

## Lab-1: Cisco Packet Tracer

### 1. Outcomes: After this lab, learner able to:

- 1.1. Install and config Packet tracer (Latest Version)
- 1.2. Use packet tracer to the Network subject

### 2. Prepare:

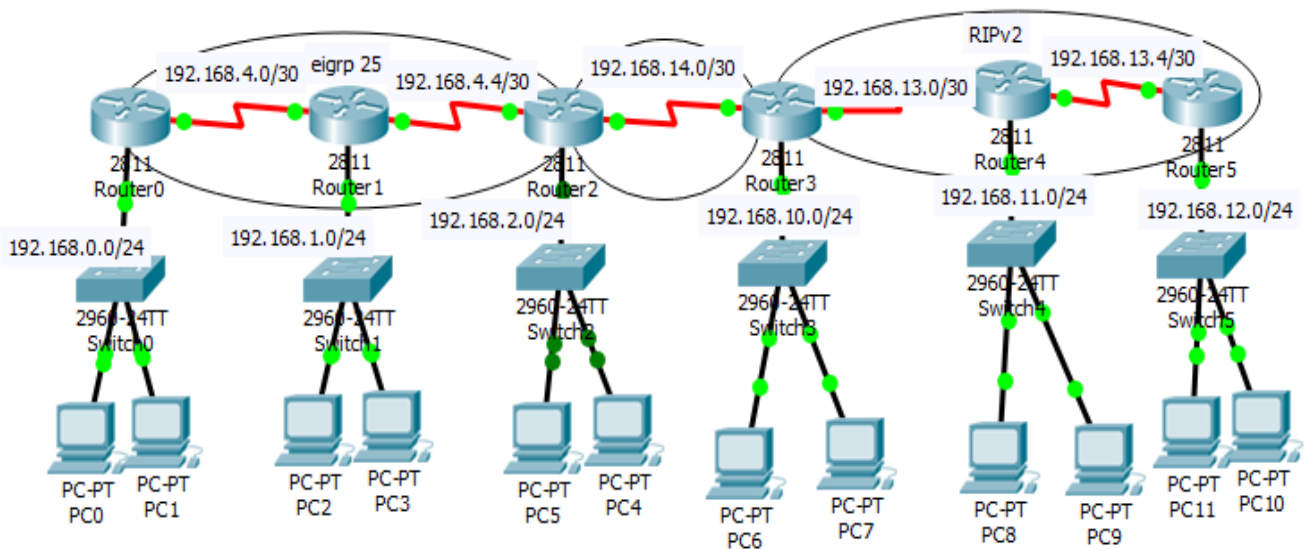
- 2.1. Download packet tracer 7.3.1 (or later)
- 2.2. Read most common commands linux

### 3. Facilities

- 3.1. Computer

### 4. Duration: 4 hours

### 5. Welcome to Packet Tracer



First, let's understand what network simulation software is. According to the Cambridge dictionary, the meaning of simulation is that: *Simulation (n):*

*a model of a set of problems or events that can be used to teach someone how to do something, or the process of making such a model*

We conclude that network simulation software is a type of software that simulates the operation of networking devices. Which is suitable for students and people interested in networking We'll take advantage of this kind of software to study and configure the devices to perform the tasks we set.

So why don't we really study from network devices? That is because these types of equipment are expensive. Making many people unable to own it Or even the educational institution itself Cannot provide this type of equipment for students to use in learning and teaching thoroughly We will have to rely on software to simulate network devices instead.

Therefore, Cisco Packet Tracer software has been selected to introduce you to how to install and use it. Because it is easy to use and most importantly, "free".

### 5.1.Download

- Website. <https://www.netacad.com/courses/packet-tracer>
- Click the Enroll to download Packet Tracer button to register.

## How to download Packet Tracer

To download Packet Tracer, follow these steps to create your Networking Academy registration:

- Click the 'Enroll to Download Packet Tracer' button
- Enroll in the Introduction to Packet Tracer course
- Complete your Networking Academy registration
- Launch the Introduction to Packet Tracer course
- Download instructions are found within the course

Enroll to download Packet Tracer

### 5.2.Click the Sign up today!

Enroll, download and start learning valuable tips and best practices for using Cisco's innovative simulation tool, Packet Tracer. This self-paced course is designed for beginners with no prior networking knowledge. It teaches basic operations of the tool with multiple hands-on activities helping you to visualize a network using everyday examples, including Internet of Things (IoT). Introductory course is extremely helpful for anyone who plans to take one of the Networking Academy courses which utilizes the powerful simulation tool.

Sign up today!

Sign up today!

### 5.3. Complete all information and click on the Submit button to continue.

# Enroll now

First Name \*

Last Name \*

Email \*

protected by reCAPTCHA  
Privacy - Terms



Submit

## 5.4. Let us check the email used to register to Activate account.

 Cisco Networking Academy

Dear [REDACTED],

Welcome to Cisco Networking Academy! To activate your account, please click the button below:

Activate account >>

TIPS:

- Your NetAcad ID is [REDACTED]. Keep this handy in case you ever need support.
- This link is valid for a limited time. If this link is expired, please go to <https://www.netacad.com> and click on Log In/Resend Activation Email to get a new link.
- The create account screen accepts names in English characters only. For your convenience, we have auto-translated your first name and last name. You can correct the translation if needed.
- If you do not see a button, please copy the following link and paste into your browser:  
[https://www.netacad.com/portal/saml\\_login](https://www.netacad.com/portal/saml_login)
- If you already have an account, go to <https://www.netacad.com> and click Log In to access your courses.

Whether you've always been passionate about technology or just discovered IT, there has never been a better time to get started.

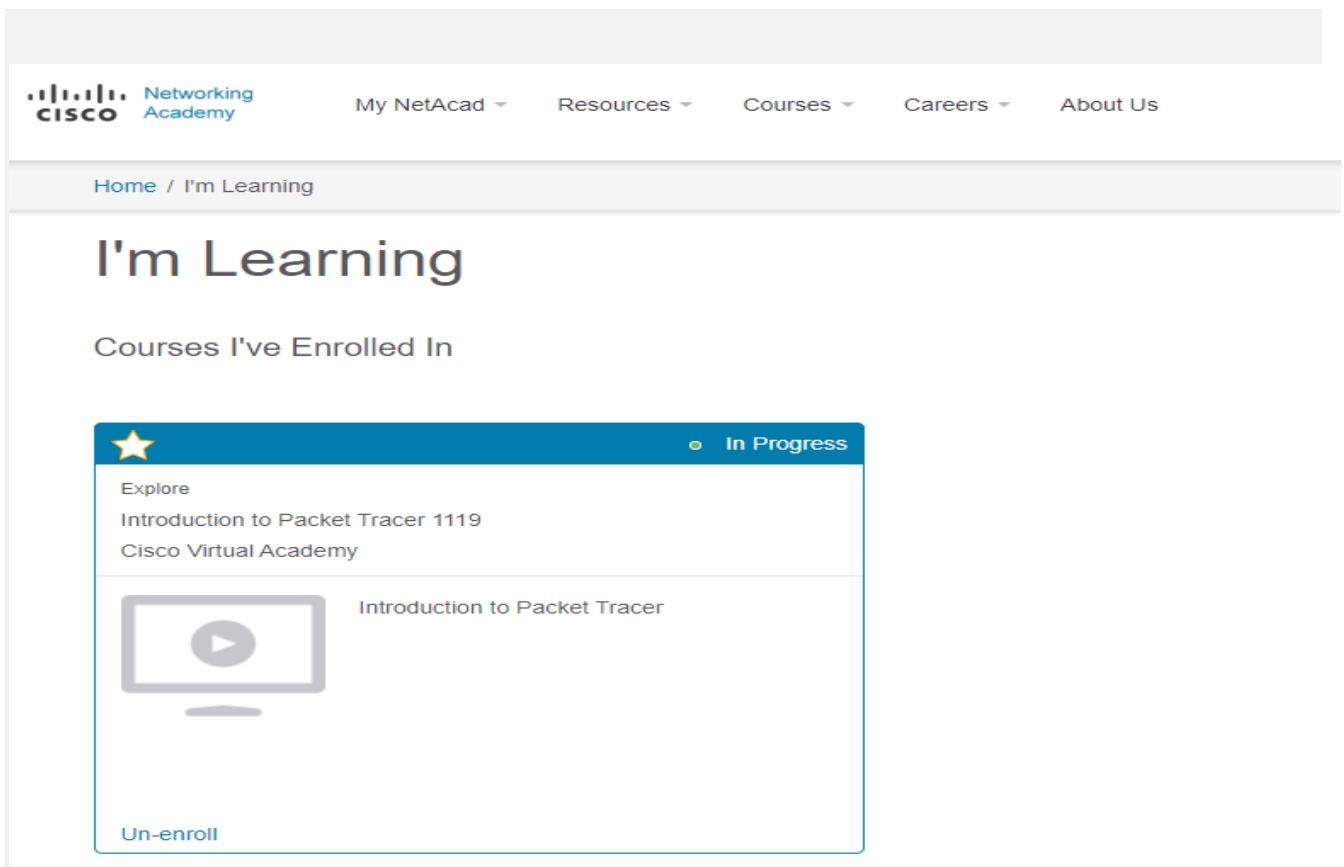
Sincerely,  
Cisco Networking Academy Team  
<https://www.netacad.com>

## 5.5. Login with Cisco Account if you have not signed up.

Apply from this link [https://identity.cisco.com/ui/tenants/global/v1.0/enrollment-ui?ui\\_locale=en\\_TH](https://identity.cisco.com/ui/tenants/global/v1.0/enrollment-ui?ui_locale=en_TH)



5.6. When login is successful, will go to the website as in the picture



5.7. Select the menu Resource -> Download Packet Tracer, then download it according to your operating system. Here is an example for Windows.

## Download

Choose the OS you are using and download the relevant files. Read the [FAQ](#). View [Tutorials](#).

Packet Tracer requires authentication with your login and password when you first use it and for each new OS login session. (1)

### Windows Desktop Version 7.2.2 English

[64 Bit Download](#)

[32 Bit Download](#)

### Linux Desktop Version 7.2.2 English

[64 Bit Download](#)

### macOS Version 7.2.2 English

[Download](#)

### Mobile

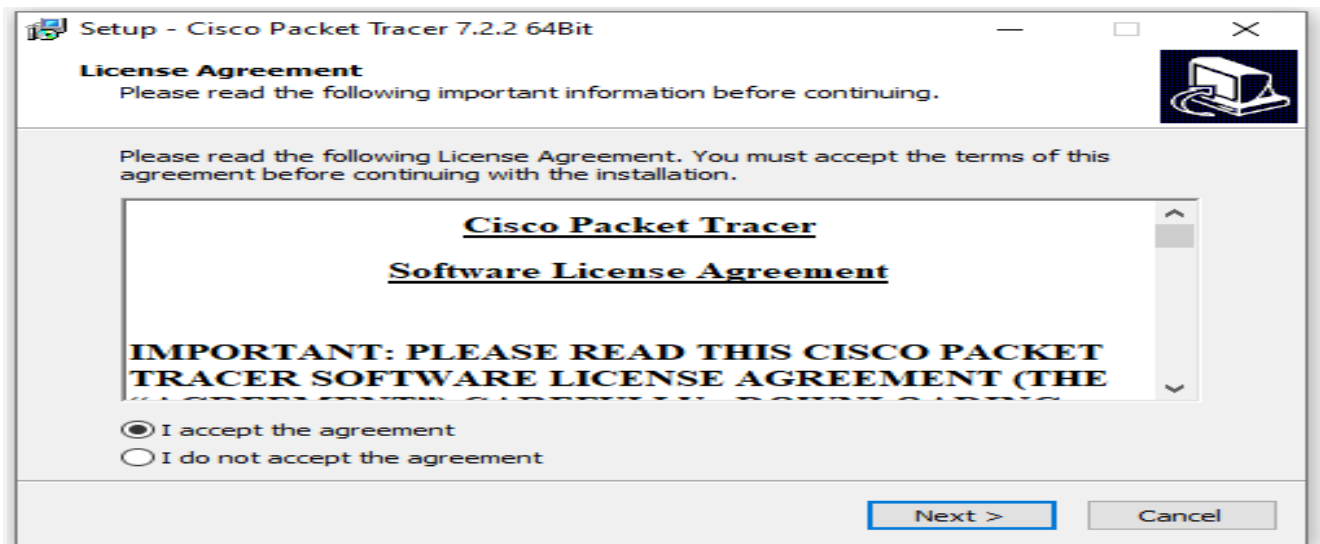
[iOS Version 3.0 English](#)



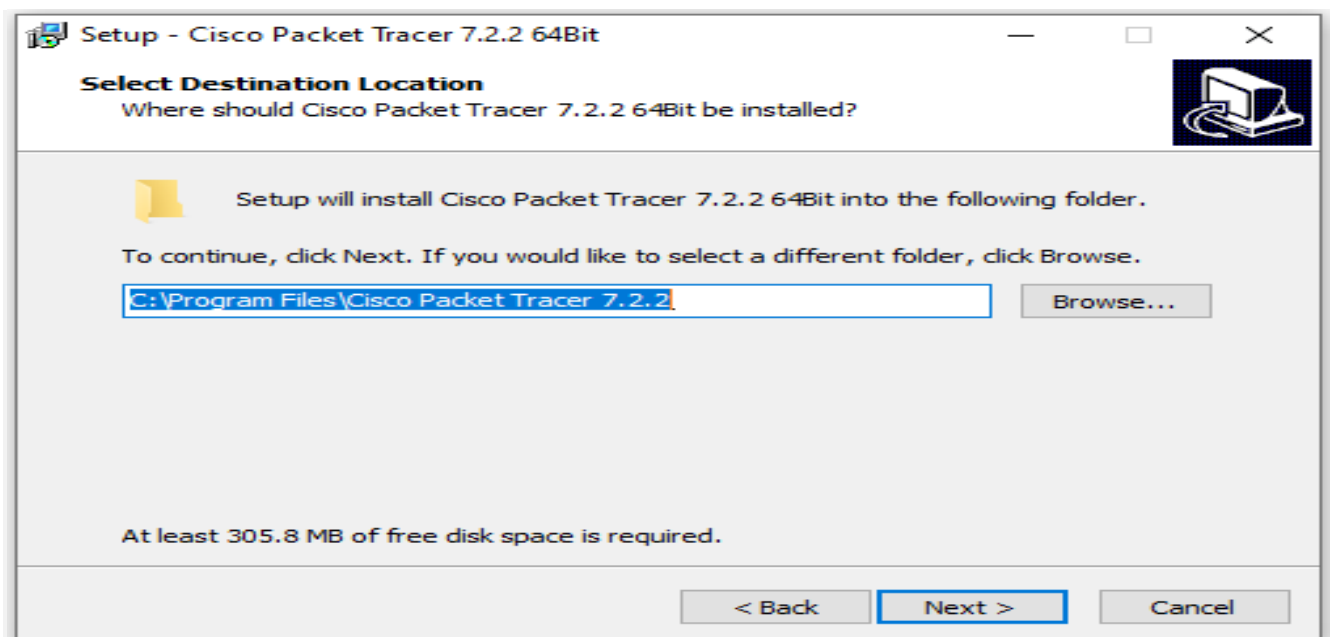
[Android Version 3.0 English](#)



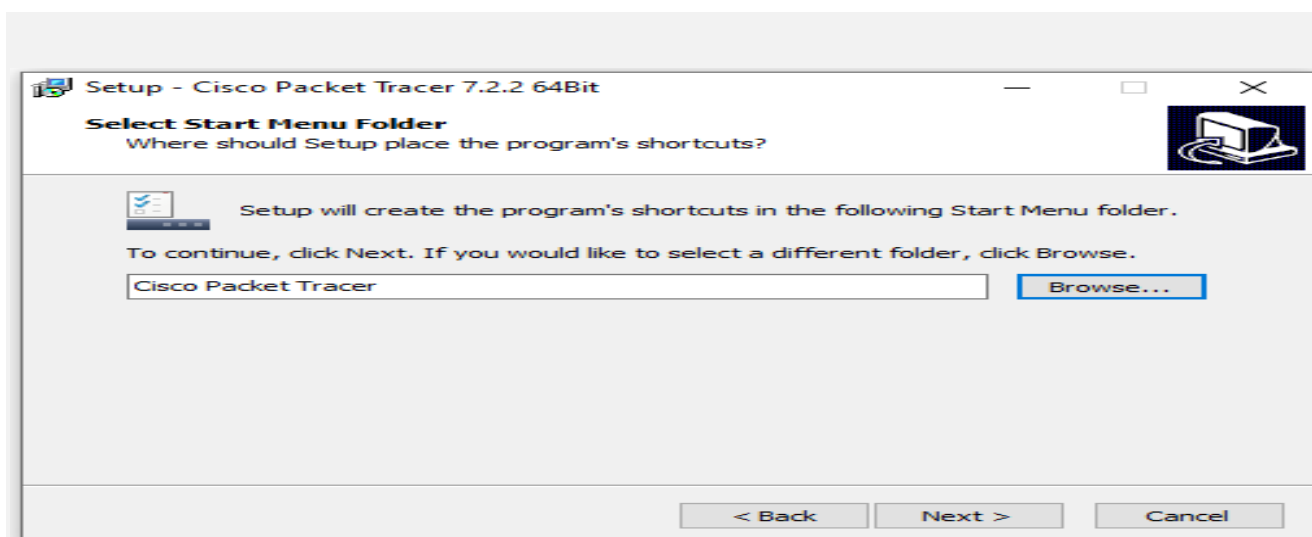
- 5.8. Once the download is complete, please double-click the file. PacketTracer-7.2.2-win64-setup To install, then select I accept the agreement and click Next.



