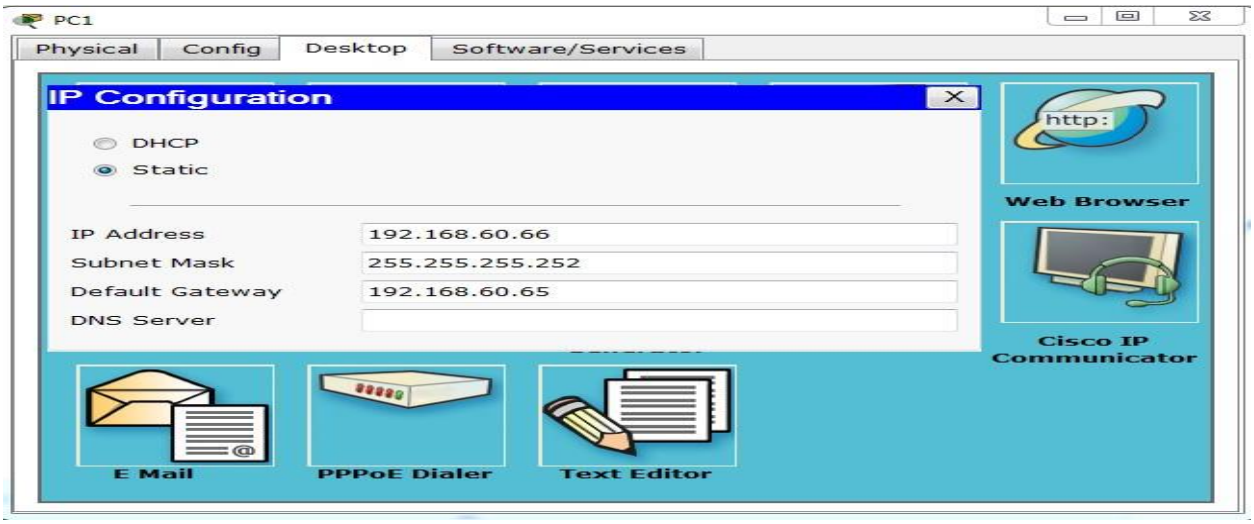
```
Wissink1(config-if)#end
Wissink1#
%SYS-5-CONFIG_I: Configured from console by console

Wissink1#show running-config
Building configuration...

Current configuration : 582 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Wissink1
!
!
!
enable secret 5 $1$mERr$9.QyFmp9dS3vbgJJxU.Gs.
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
interface FastEthernet0/0
 ip address 192.168.60.65 255.255.255.252
 duplex auto
 speed auto
!
```

```
interface FastEthernet0/0
 ip address 192.168.60.65 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 192.168.60.81 255.255.255.252
 duplex auto
 speed auto
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
!
!
!
!
!
!
!
line con 0
 password pa$$word1
 login
line vty 0 4
 password pa$$word2
 login
!
!
!
end
```

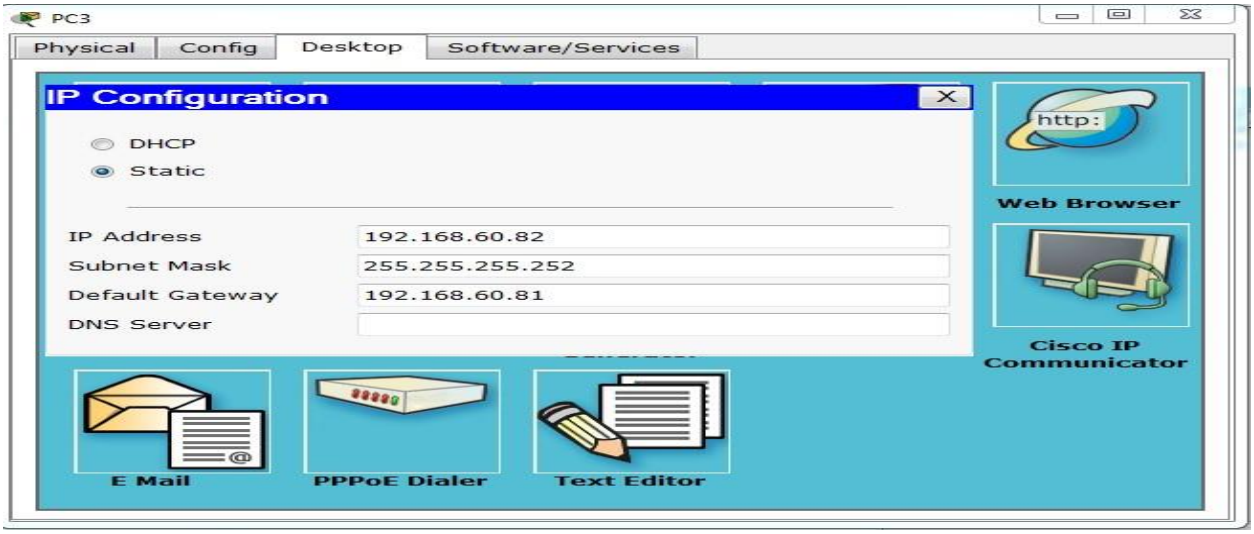
Notice that pa$$word is encrypted, but pa$$word1 and pa$$word2 are not encrypted. Next, we need to save this configuration to the NVRAM, to do this, we use the command **copy running-config startup-config** and hit ***enter*** to confirm

```
Wissink1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Wissink1#
```

Now, we can exit and close the CLI of the router and configure the PCs. To configure the PC, Click PC1, click the Desktop tab, click IP Configuration and let us set a static IP as shown below.



Close PC1 window and let us set a static IP for PC3 as shown below



Next, close PC3 window. Next, let us verify our configuration by clicking PC1 and clicking the command prompt. At the command prompt, enter **ipconfig**

```
PC>ipconfig

IP Address.....................: 192.168.60.66
Subnet Mask....................: 255.255.255.252
Default Gateway................: 192.168.60.65

PC>
```

Let us do the same for PC3

```
PC>ipconfig

IP Address.....................: 192.168.60.82
Subnet Mask....................: 255.255.255.252
Default Gateway................: 192.168.60.81

PC>
```

Now we can ping to test connectivity. Let us ping PC1 from PC3.At first, you might get a request timed out after which the ping will be successful.

```
PC>ping 192.168.60.66

Pinging 192.168.60.66 with 32 bytes of data:

Reply from 192.168.60.66: bytes=32 time=62ms TTL=127
Reply from 192.168.60.66: bytes=32 time=63ms TTL=127
Reply from 192.168.60.66: bytes=32 time=62ms TTL=127
Reply from 192.168.60.66: bytes=32 time=63ms TTL=127

Ping statistics for 192.168.60.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 62ms, Maximum = 63ms, Average = 62ms

PC>
```

Example Network Configuration

Select Router (2811) icon and drag and drop the icon to the workspace. Do it for two routers as shown in Figure 1.