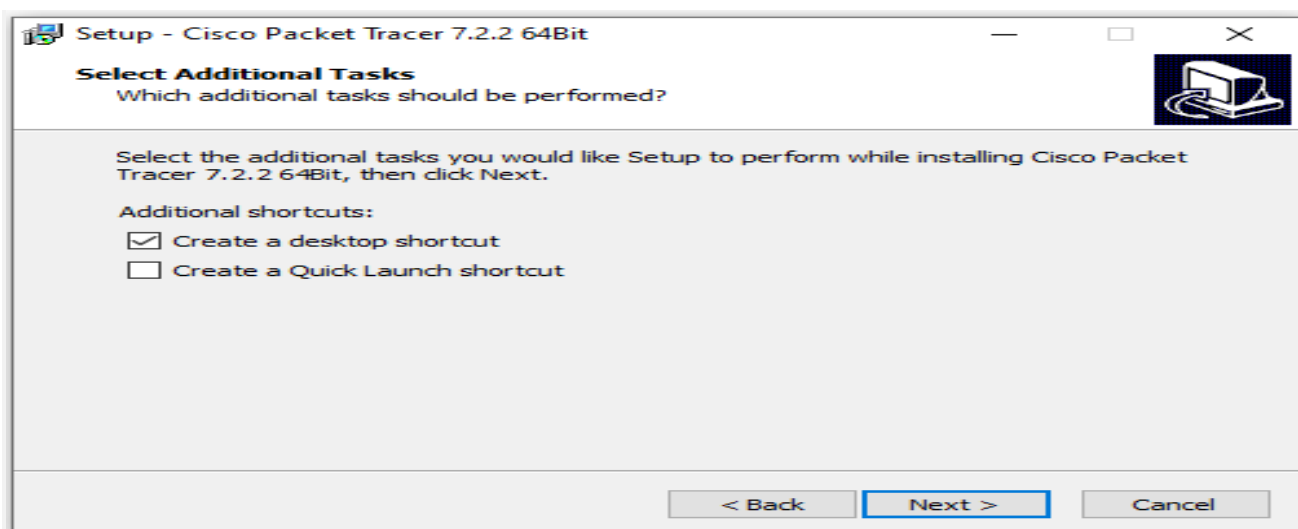
- 5.9. Select the software installation location and click Next.



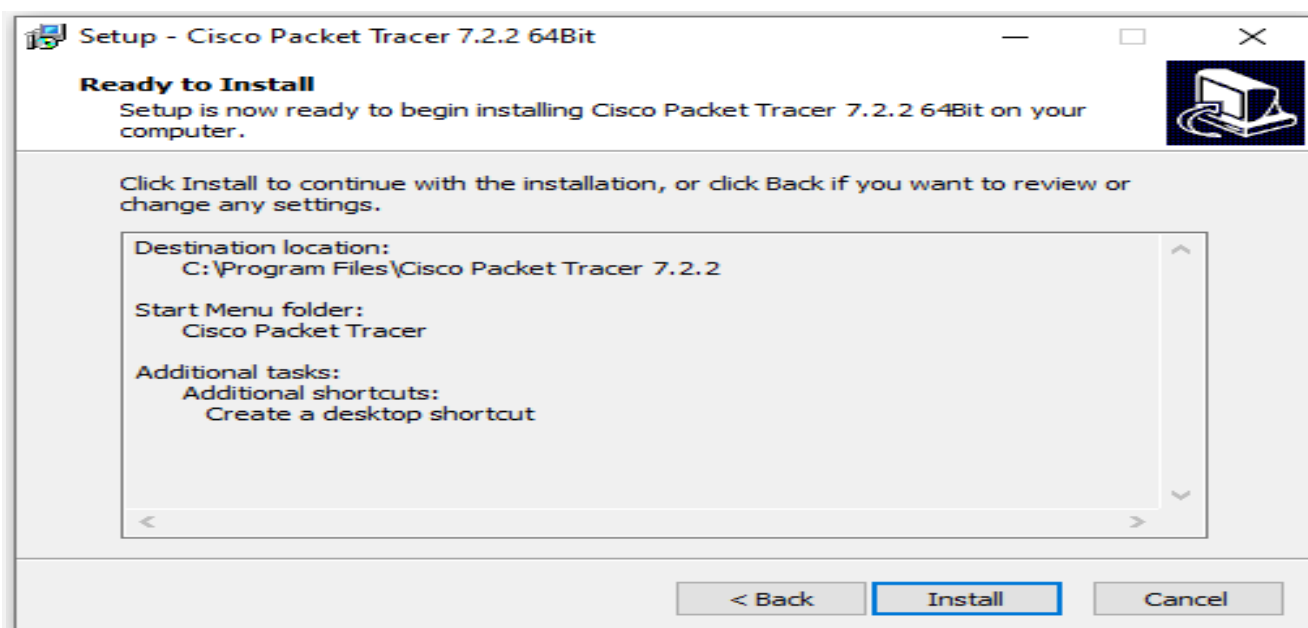
5.10. Choose a location to save the shortcuts of the software and click Next.



5.11. Choose which parts of the shortcuts will be installed and click Next.

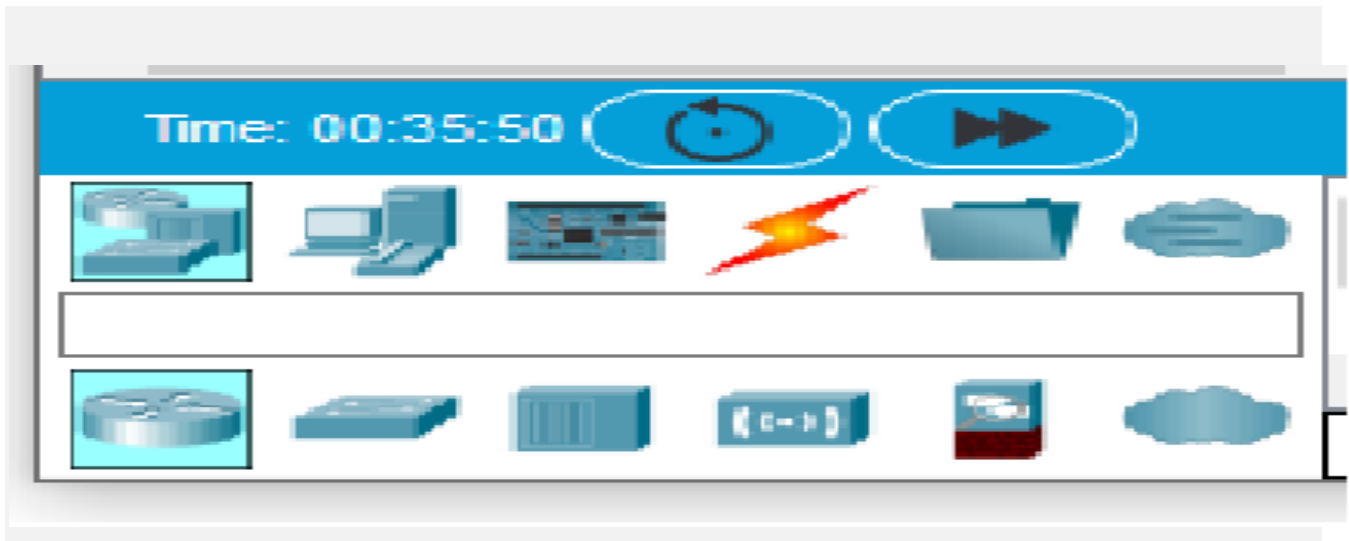


5.12. Click Install.



## 6. Introduction to the user interface of the software

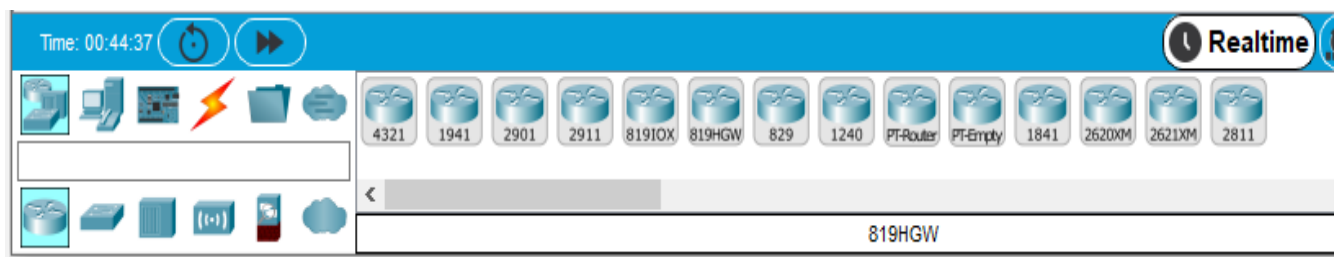
6.1. For now, it will be an introduction to the user interface of the software. Starting with the first part, it will be a group of devices that can be selected.



The top row is a group of devices. From left to right:

Network Device The Network Device group contains a list of devices (bottom row).

1.1 Routers will be available in various models as shown in the figure.



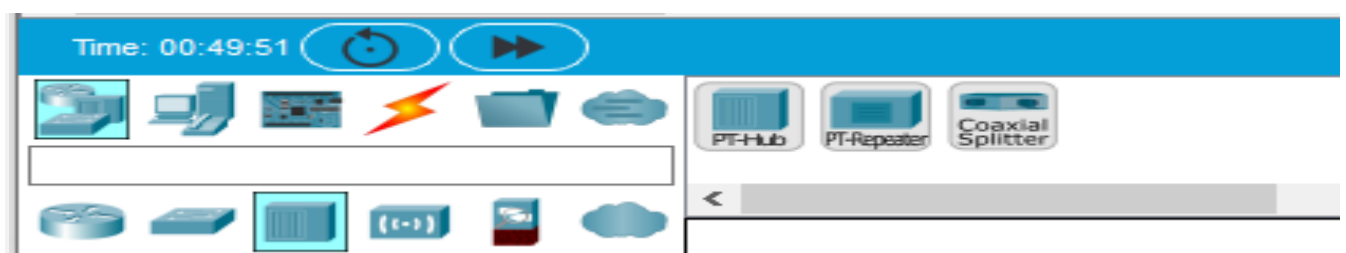
Models of Routers that can be selected for use

1.2 Switches are available in various models as shown in the figure.



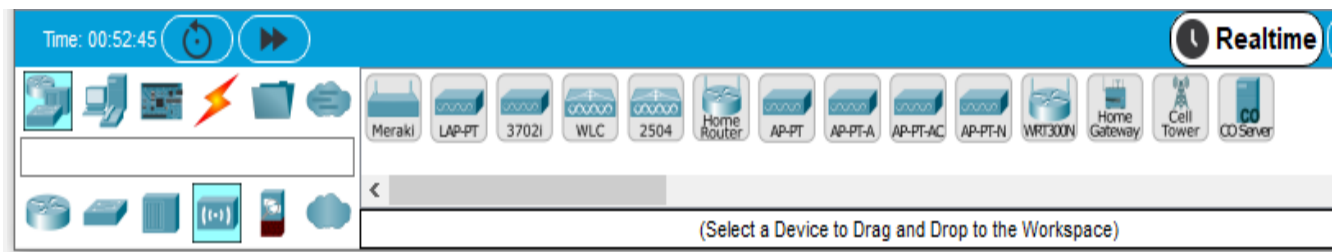
Switches that can be used

1.3 Hubs will be available as shown in the picture.



Models of Hubs that can be selected for use

1.4 Wireless Devices will be available in various models as shown.



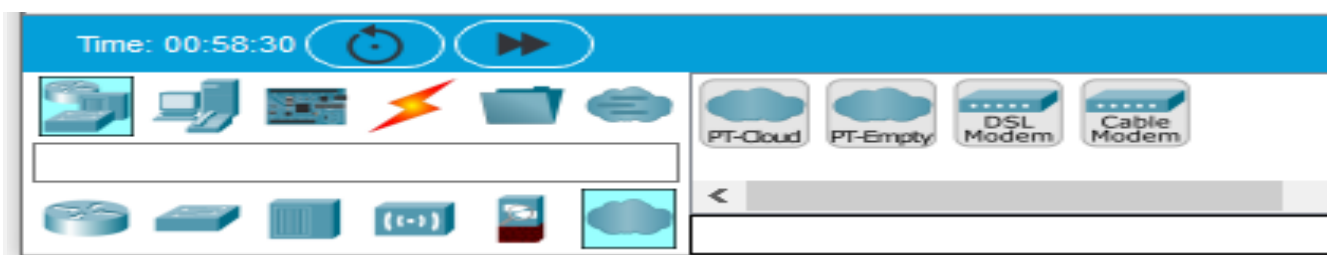
Wireless Devices models that can be selected for use

1.5 Security will be available as in the picture.



Security models that can be used

1.6 WAN Emulation will be available as shown in the picture.



WAN Emulation that can be used

2.End Devices There are many types of End Devices group. It consists of the following equipment items (bottom row)

2.1 End Devices equipped PC, Laptop, Server, IP Phone , Printer, Tablet , etc.

2.2 Home equipped. AC, Battery, Bluetooth speaker, Ceiling Fan, Door etc.

2.3 Smart City consists of ATM Pressure Monitor, Power Meter, Solar Panel, Street Lamp, etc.

2.4 Industrial consists of Fire Monitor, Fire Sprinkler, Humidifier, Signal Generator, Thermostat etc.

2.5 Power Grid. Consists of equipment Battery, Blower, Power Meter, Solar Panel, Wind Detector, Wind Turbine, etc.



3.Components Components group contains a list of devices (bottom row).

3.1 Boards consist of MCU Board, SBC Board

3.2 Actuators including Air Cooler, Alarm, Ceiling Sprinkler, Dimmable LED, Floor Sprinkler, etc.

3.3 Sensors include Flex Sensor, Humidity Sensor, Humiture Sensor, Membrane Potentiometer, Metal Sensor, Motion Sensor, Photo. Sensor etc.

4.Connections is a set of cables between devices. Consists of the following signal cable types

4.1 Automatically

4.2 Console

4.3 Copper Straight-Through

4.4 Copper Cross-Over

4.5 Fiber

4.6 Phone

4.7 Coaxial

4.8 Serial DCE

4.9 Serial DTE

4.10 Octal

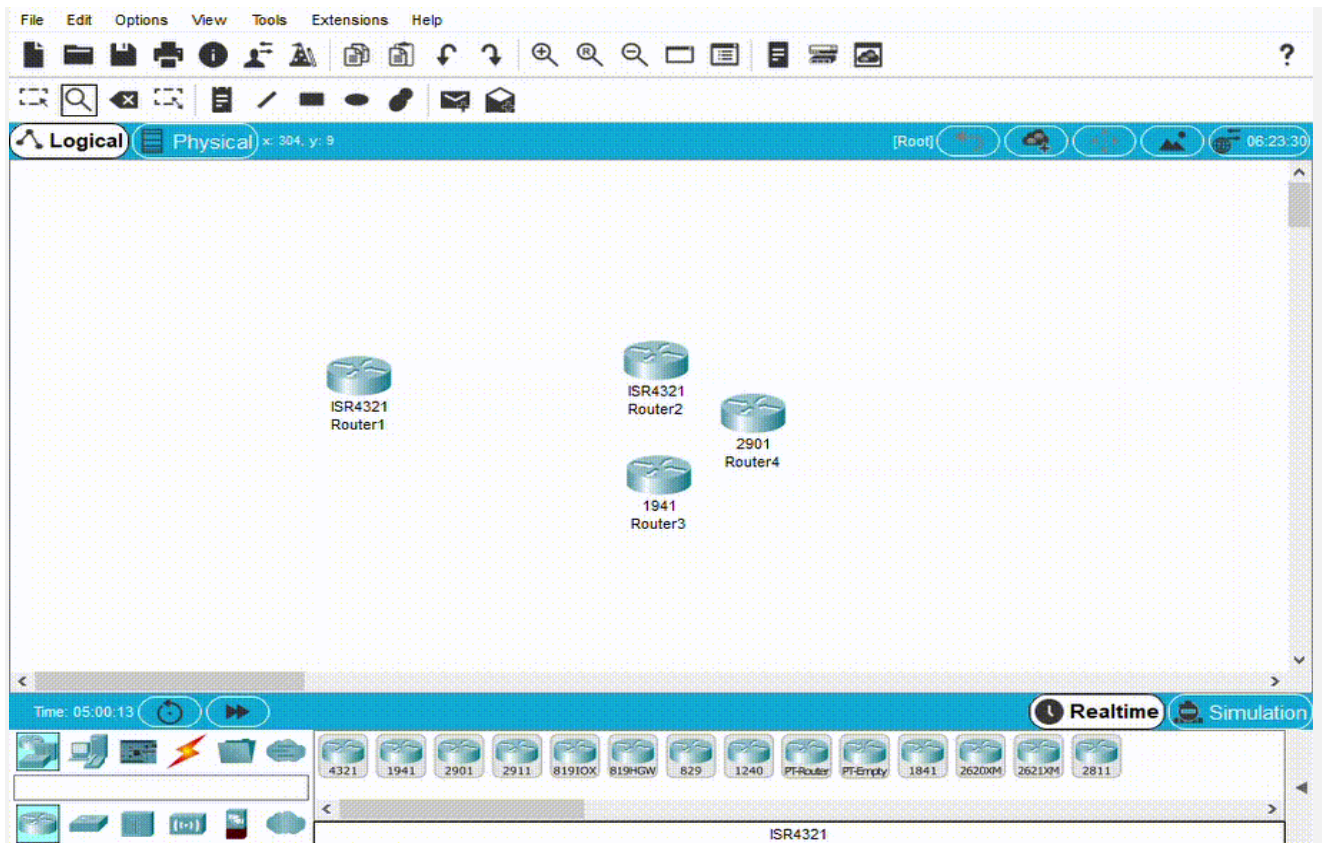
4.11 IoT Custom Cable

4.12 USB

The next part I will introduce is the Common Tools Bar, which will have different tools to be able to use as in the picture.

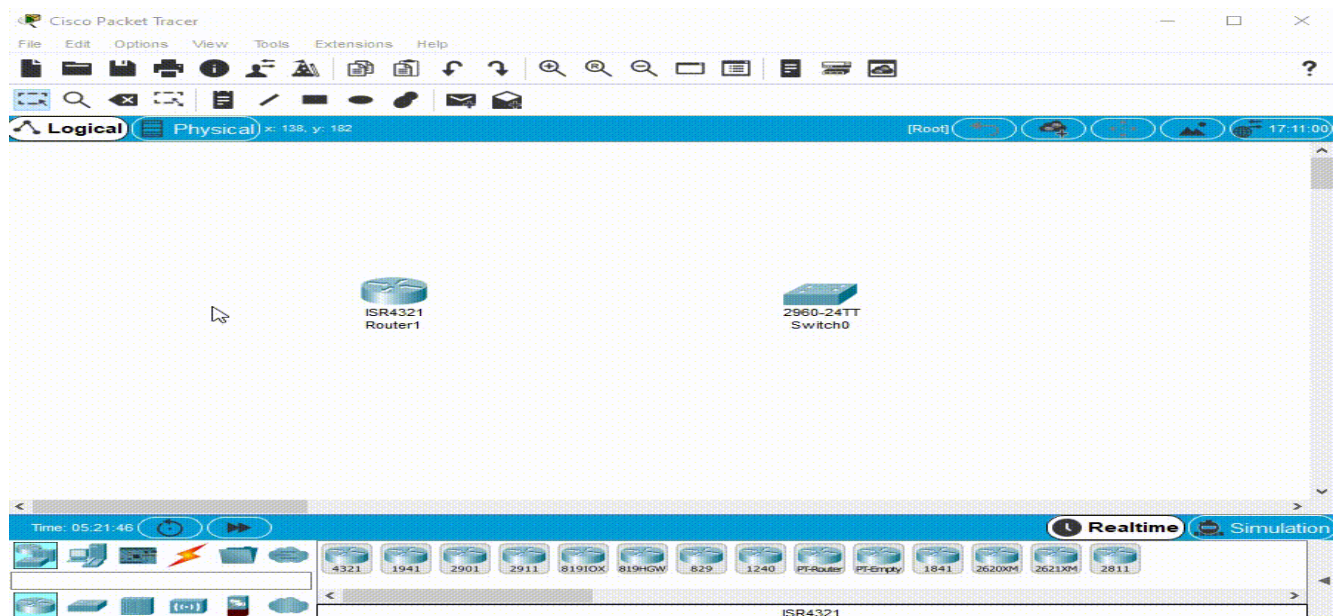


1. Select The shortcut key is ESC, which selects the desired device or group of devices. To use it, left click and hold and drag across the desired device or group of devices.

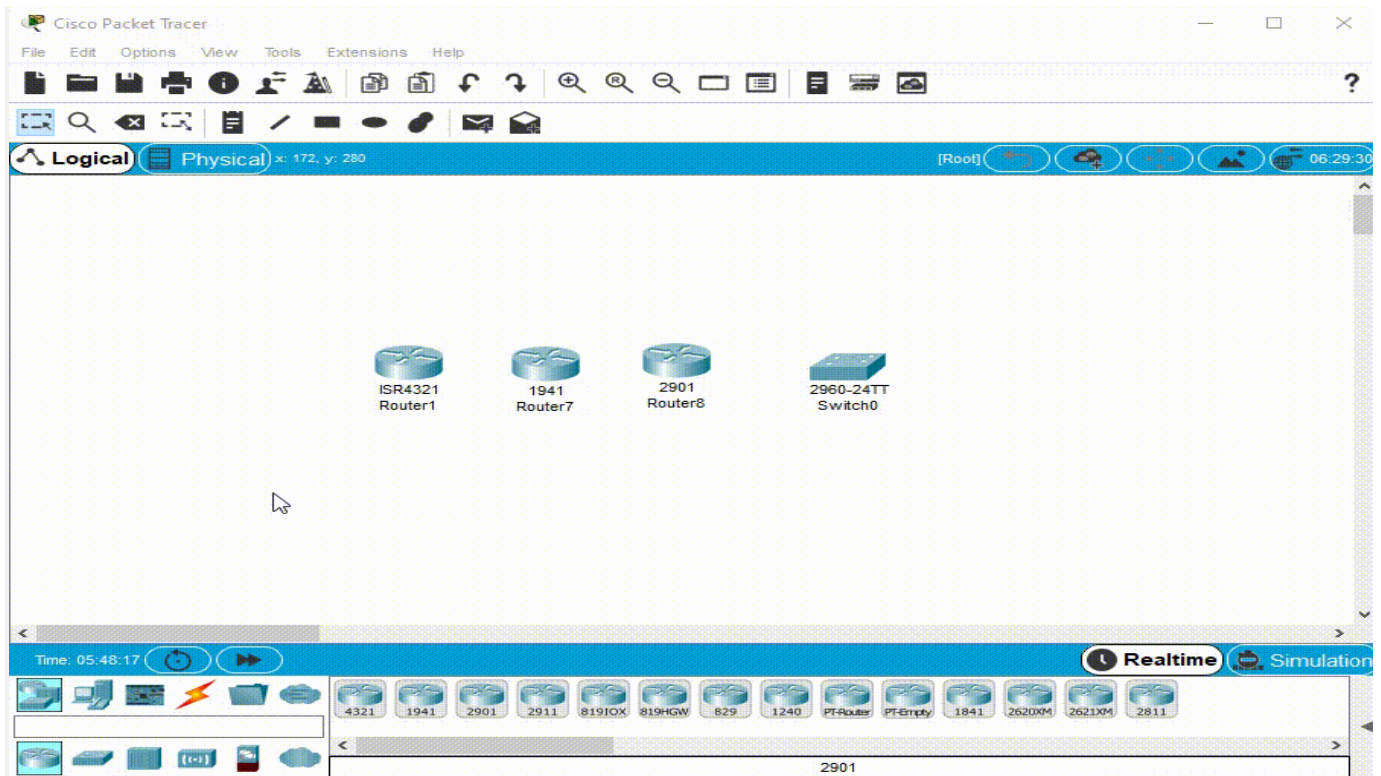


Example of using Select

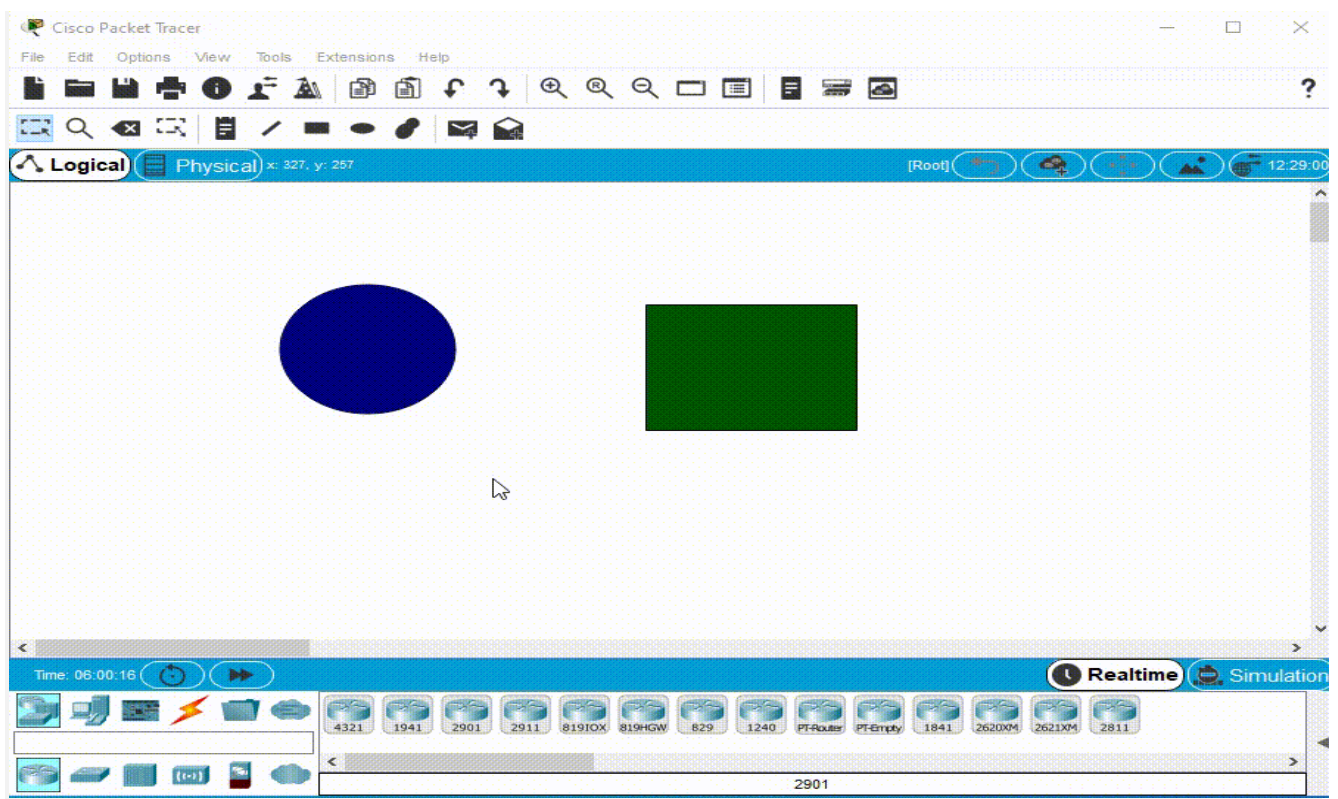
2. Inspect the shortcut button is I to check the operating status of the device quickly. How to use it, click on the device, there will be various menus to choose from depending on the type of device.



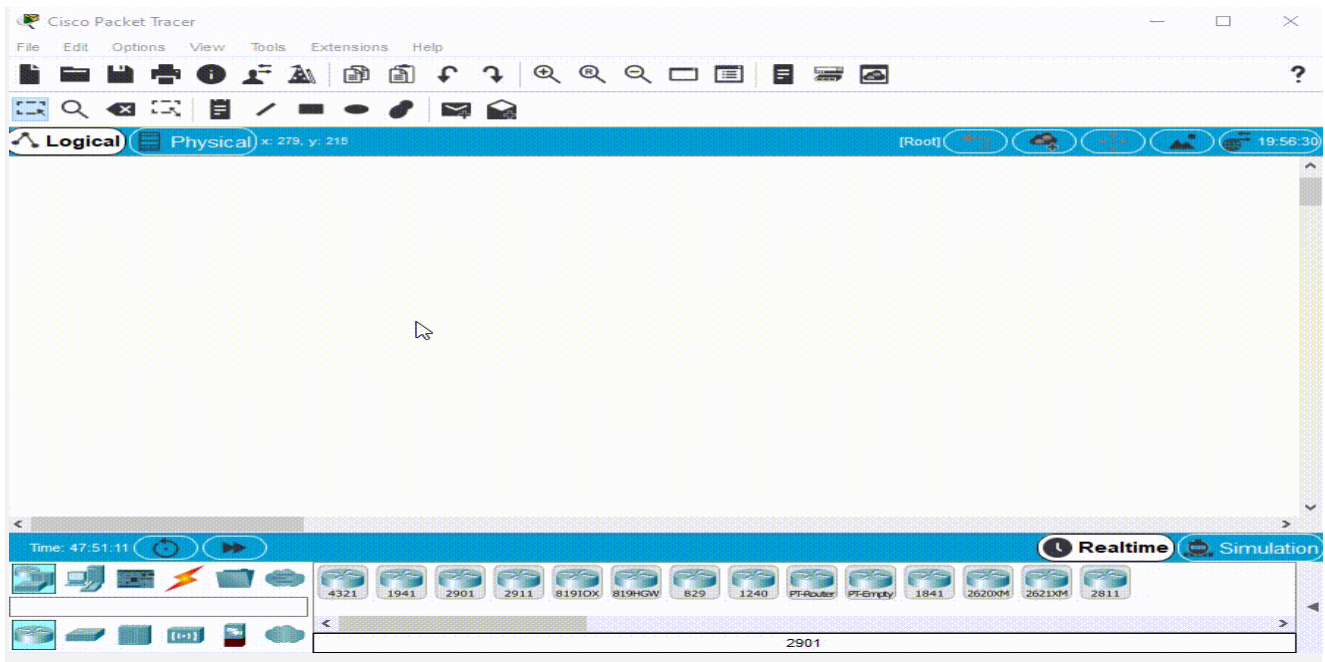
3. Delete shortcut key is Del acts to delete devices that do not want to use. To use, click on the device you want to delete.



4. Resize shortcut key is Alt + R to resize graphics created in Workspace. How to use? Left click and hold the red point to resize graphics.



5. Place Note The shortcut button is N, it acts as a note as we want. How to use it We can type any message we want on Workspace straight away.



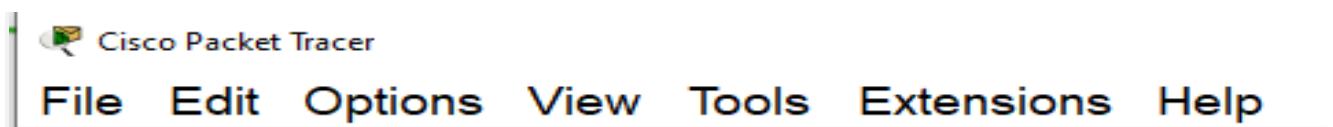
The next part I will introduce is the Main Tool Bar section, which is a part of the commands that are often used.



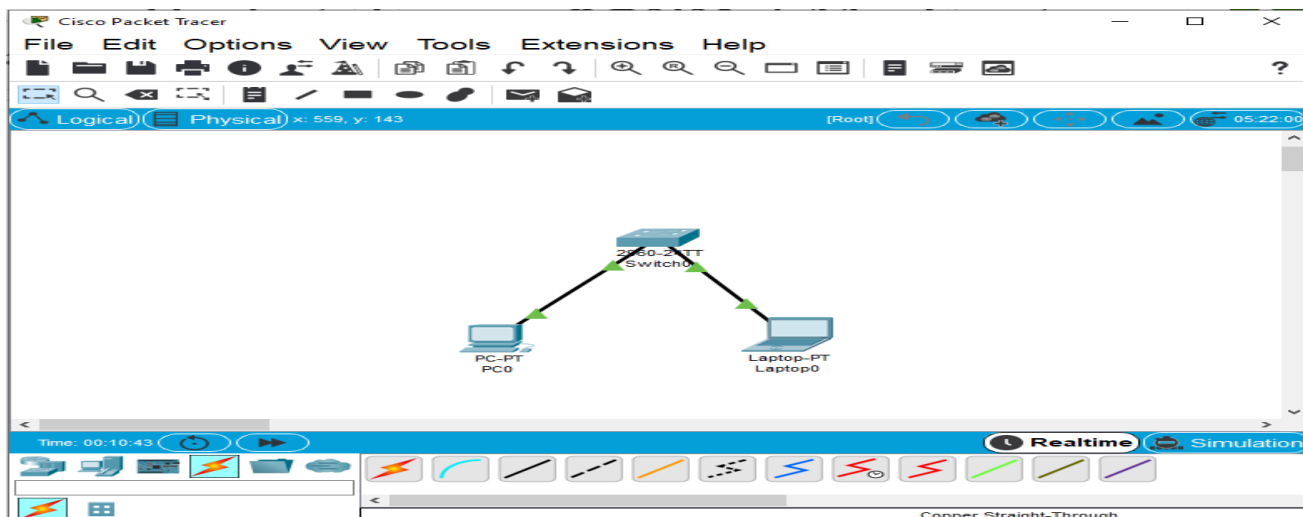
Commands like

- New to create new workspace
- Open to open saved packet tracer files
- Save to save packet tracer files
- Print to print packet tracer files

The next part we will introduce is the Menu bar section.