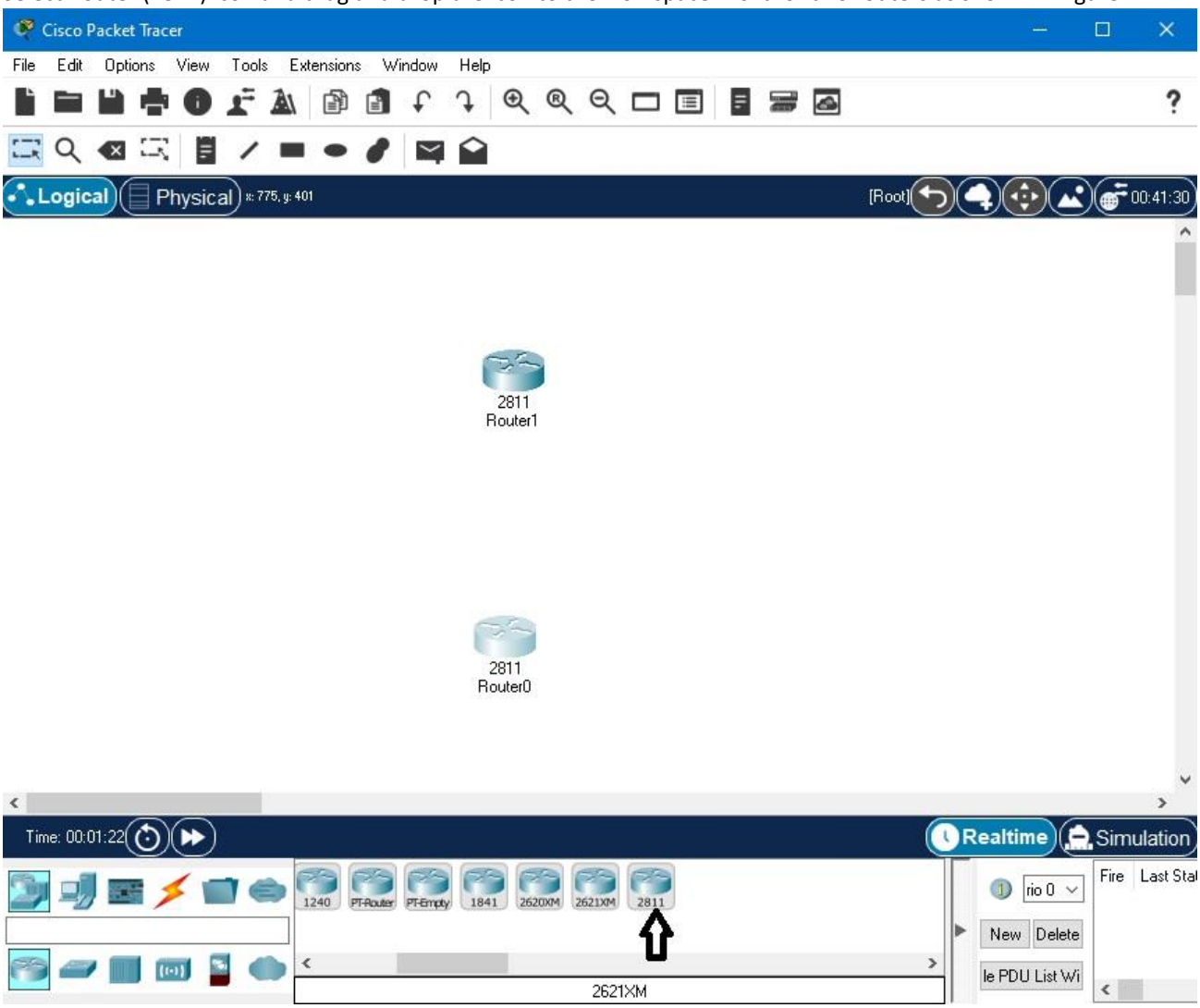


Figure 1

Connect the two routers using “Copper Cross-Over” cable connection as shown in Figure 2. Select the interfaces as shown in the figure.

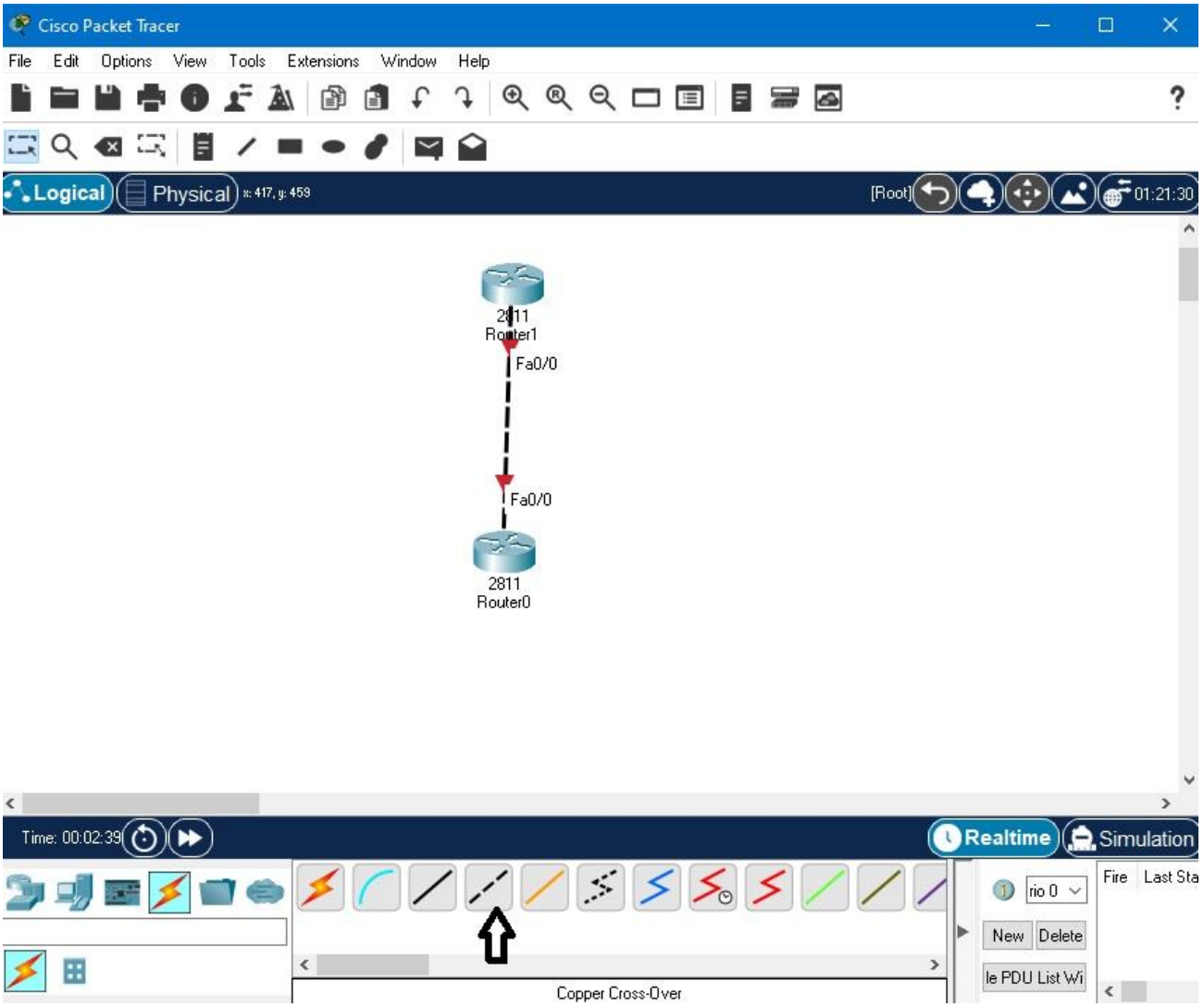


Figure 2

Select PC icon and drag and drop the icon to the workspace. Do it for Three PCs and name one PC as “PCA” as shown in Figure 3.