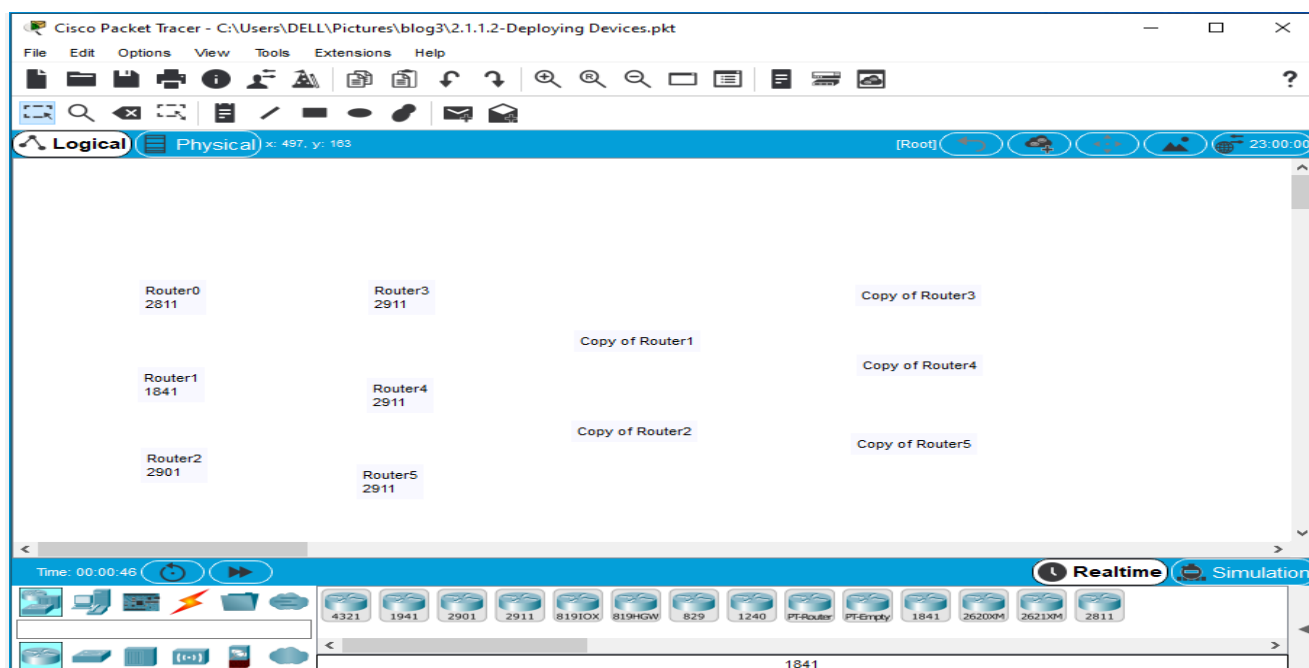


## 7. My First Packet Tracer Lab



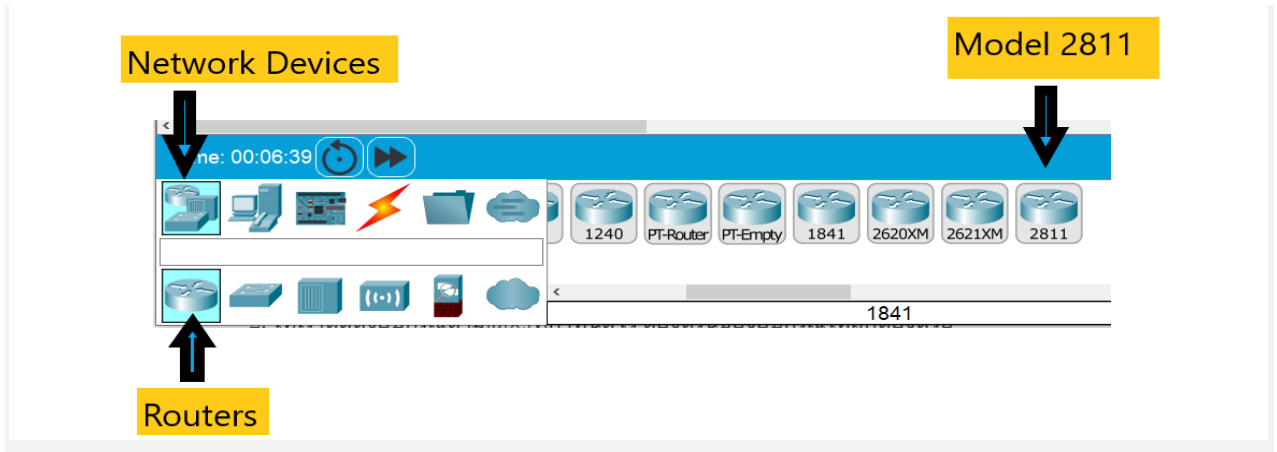
## 7.1. Deploying Devices

Open the file Lab-1-1-Deploying and Cabling Devices.pkt. The software will open as in the picture.



Let us install the device according to the specified label. Must see the correct device model too

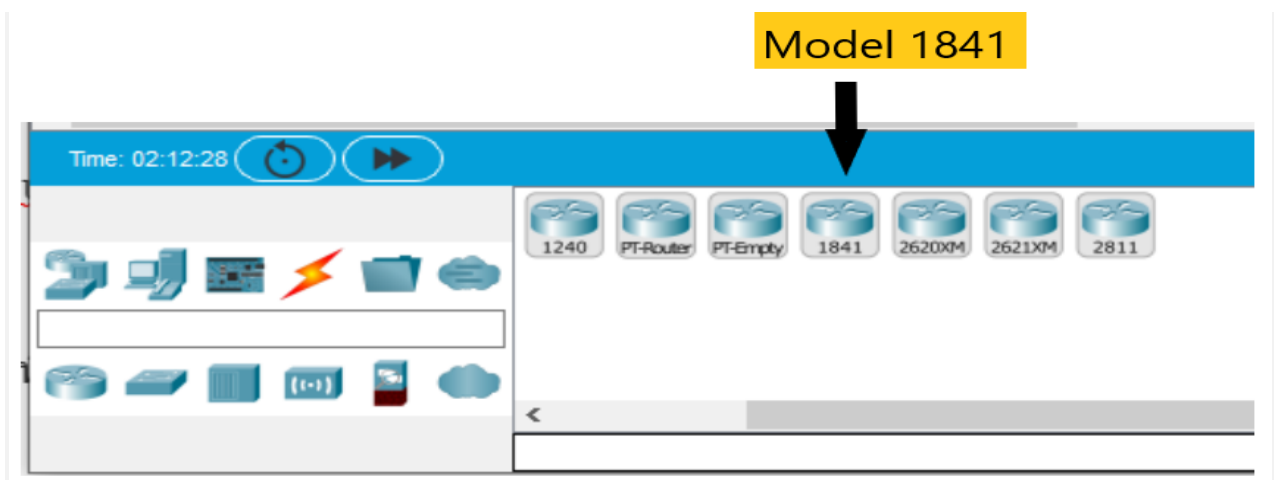
2.1 Install Router0 2811, click on the Network Devices device and click on Routers. Designated



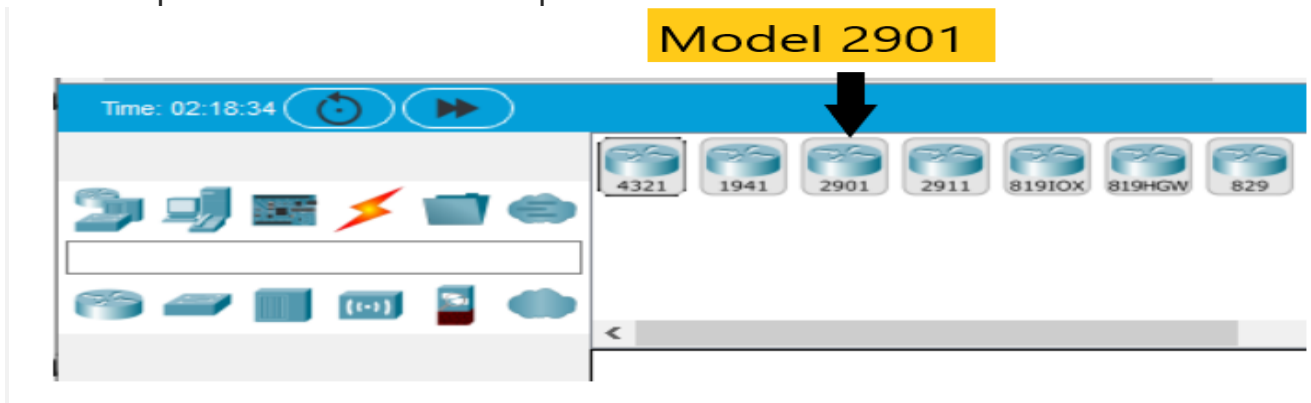
There are two ways to select a device to place on the workspace:

1. Click the desired device. Then click again on the workspace to place the selected device.
2. Left click on the device you want to select, then drag the mouse over the workspace.

2.2 Install Router1 1841, click to select Router 1841 as in the picture and put it on the workspace to match the label specified.

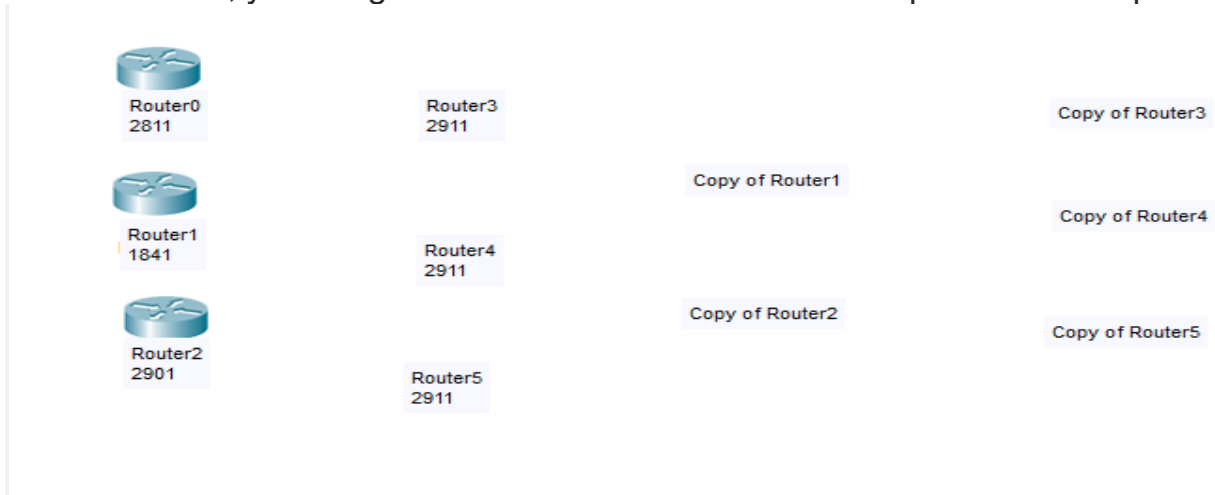


2.3 Install Router2 2901, click to select Router 2901 as in the picture and put it on the workspace to match the label specified.

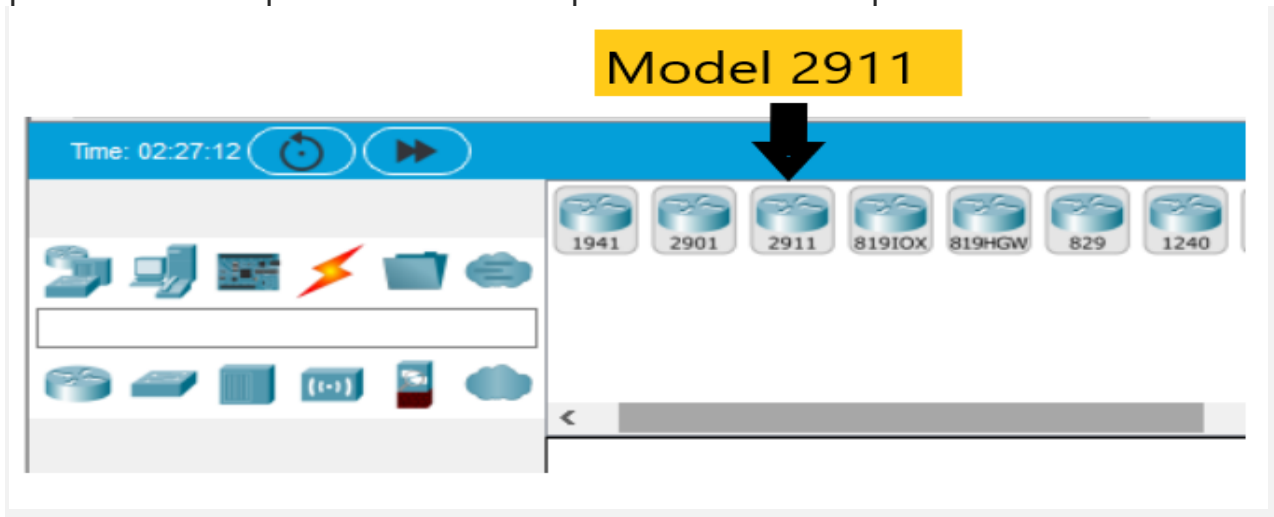




When finished, you will get the desired device on the workspace as in the picture.



2.4 SettingD Router 2911 provides for Router3,4,5 Router 2911 Click on the picture and then placed on the workspace to match the specified label.

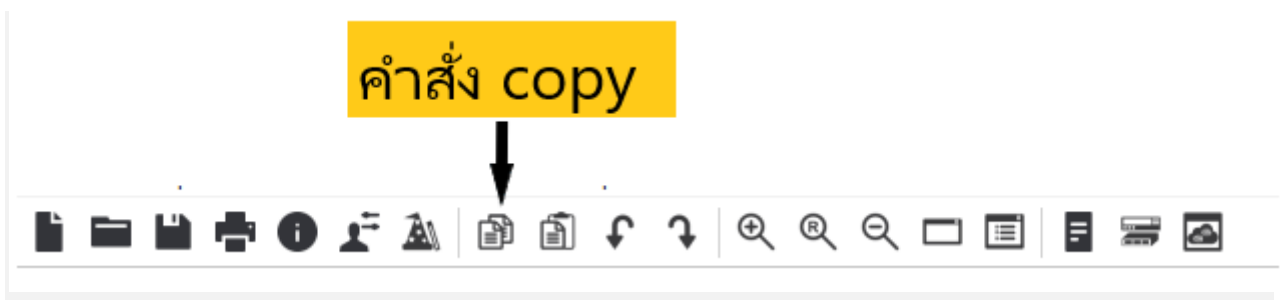


To place multiple devices of the same model at a time, press and hold Ctrl on the keyboard and click on the device, then release the Ctrl key and click on the workspace. To cancel or place the desired number of devices, press the Delete command or the keyboard shortcut Del.

When finished, you will get the desired device on the workspace as in the picture.

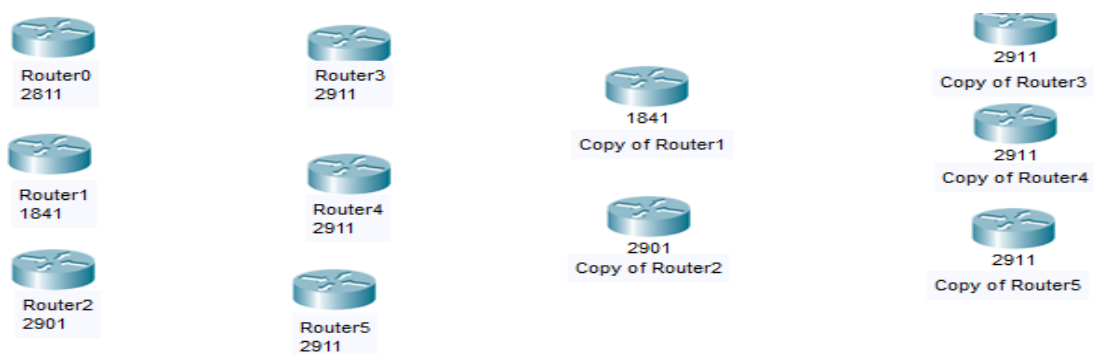


2.5 Please copy Router1–5 by using the command copy from Main Tool Bar as shown.



To use the copy command, select the desired device and click the copy command, then click the paste command next to it. We will have one more device, a device that has been copied, even a set of instructions that we set in the device.

When finished, you will get the desired device on the workspace as in the picture.

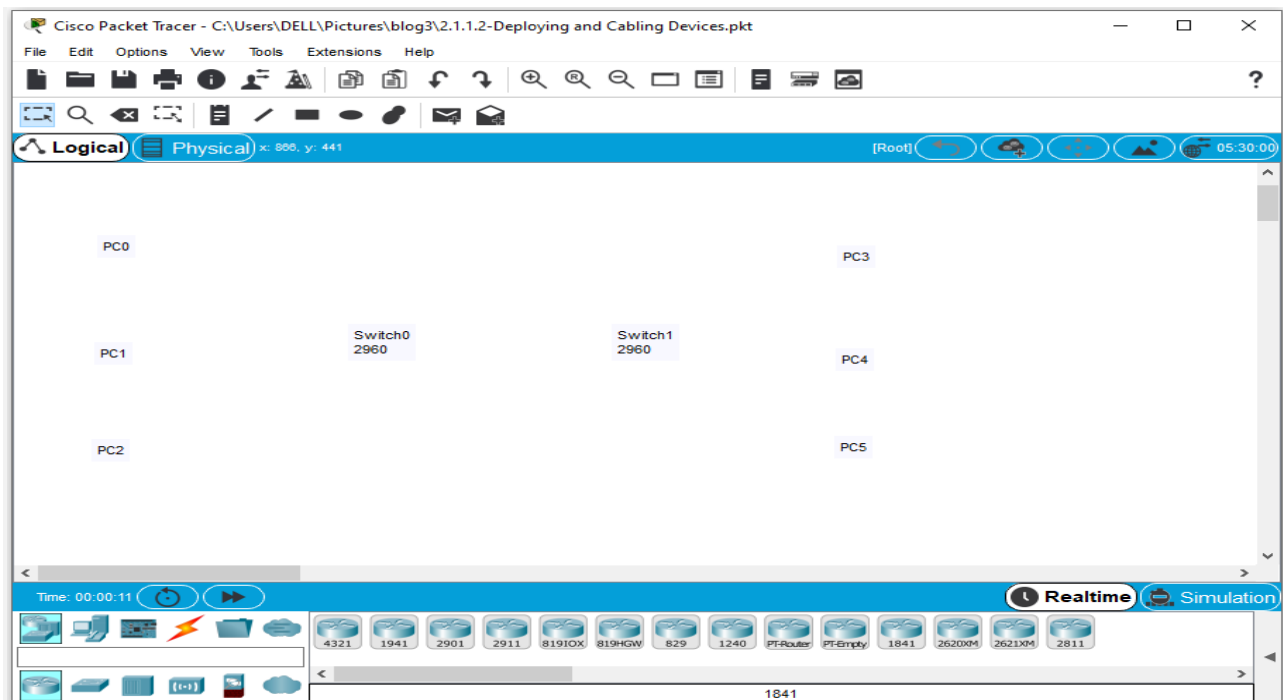


2.6 When finished and verified that it is correct, save it.

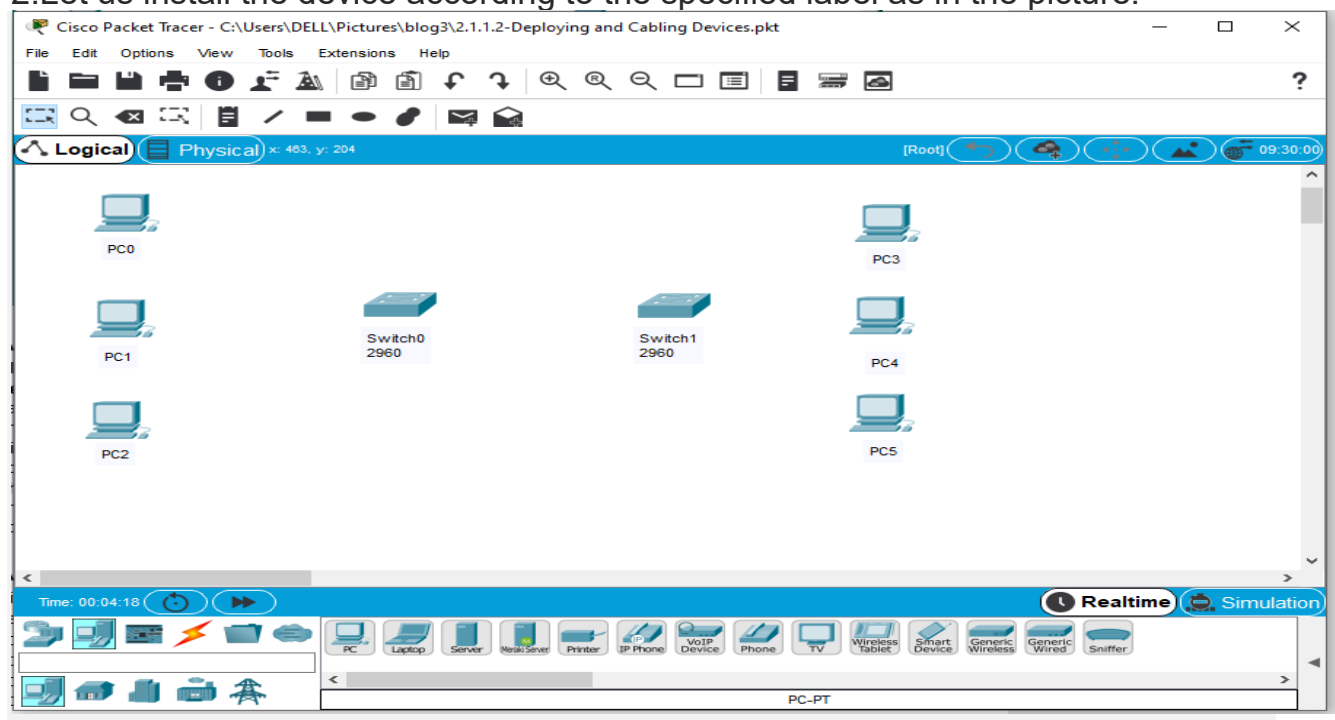
## 8. Deploying and Cabling Devices.

1. Please double click to open the file Lab-1-1-Deploying and Cabling Devices.pkt. The software will open as in the picture.





2. Let us install the device according to the specified label as in the picture.

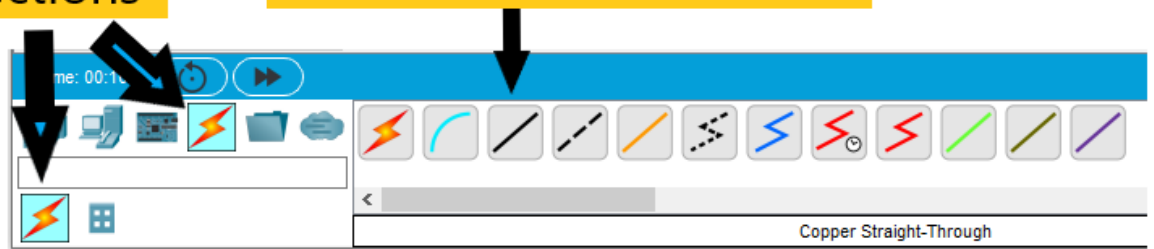


3. The next step is to connect the signal cables together between the PC and Switch.

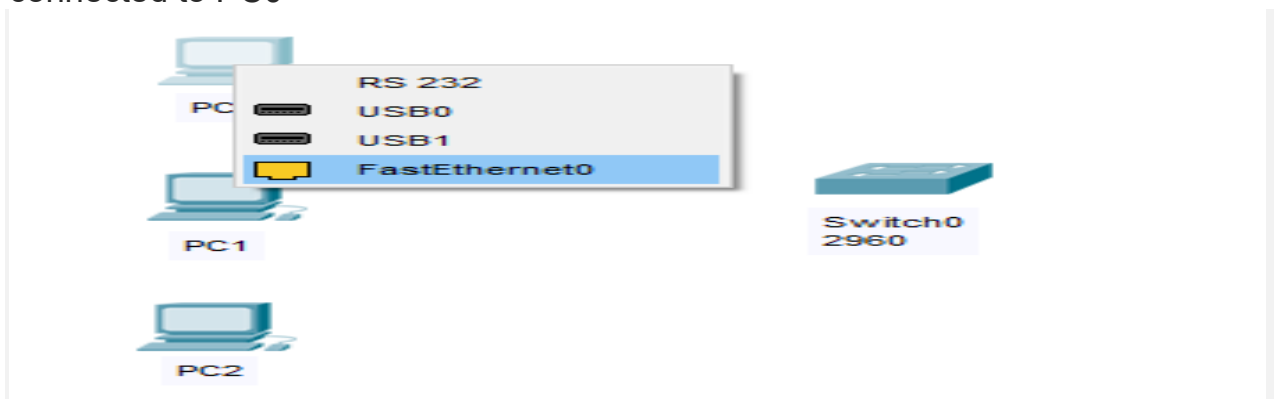
3.1 Click on the Connections device group and click on the Copper Straight-Through cable as shown in the picture.

## Connections

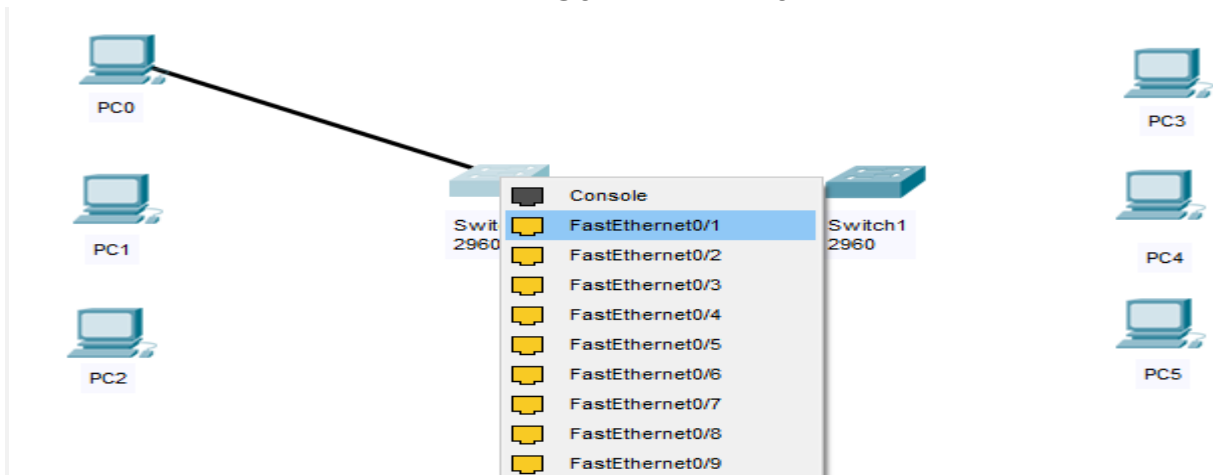
## Copper Straight-Through



3.2 Click to select PC0, then a menu box will pop up to click to select. FastEthernet0 as shown, after that you will see that a signal cable is connected to PC0

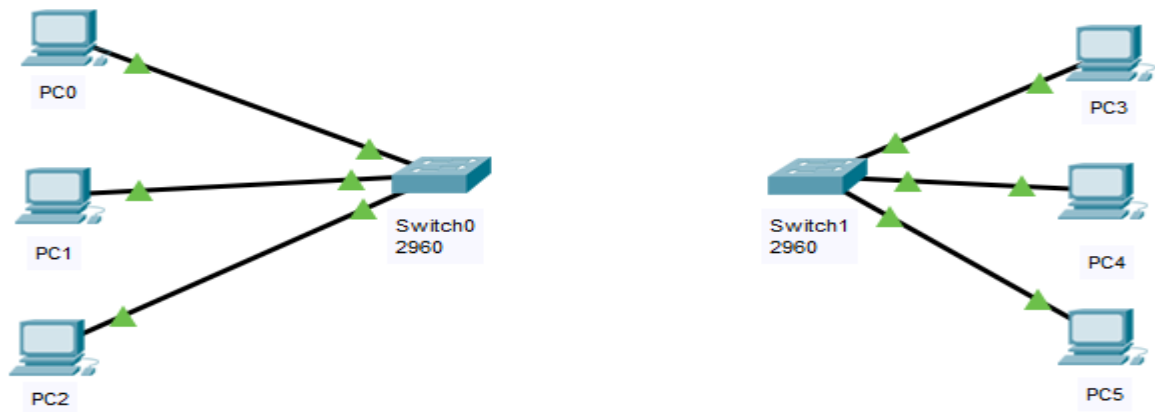


3.3 Click to select Switch0, there will be a menu box to click to select. FastEthernet0 / 1 as shown in the figure, after which the signal cables are connected to each other between PC0 and Switch0.

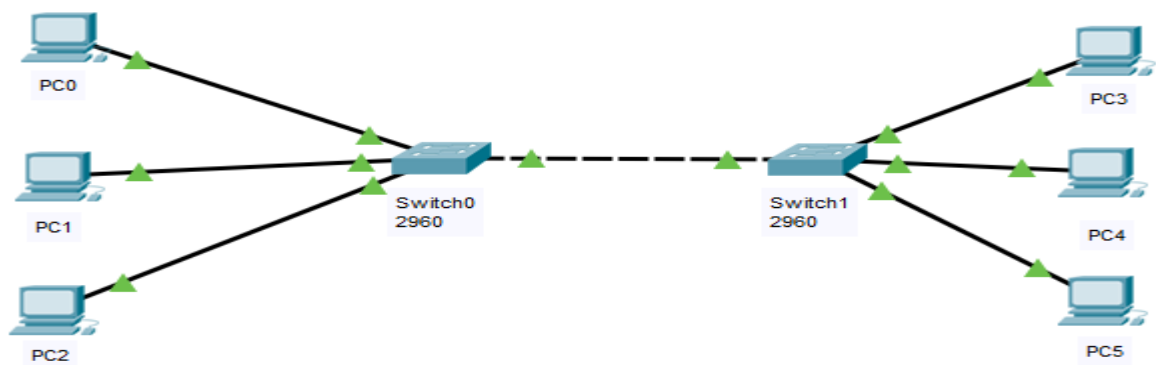


3.4 Connect the remaining PC devices to Switch as follows:

- ✓ PC1 FastEthernet0 to Switch0 FastEthernet0 / 2
  - ✓ PC2 FastEthernet0 to Switch0 FastEthernet0 / 3
  - ✓ PC3 FastEthernet0 to Switch1 FastEthernet0 / 1
  - ✓ PC4 FastEthernet0 to Switch1 FastEthernet0 / 2
  - ✓ PC5 FastEthernet0 to Switch1 FastEthernet0 / 3
- When completed, will see the picture.



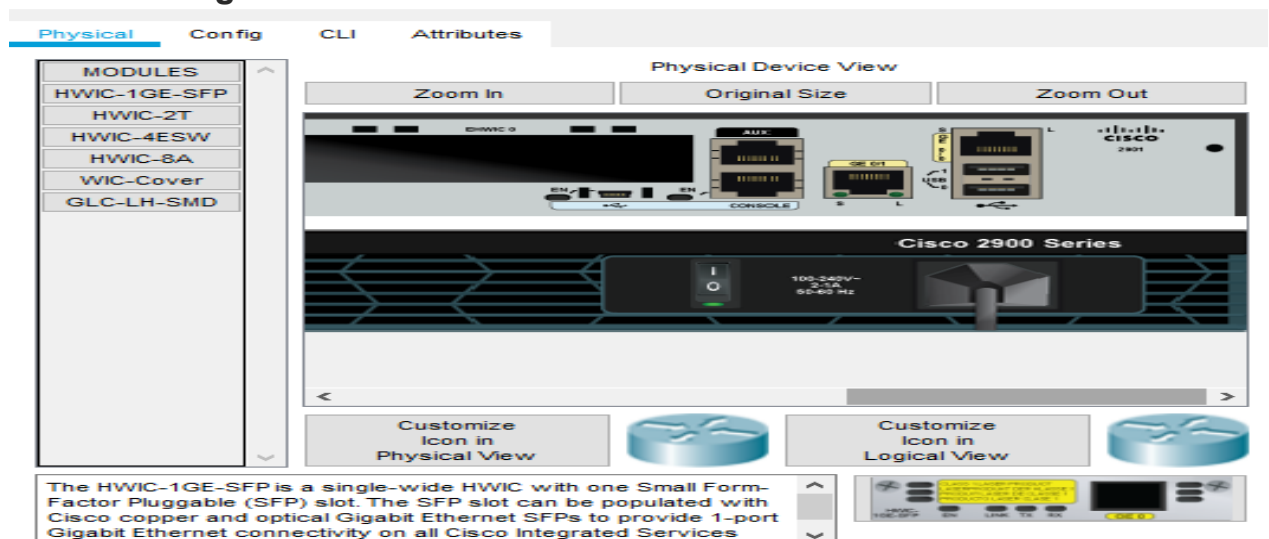
3.5 The next step is to connect the signal cable between Switch0 and Switch1, which must select the cable type as Copper Cross-Over and connect it to place. GigabitEthernet0 / 1 of Switch0 and GigabitEthernet0 / 1 of Switch1 as shown.