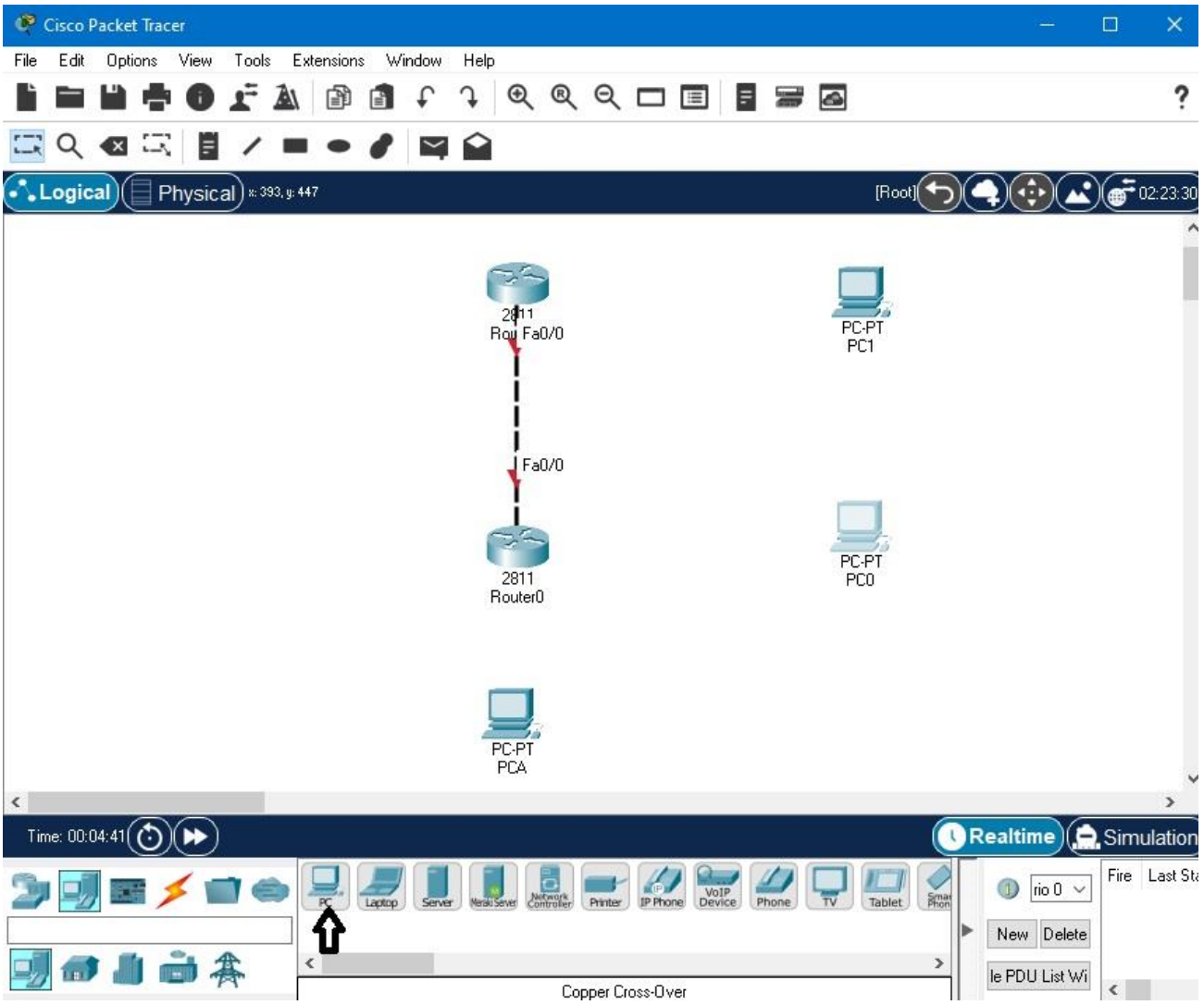


Figure 3

Select “Console” cable connection as shown in Figure 4.

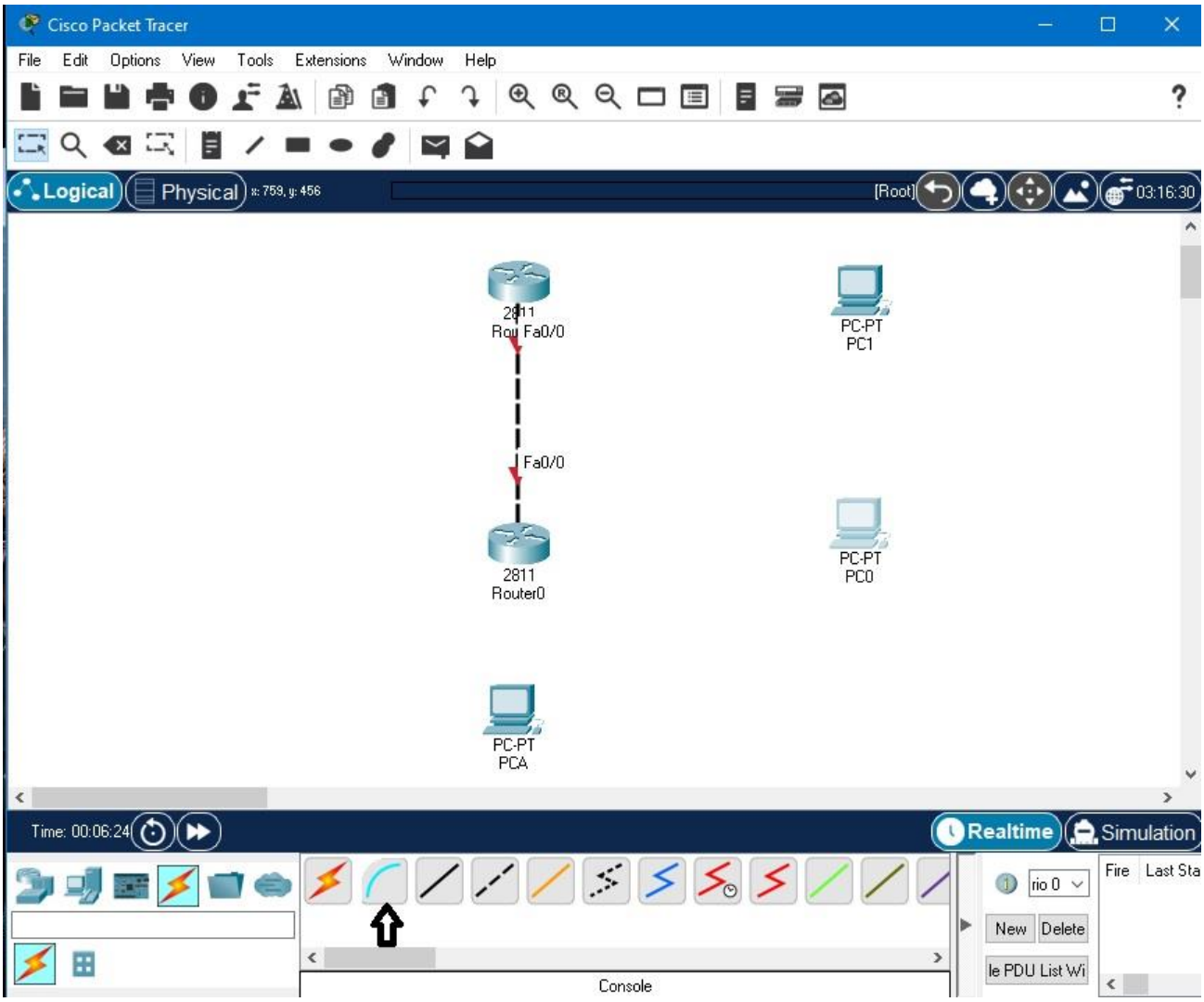


Figure 4

After selecting the connection, Press “PC0” and right-click and select “RS 232”as shown in Figure 5.

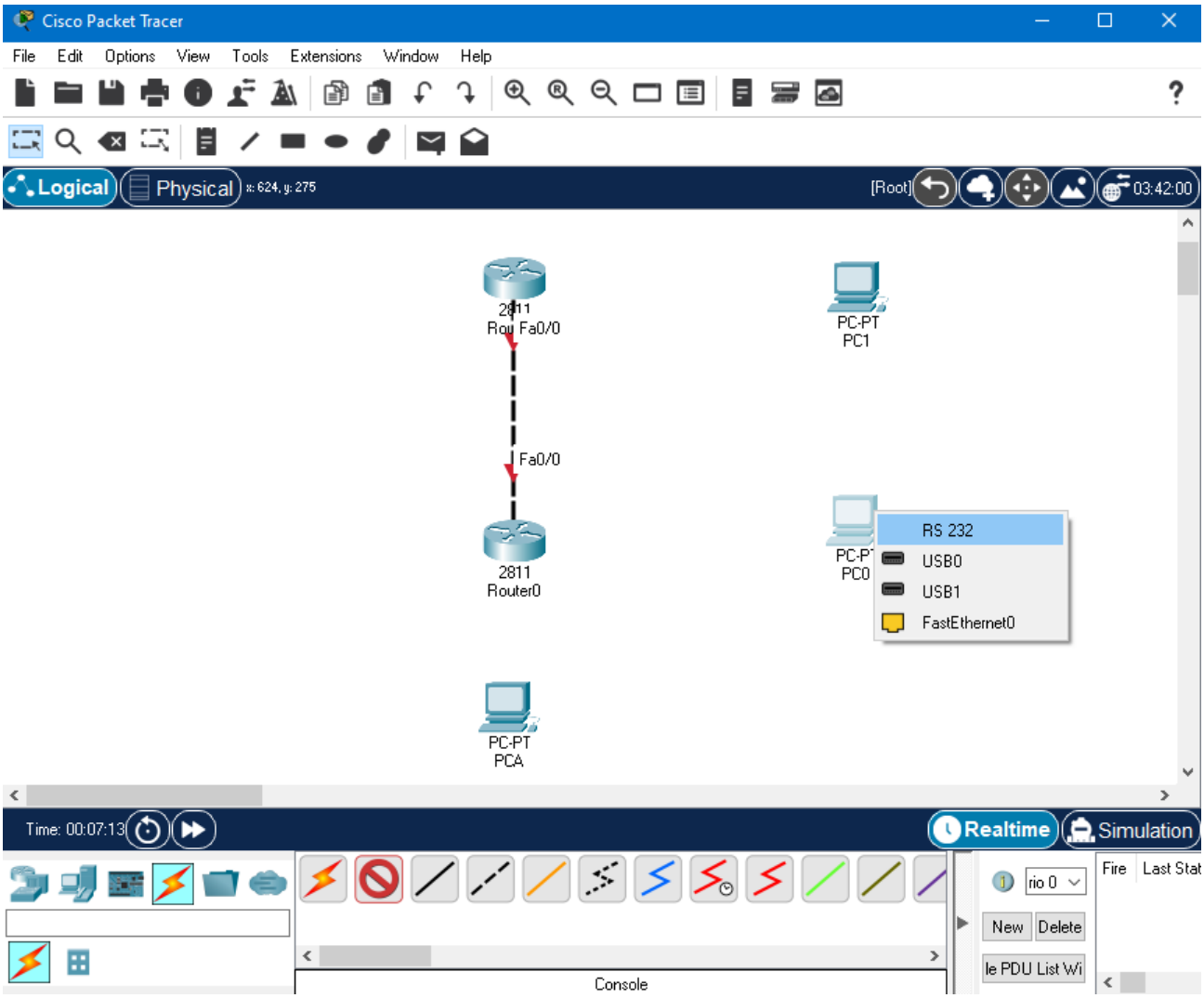


Figure 5

Right-click “Router 0” and press “Console” as shown in Figure 6.