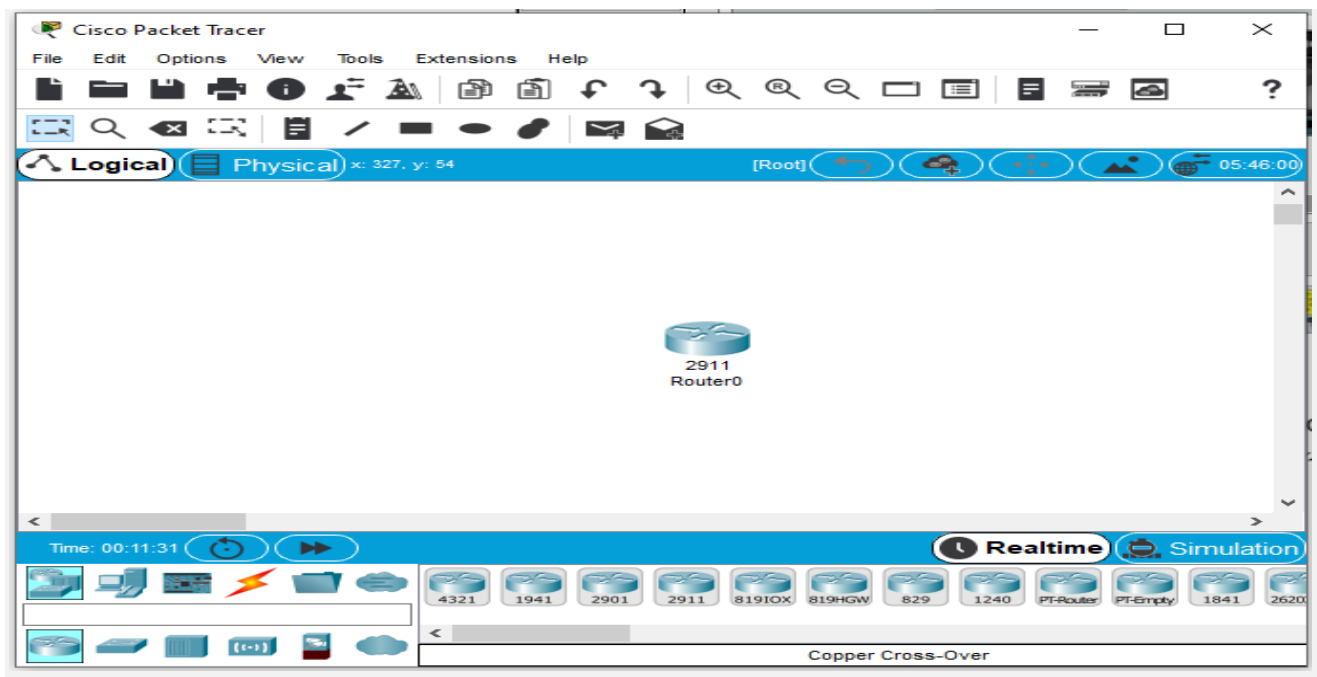
3.6 When finished and verified that it is correct, save it.

For the Lab, we have now learned how to choose different types of

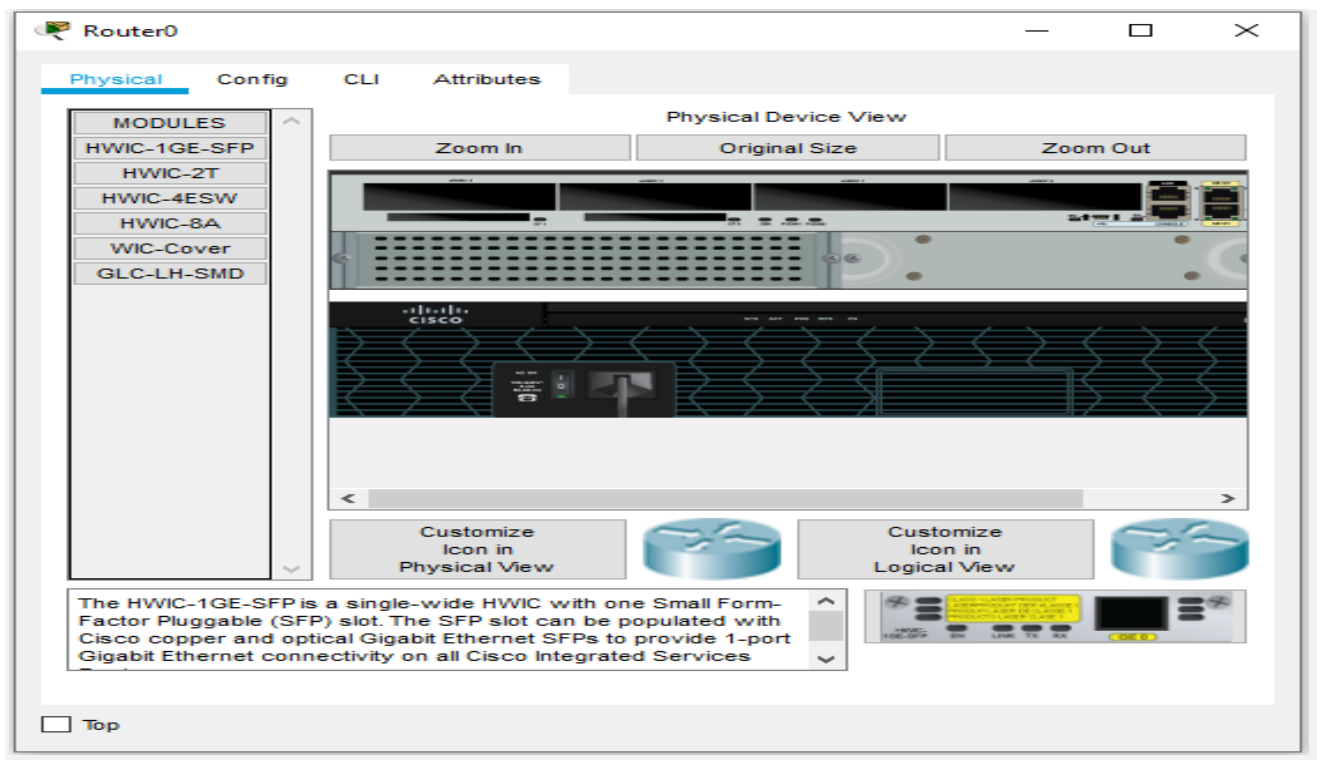
## 9. Device Configuration



This is of this article explains how to set up the device in the packet tracer, starting with selecting the device to place in the workspace such as Router Model 2911 as shown.



Click on the device that is placed in the workspace, the settings window will appear as in the picture.



The first menu bar is Physical. We will see the model of the device from the real thing. This will show both the front and the back of the device.

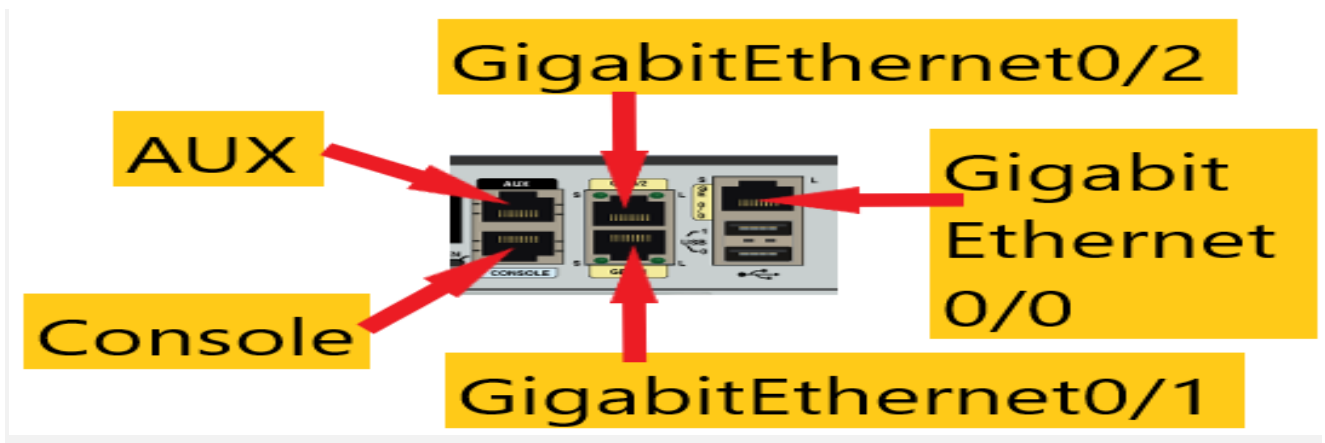
The first part that will be introduced is Physical Device View. There will be a Zoom In

button that can enlarge the device image to be larger. It will be more obvious. The Original Size button when you click the button will return to show the normal size of the device. Clicking on the button will adjust the device size to be smaller so that the whole device is visible.

The device image of router 2911 is now seen in the picture above, there are four black spaces, that is, slots for inserting different kinds of modules to correspond to the usage.



The next section is the network connection port, that is, the port GigabitEthernet0 / 0, GigabitEthernet0 / 1, GigabitEthernet0 / 2 as shown.



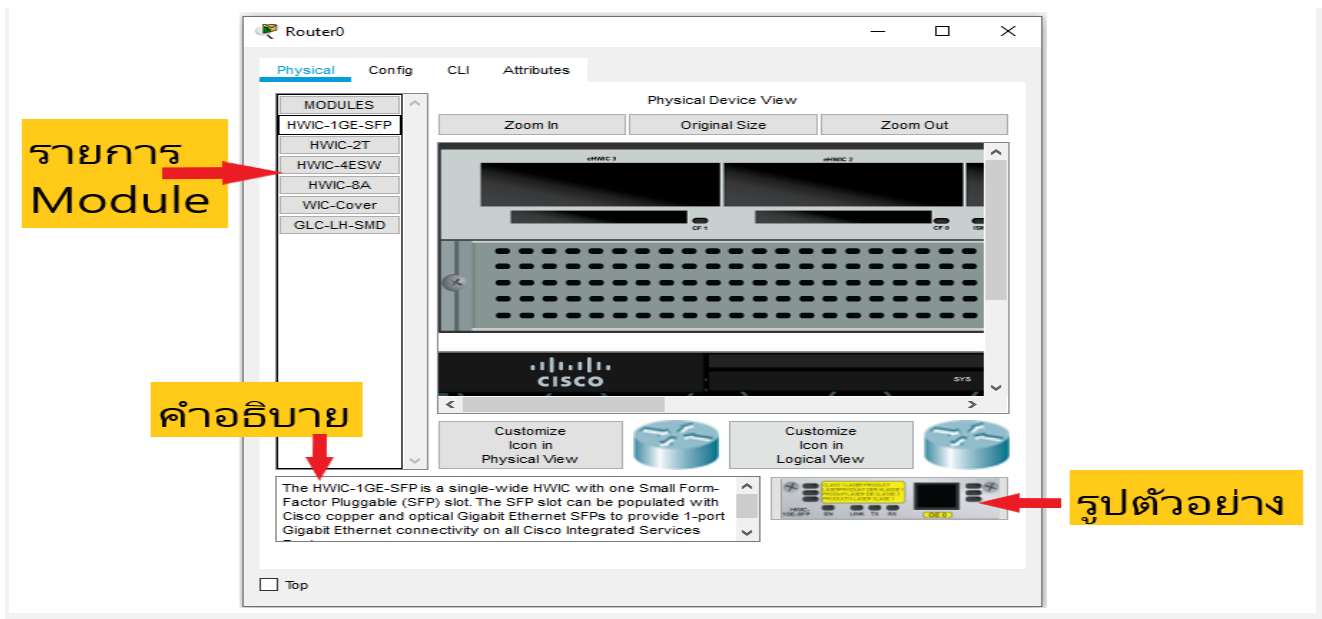
The AUX port is for connection to an external analog modem. To enable remote device configuration.

Console port is for connection to a computer via Rollover cable so that the device can be set up. Which is the most commonly used port than the AUX port

The pictureThe the bottom of the device to switch - off the device. We have to turn off the device first every time if you want to install the Module to use, otherwise the packet tracer will not allow it to be installed.

We are still at the Physical menu. The next part we will introduce is Module, which consists of various modules that can be installed as follows:

1. HWIC-1GE-SFP which we can see the explanation below as shown in the figure.



2. HWIC-2T

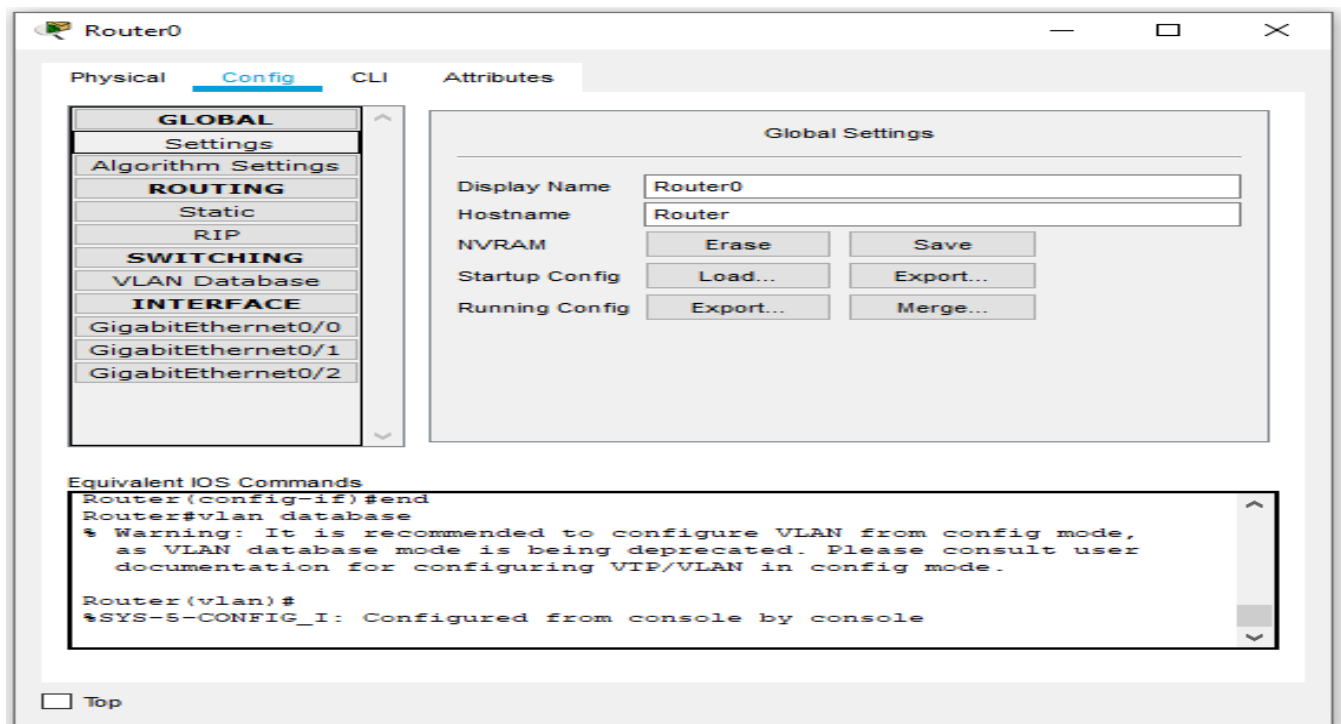
3. HWIC-4ESW

4. HWIC-8A

5. WIC-Cover

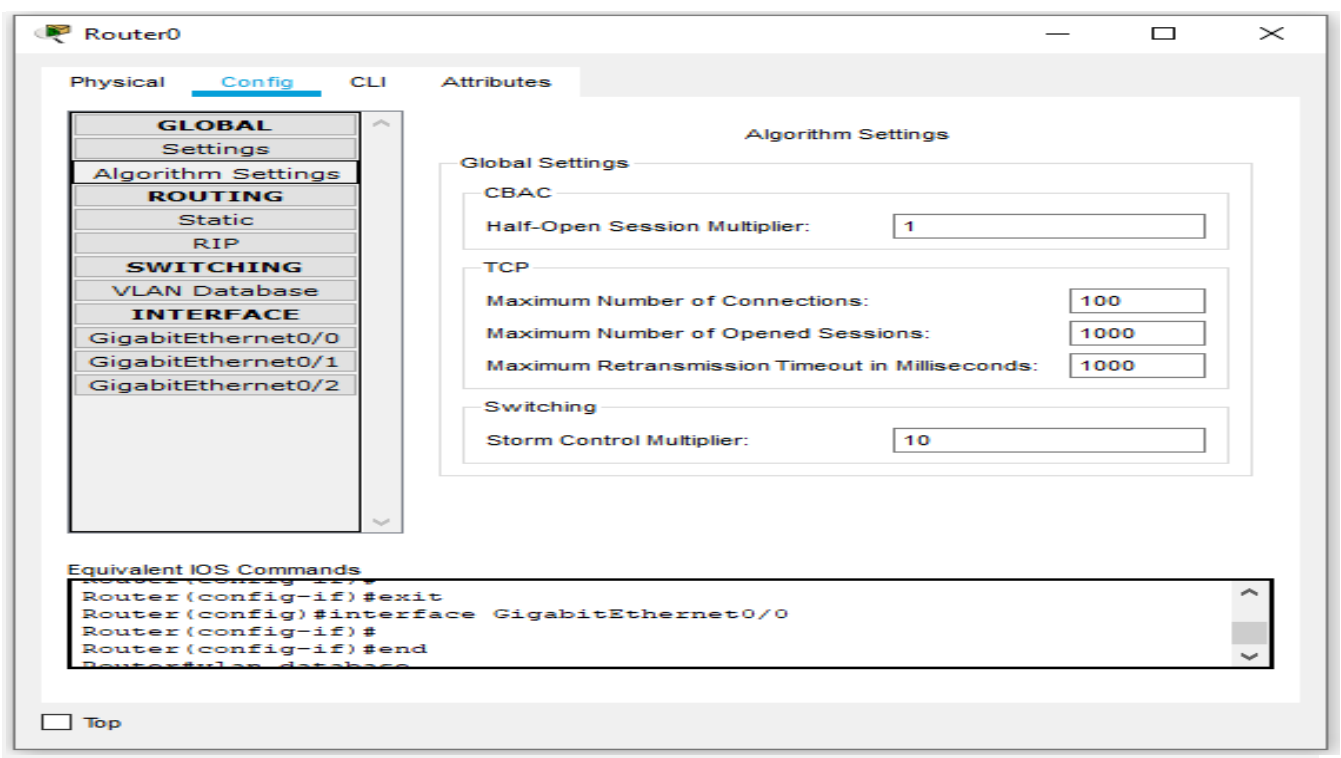
6. GLC-LH-SMD

Next menu bar will be Config as in the picture.



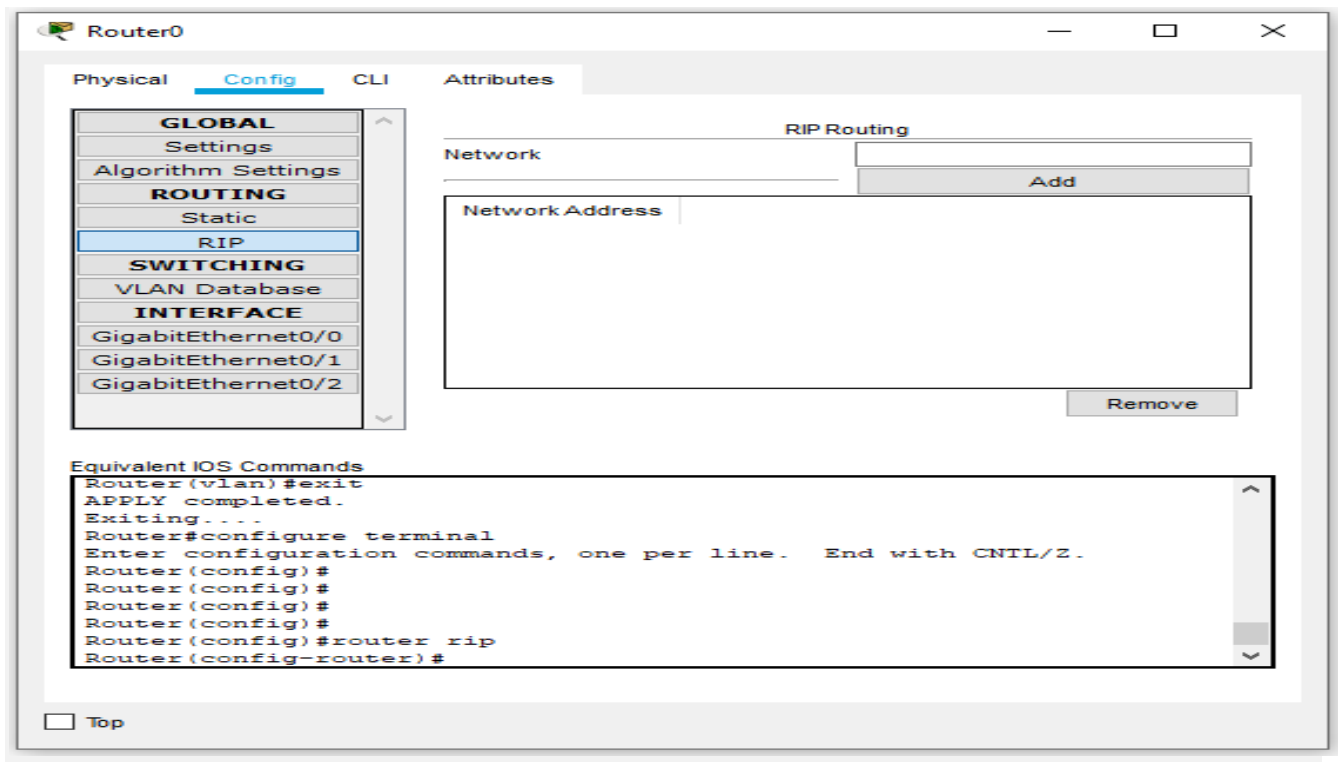
The first menu is GLOBAL

- Settings can set Display Name, Hostname. This will be the name of the device.
- Algorithm Settings can be set in part. CBAC, TCP, Switching



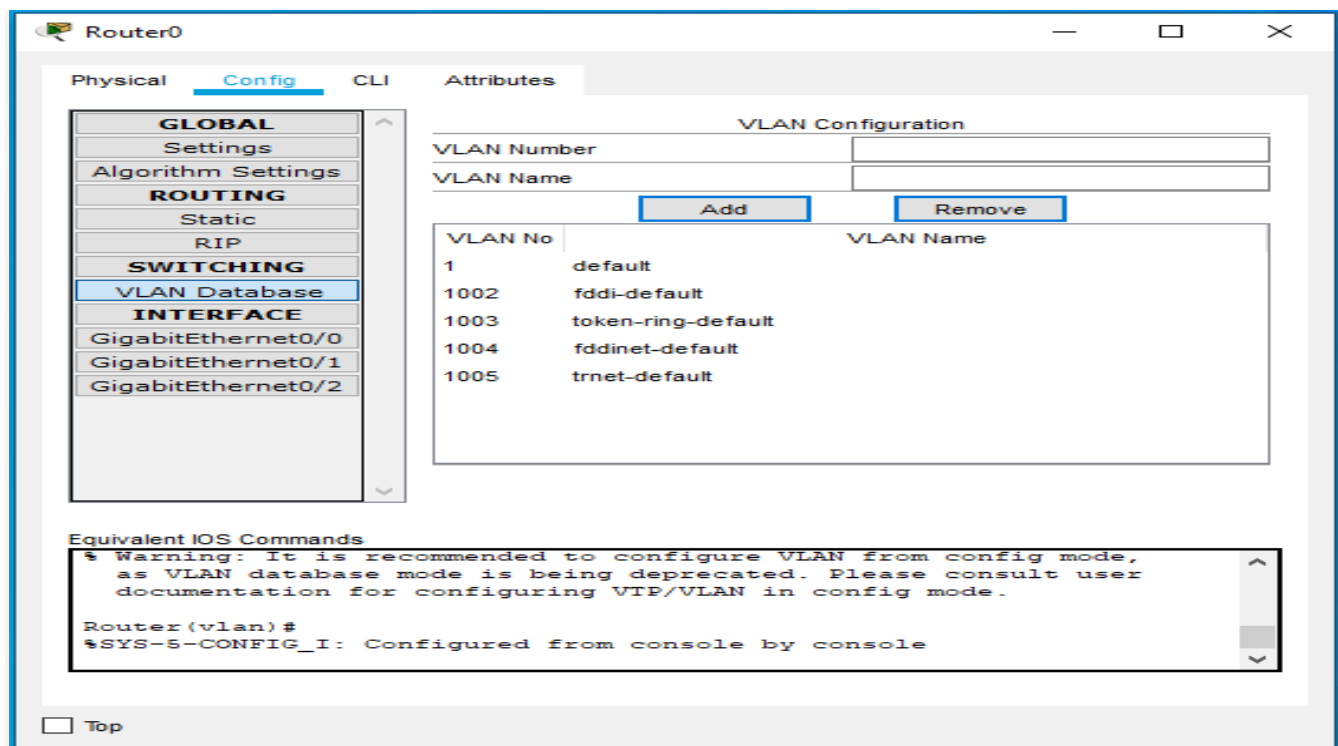
ROUTING menu

- Static can set static route as needed
- RIP can set route as needed.



## Menu SWITCHING

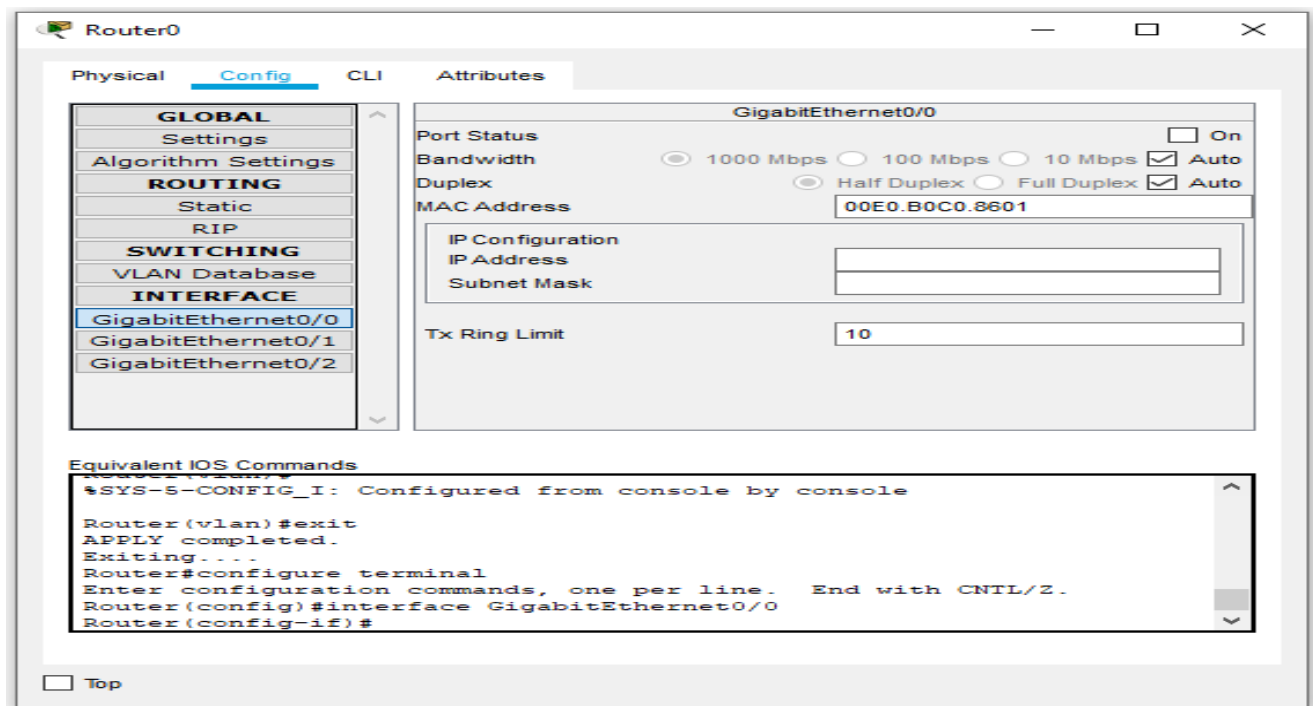
- VLAN Database is able to create vlan as needed.



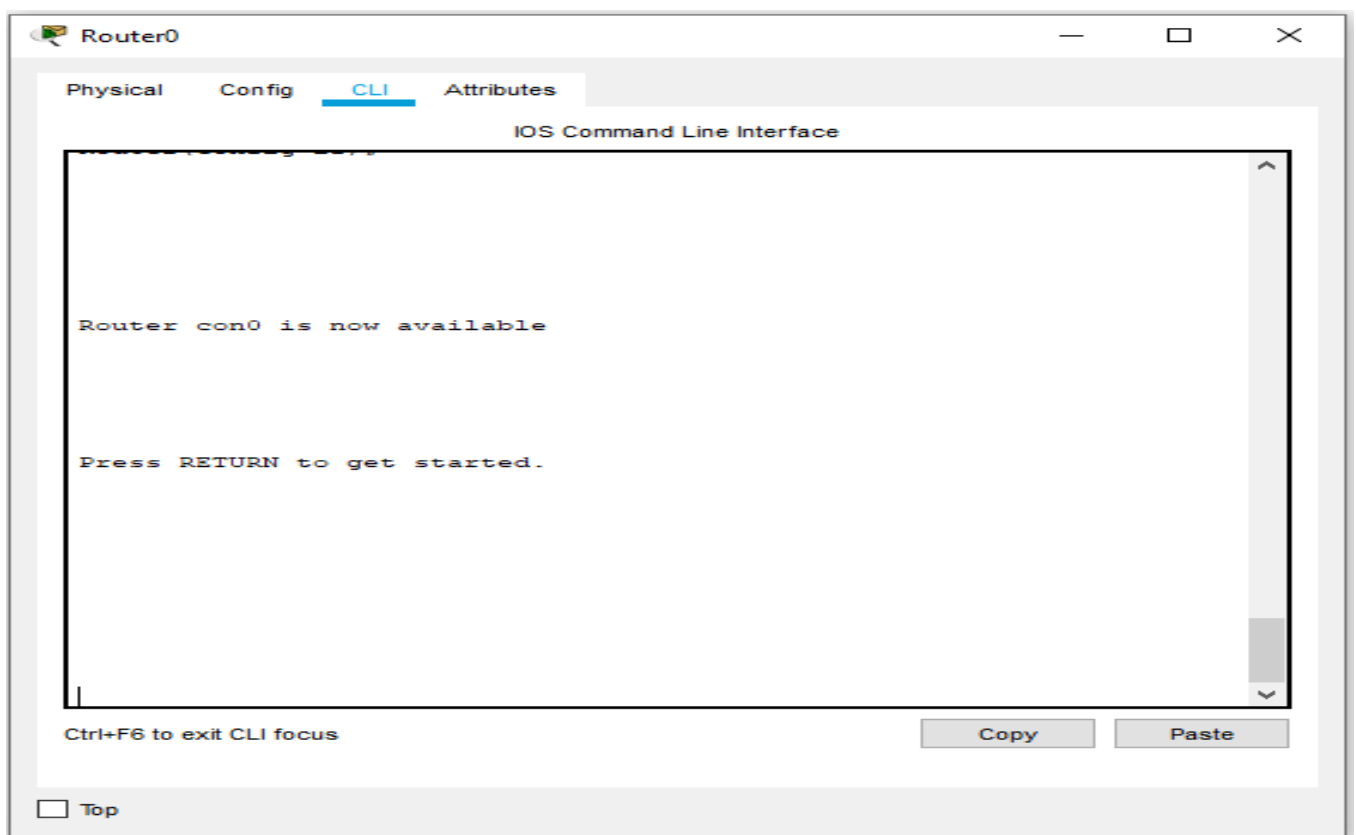
## Menu INTERFACE

- GigabitEthernet0 / 0 Can set bandwidth, duplex, MAC Address, IP Address, Subnet Mask
- GigabitEthernet0 / 1. Can be set up like GigabitEthernet0 / 0
- GigabitEthernet0 / 2 Can be set up like GigabitEthernet0 / 0