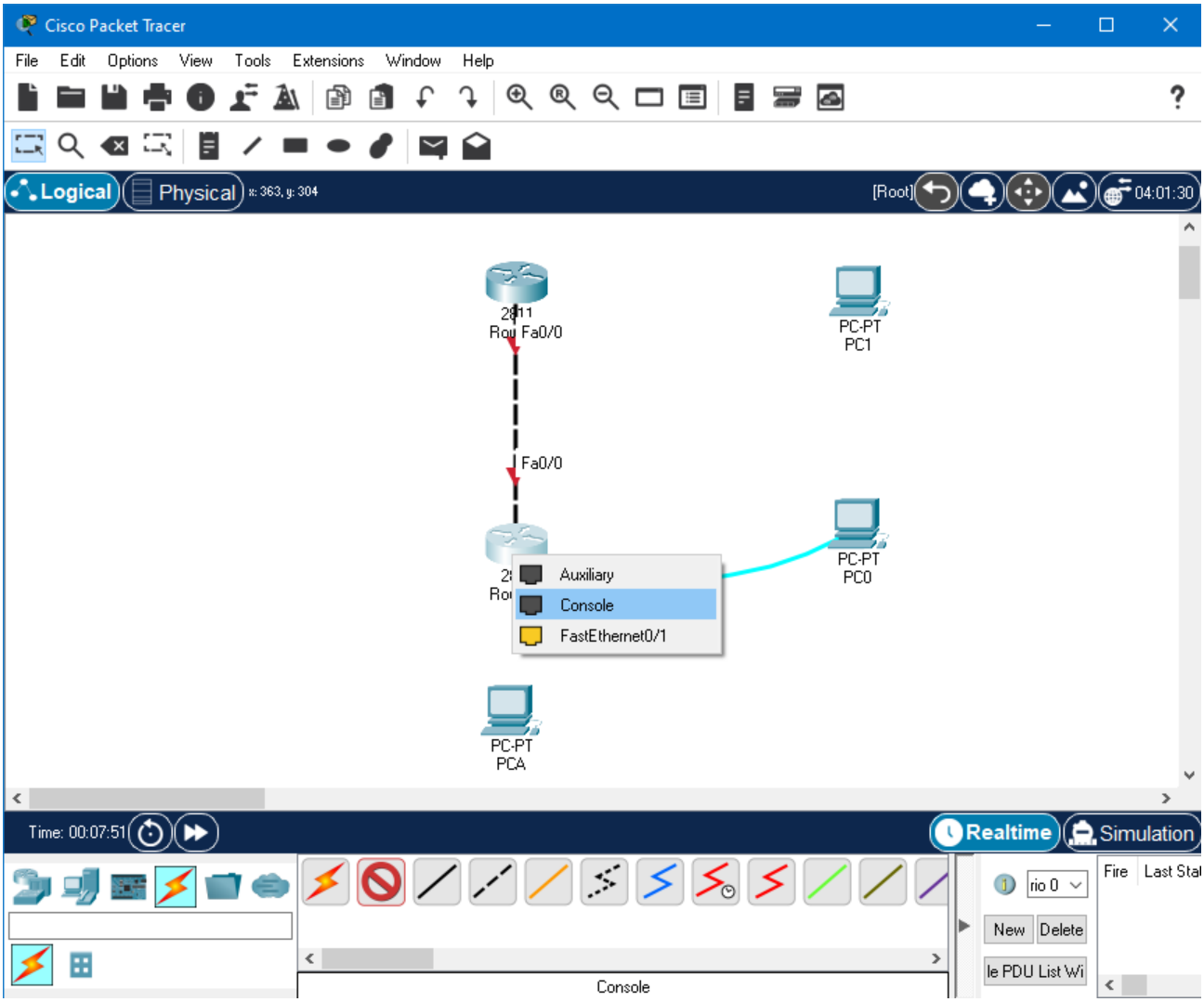


Figure 6

Connect PCA with Router A using the connection type shown in Figure 2.

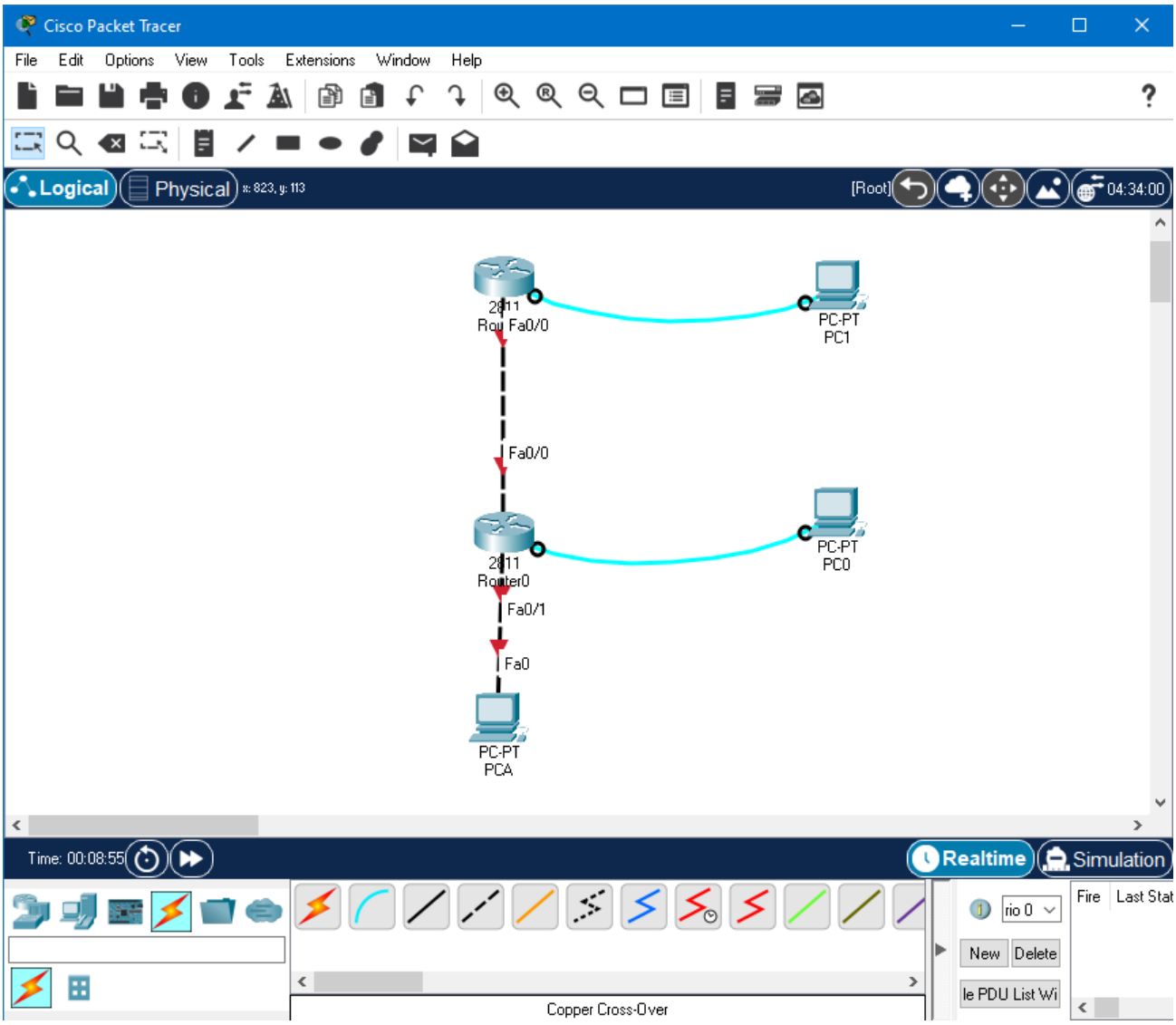


Figure 7

For grouping devices in the network select the rectangle icon shown in figure 8.

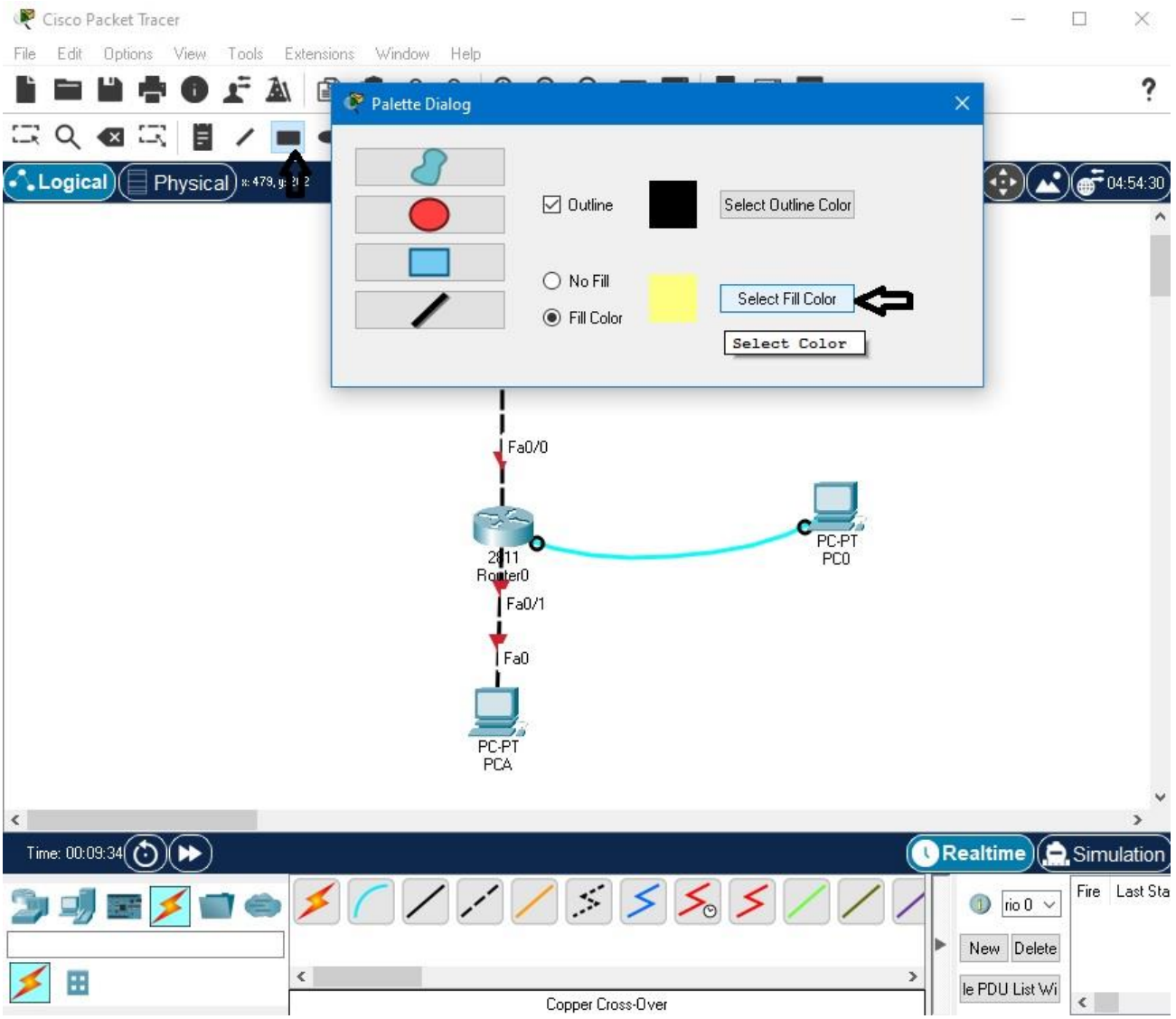


Figure 8

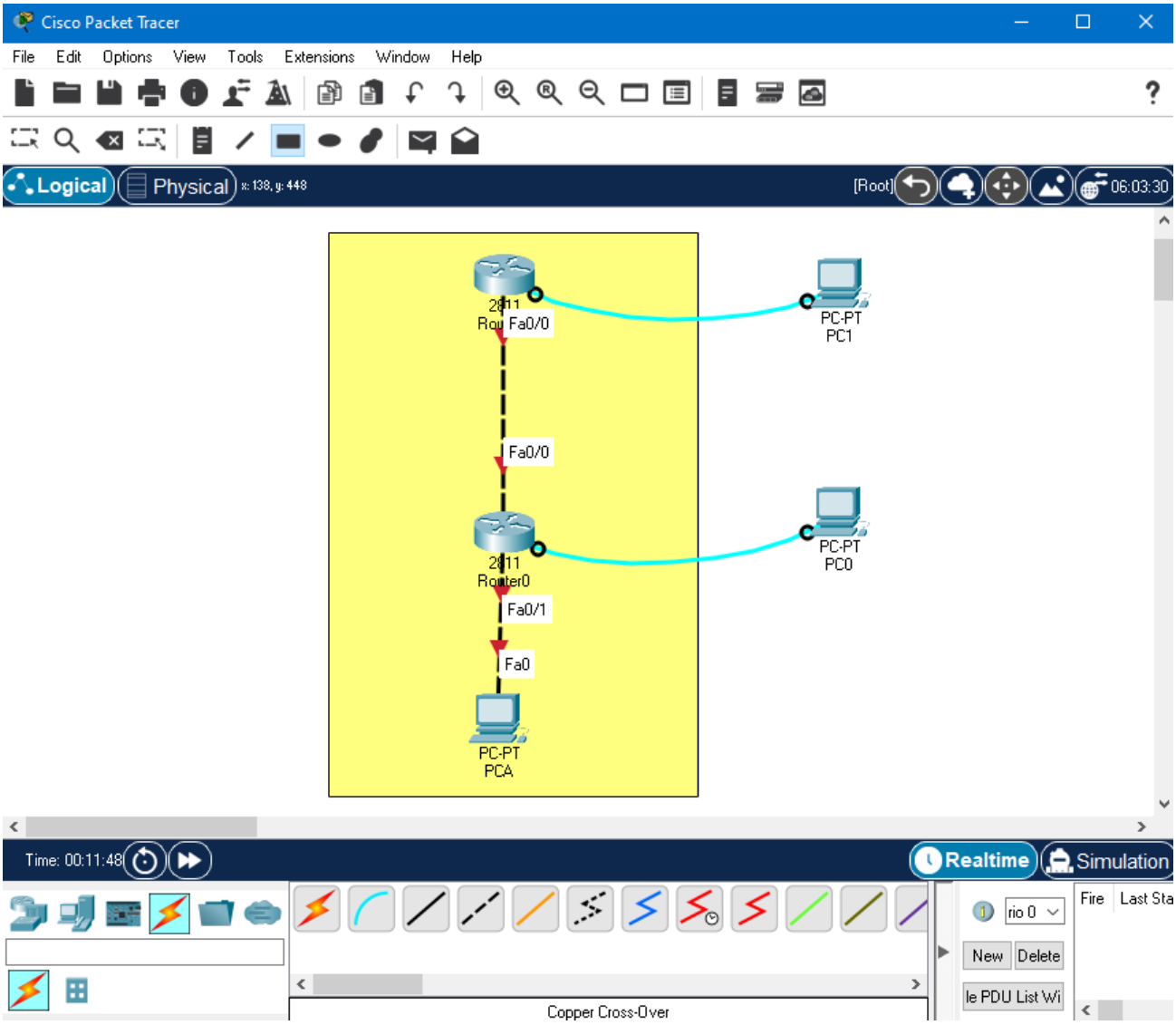

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 138, y: 448
[Root]
06:03:30
2811
Rou
Fa0/0
PC-PT
PC1
Fa0/0
2811
Router0
PC-PT
PC0
Fa0/1
Fa0
PC-PT
PCA
Time: 00:11:48
Realtime
Simulation
rio 0
New
Delete
Fire
Last Sta
le PDU List Wi
Copper Cross-Over

Figure 9

Press PC0 icon and press “Desktop” tab and press “OK” to enter CLI of Router 0.

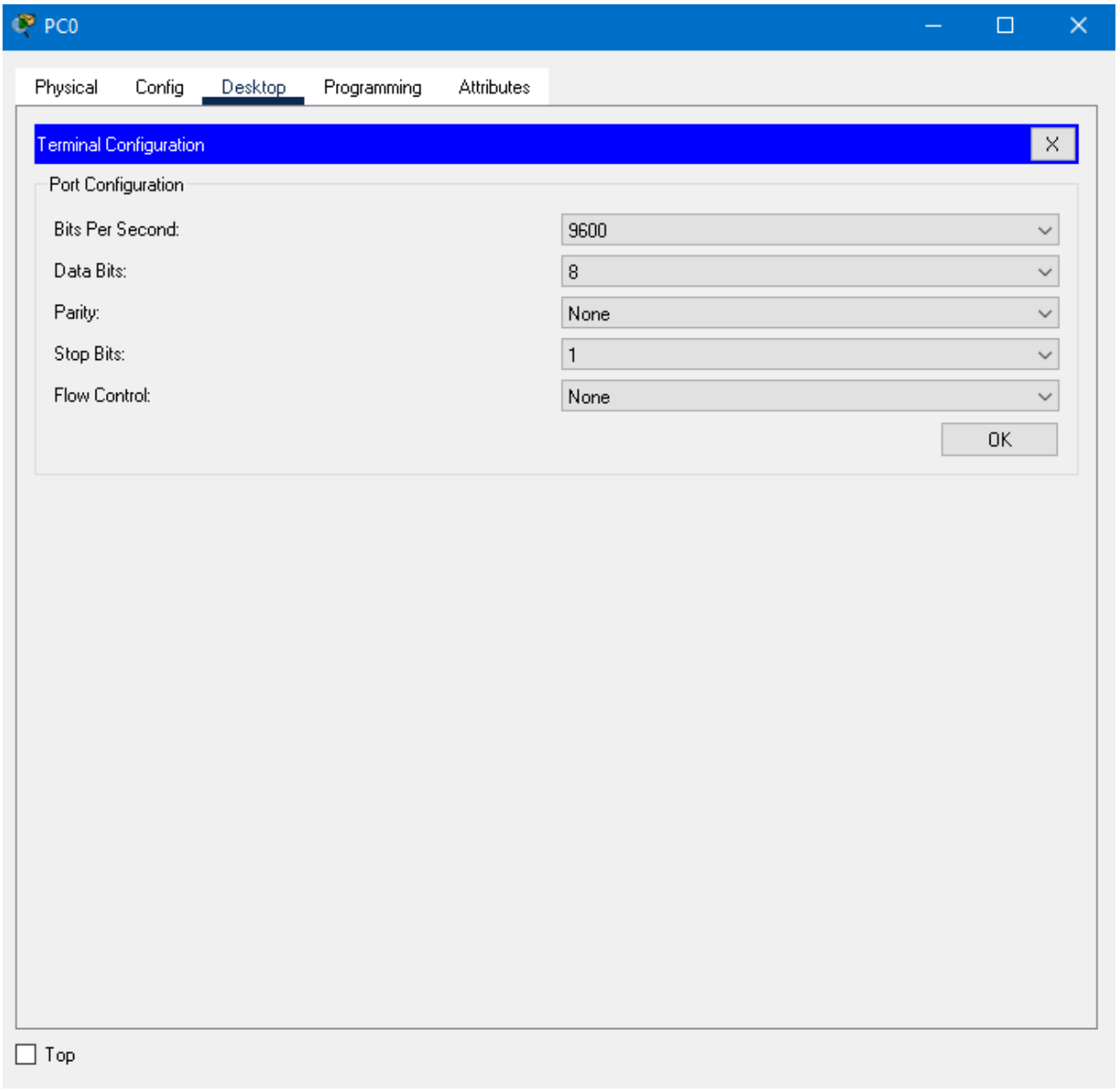


Figure 10

Do the configurations for Router 0 as shown in Figure 11.

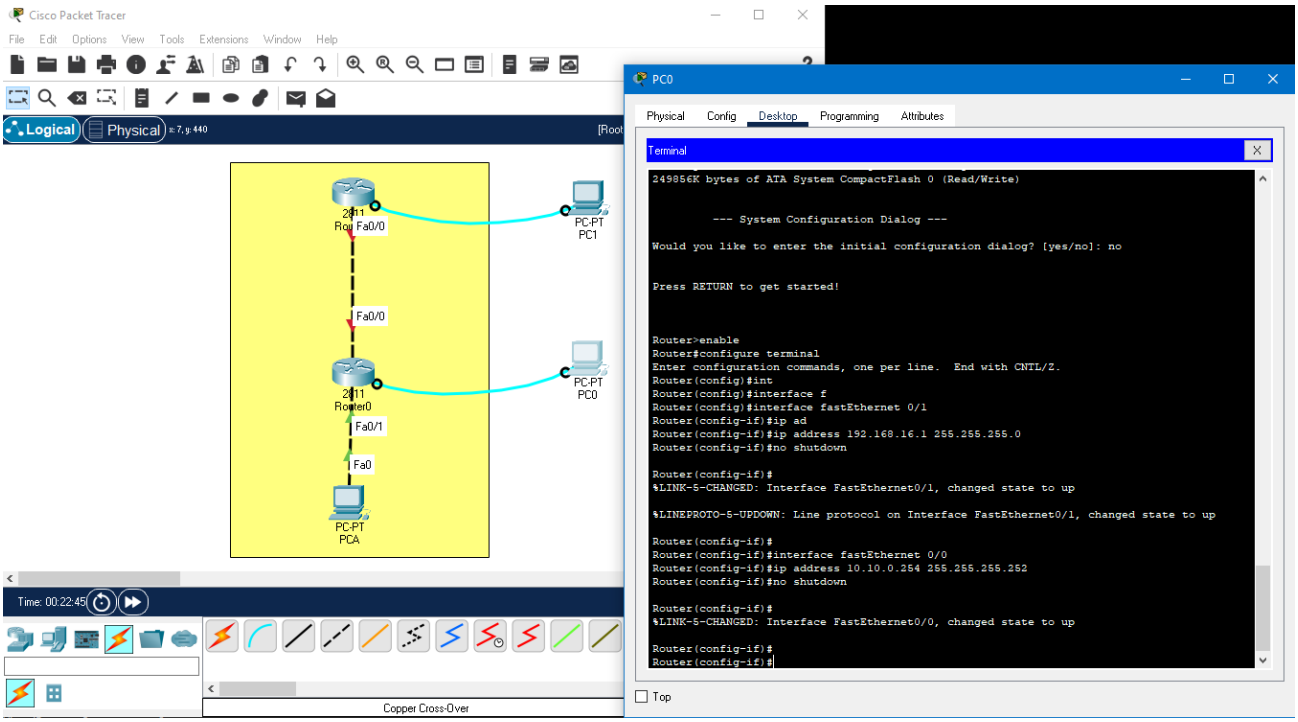


Figure 11

Press PC1 icon and press “Desktop” tab and press “OK” to enter CLI of Router 1 and do the configurations for Router 1 as shown in Figure 12.

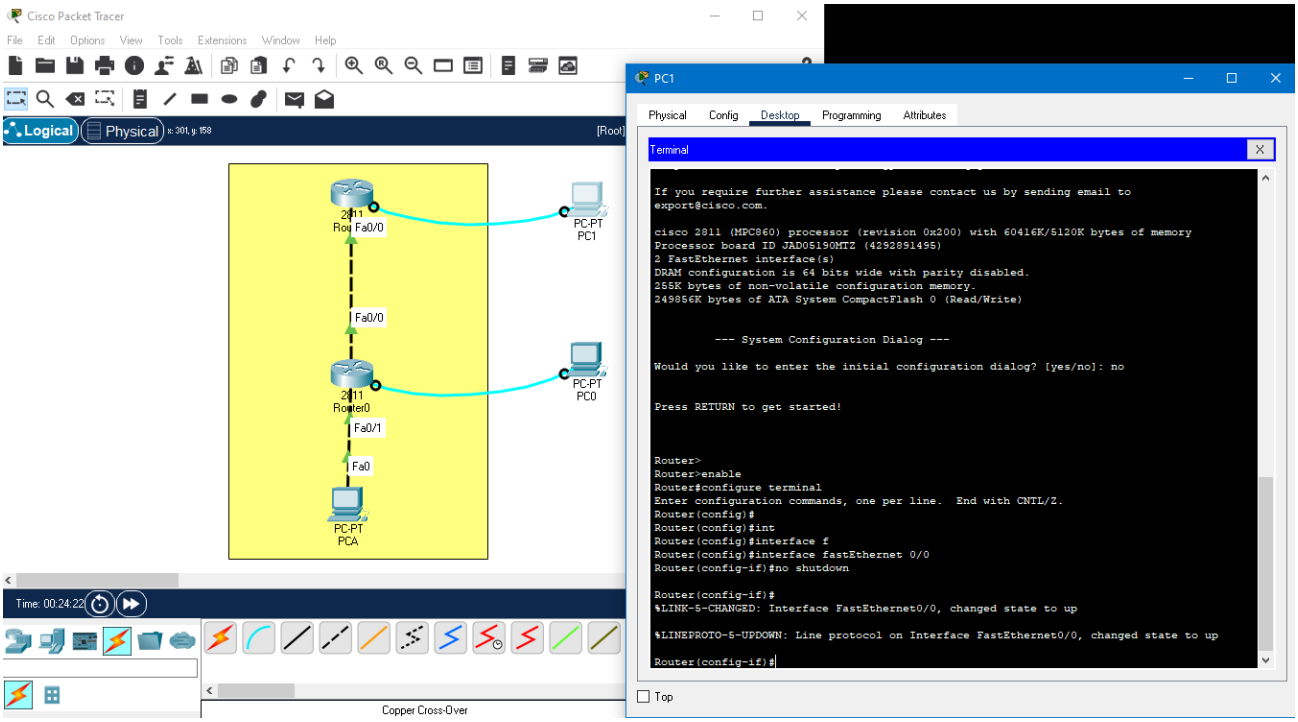


Figure 12

Press PCA icon and select Desktop tab. Select “IP Configuration” as shown inn figure 13.

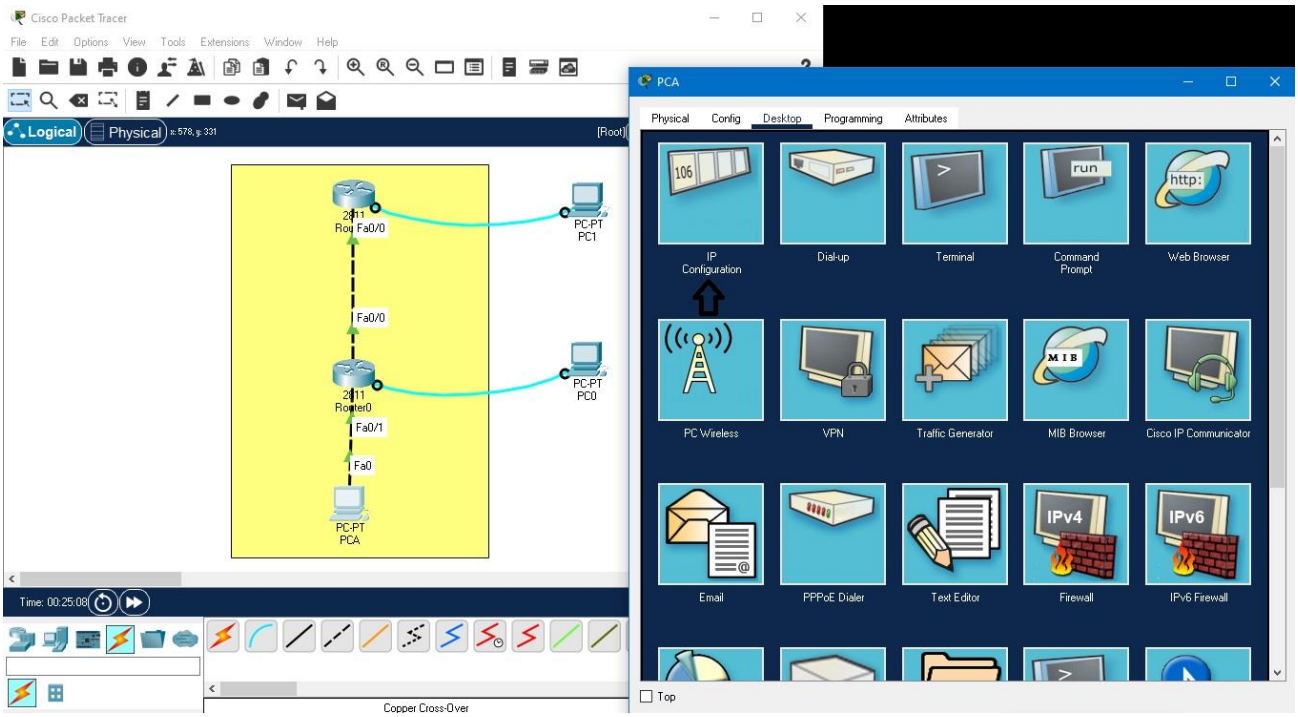


Figure 13

Enter IP address, Subnet Mask and Default Gateway for PCA as shown in Figure 14

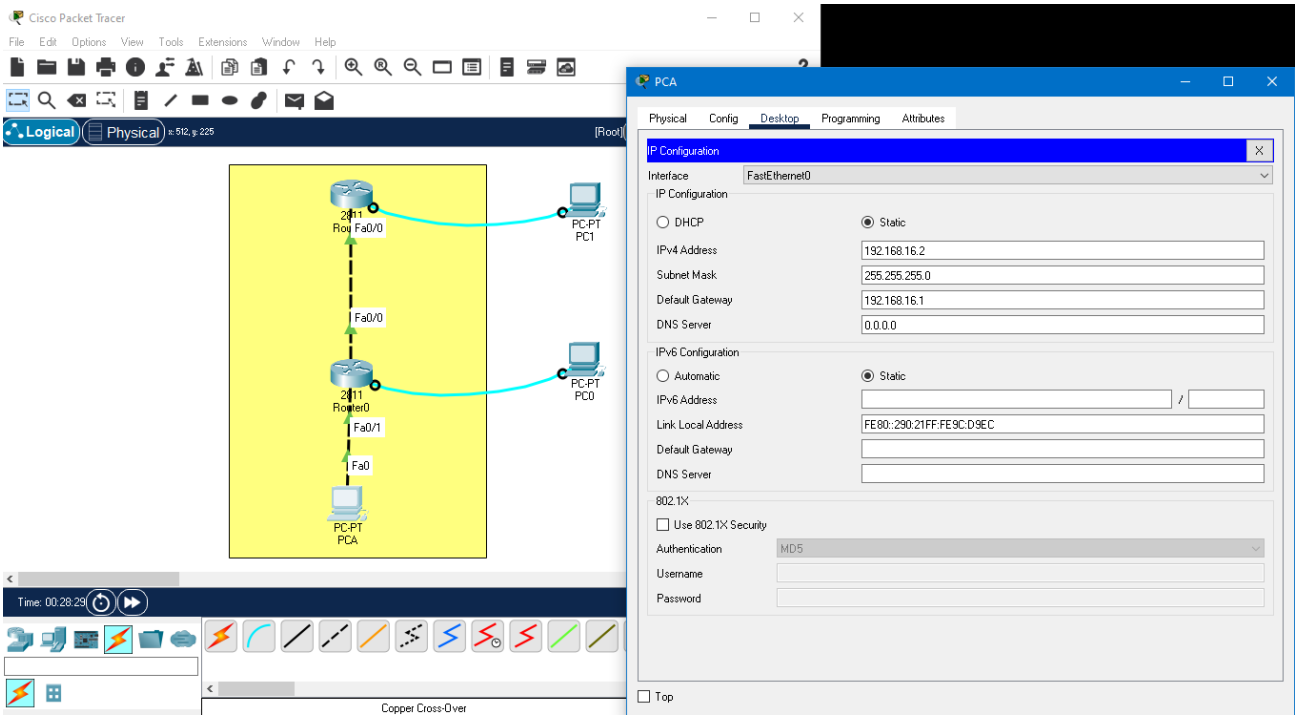


Figure 14

Label the network with all the IP address and subnet Masks given to each device as shown inn Figure 15.

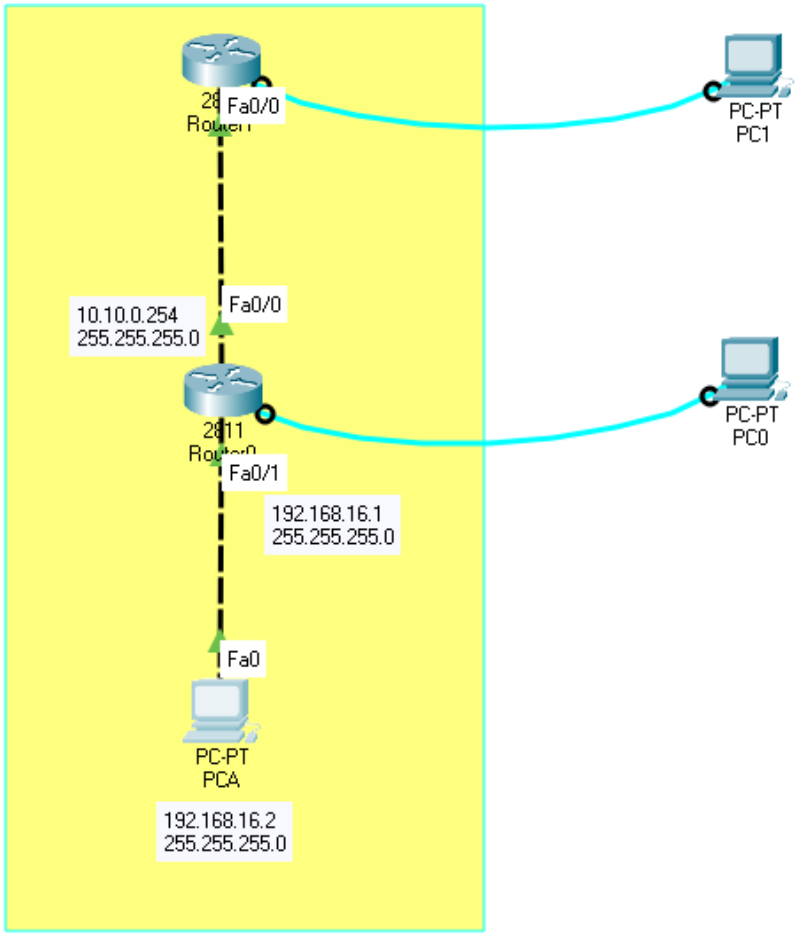


Figure 15

Ping the IP address configured for PCA from Router 0 (CLI). You should be in the Privileged mode to ping.

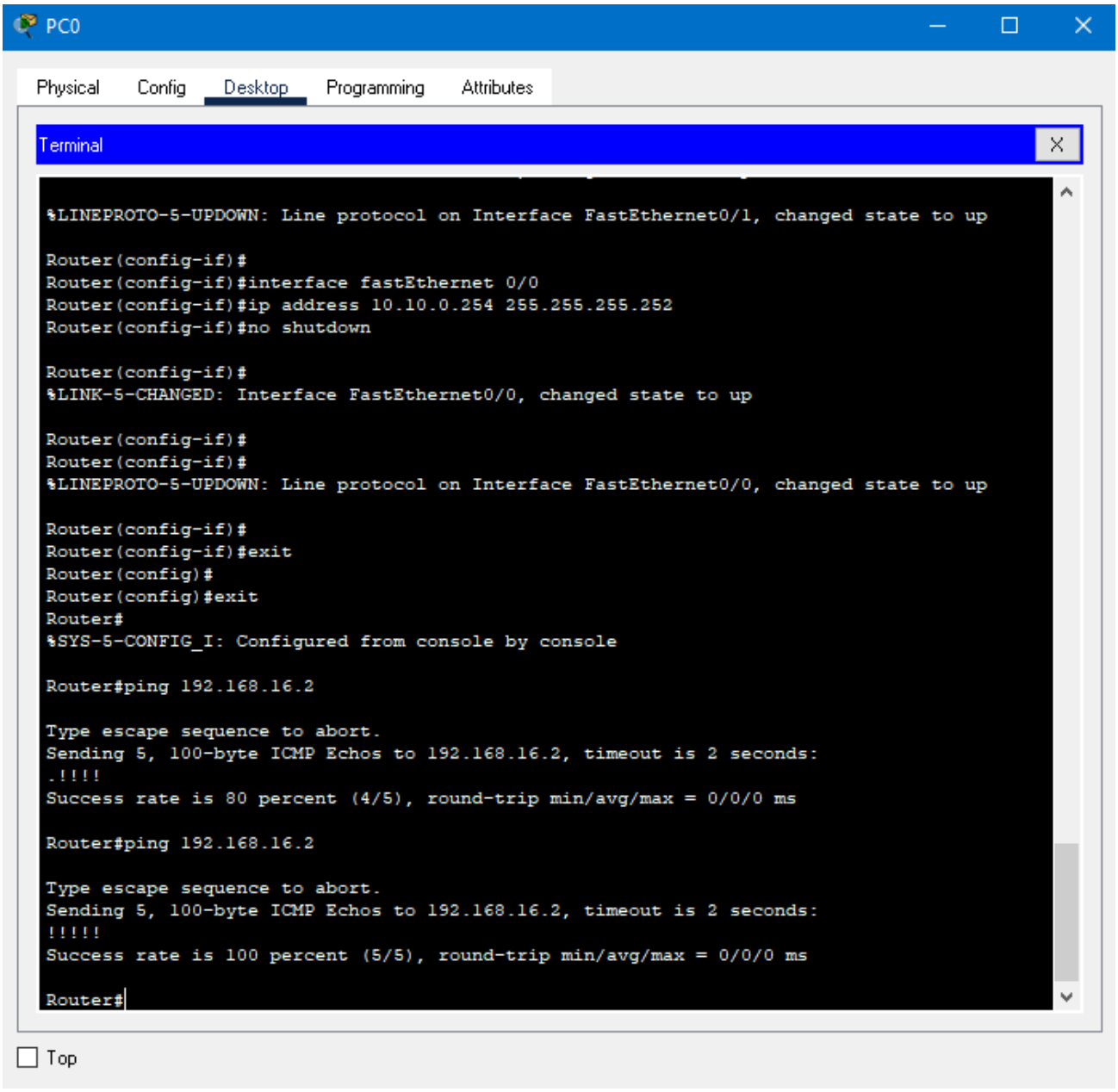


Figure 16

Ping the IP address configured for Fa0/0 in Router A from PCA. Press Desktop Tab and select Command Prompt.

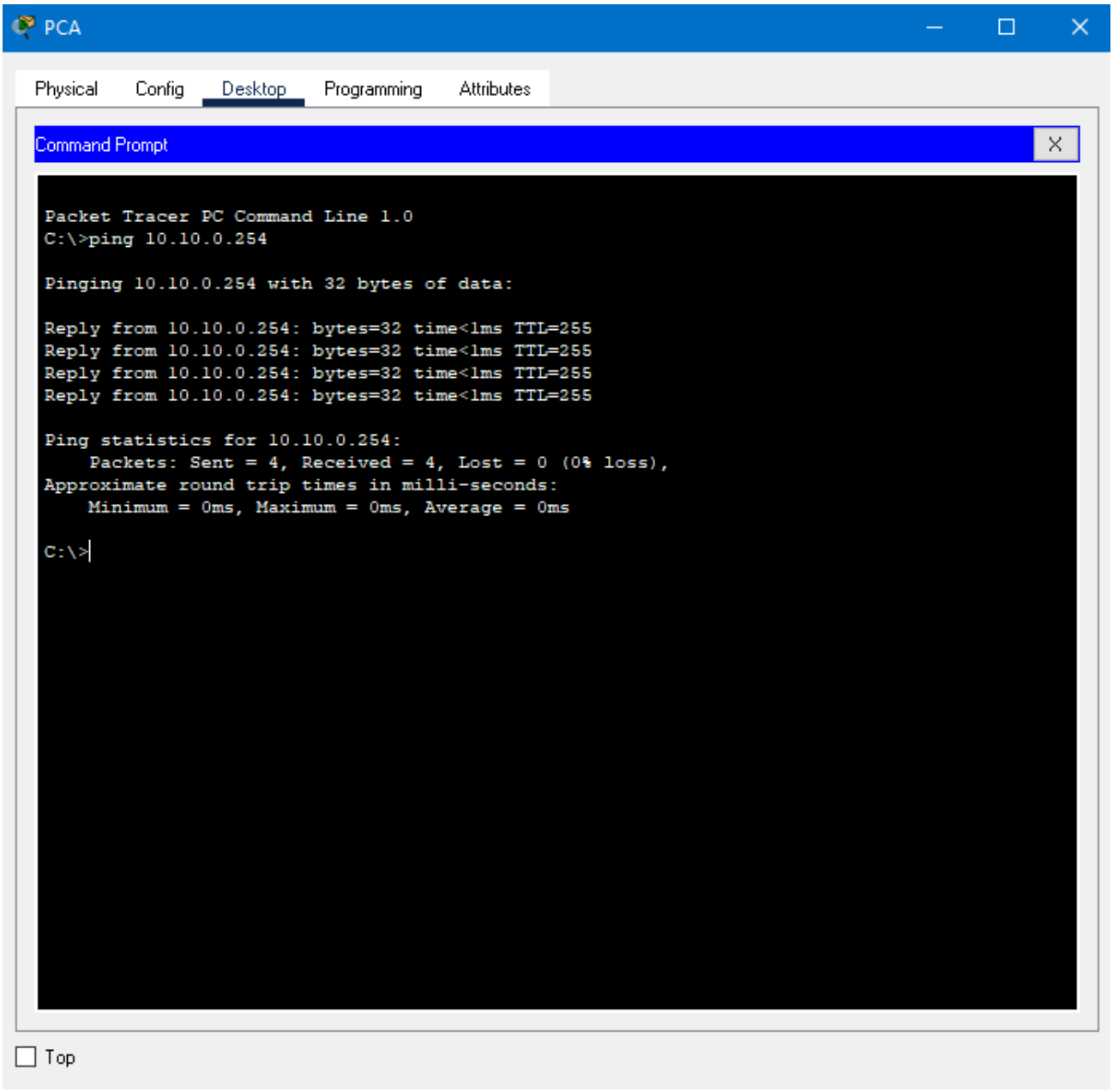


Figure 17