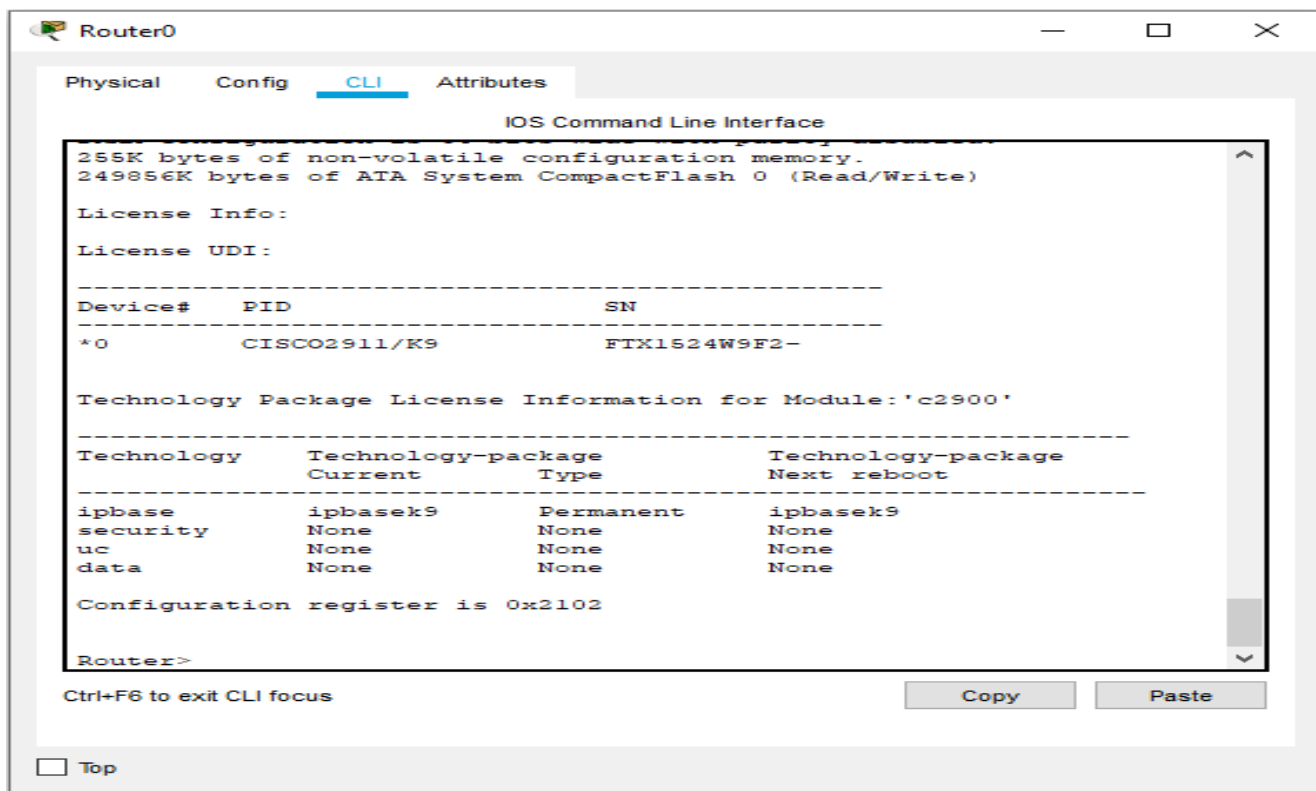




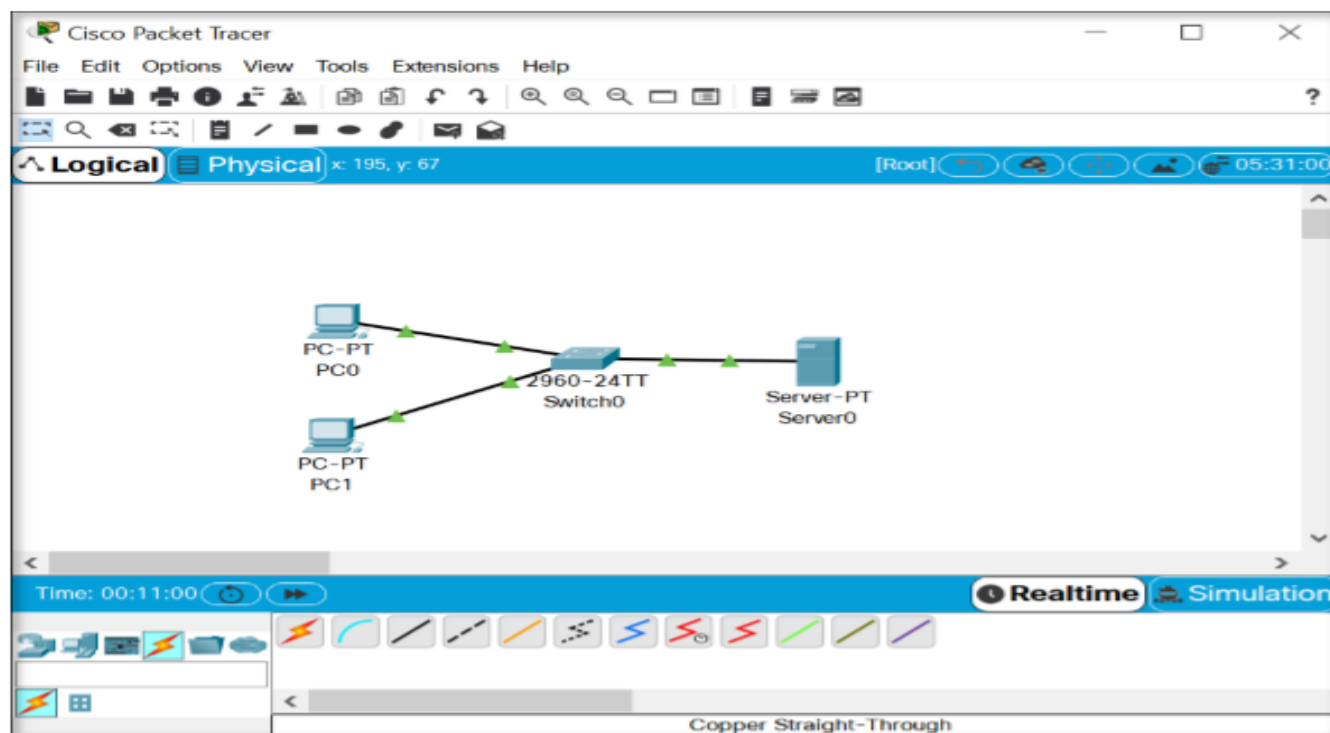
The next menu bar will be CLI as in the picture.



Usually, we use the CLI menu to set up the device with different commands. Which we can type commands into it, such as show version command as in the picture

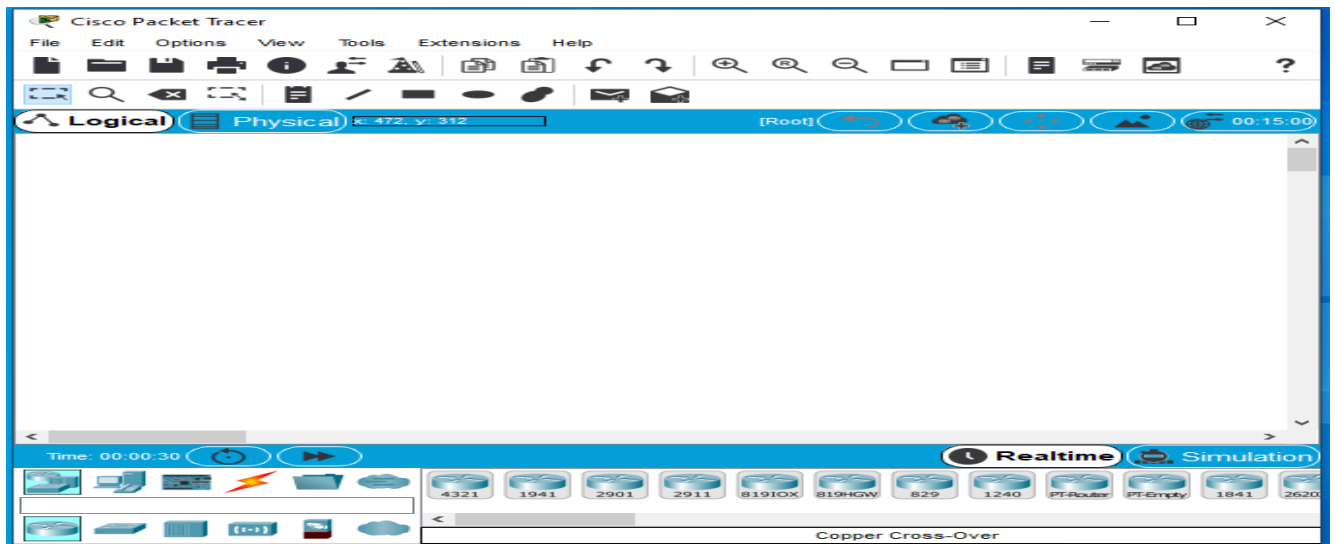


## 10. Configure End Devices Lab



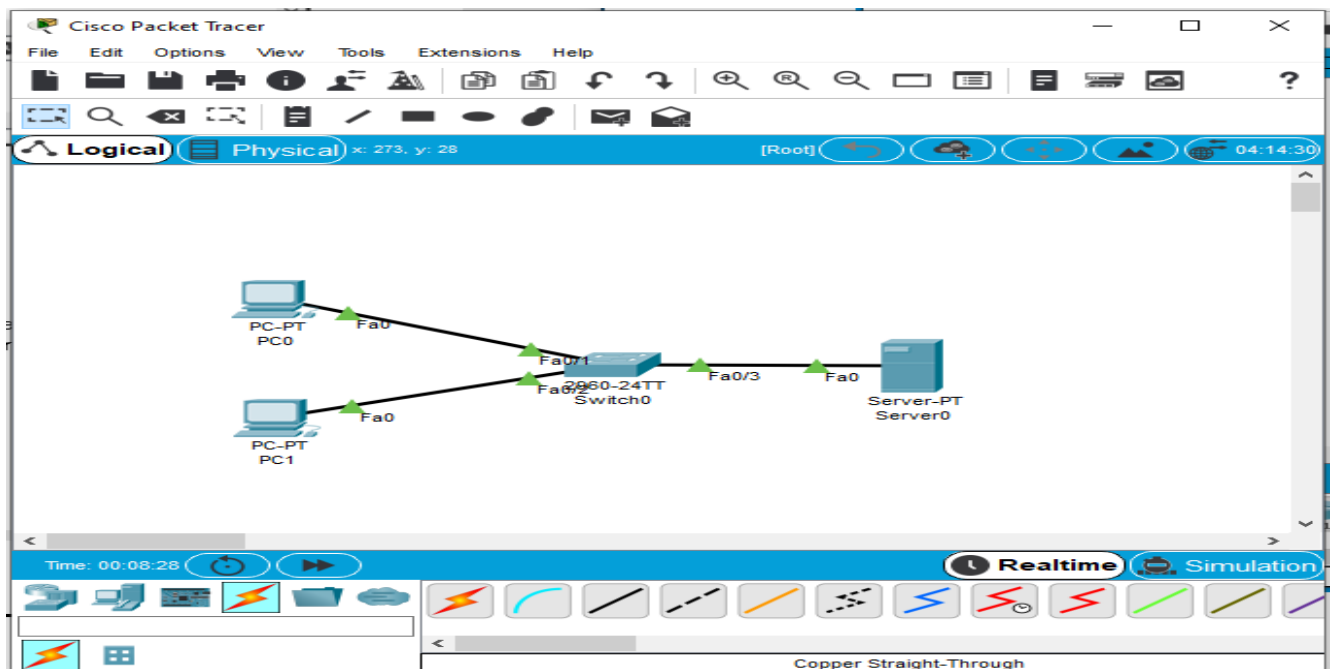
This article will guide you through setting up your device. So that devices can send information to each other Let's get started.

Open the Cisco Packet Tracer.



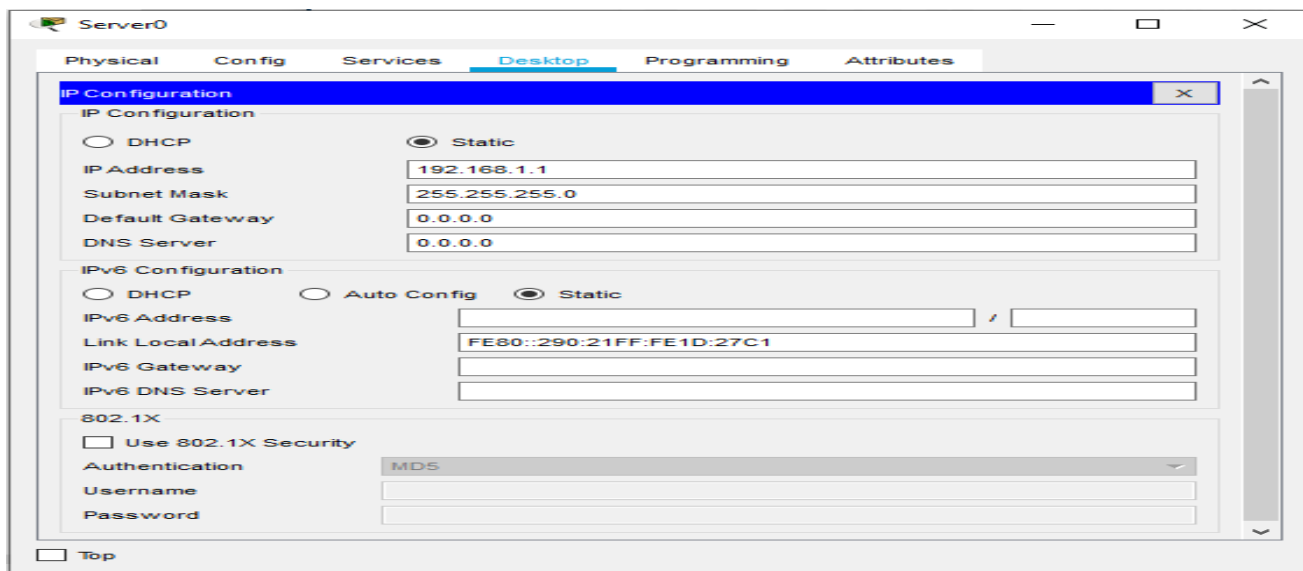
To create a network as in the picture

- Connect PC0 to FastEthernet0 / 1 port of Switch0
- Connect PC1 to FastEthernet0 / 2 port of Switch0
- Connect Server0 to FastEthernet0 / 3 port of Switch0.



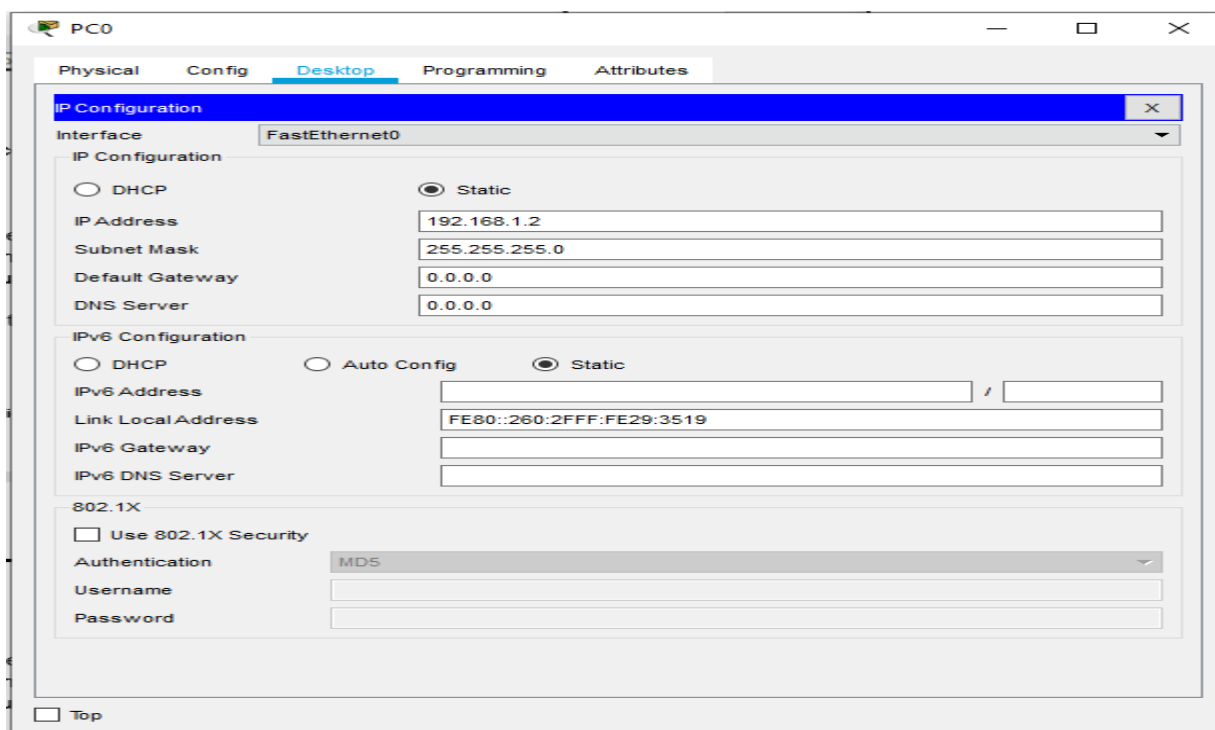
Set Server0 as follows

- Click on the Desktop menu bar
- Click the IP Configuration icon
- Specify the IP Address 192.168.1.1
- Subnet Mask is default. 255.255.255.0
- Close the settings window.

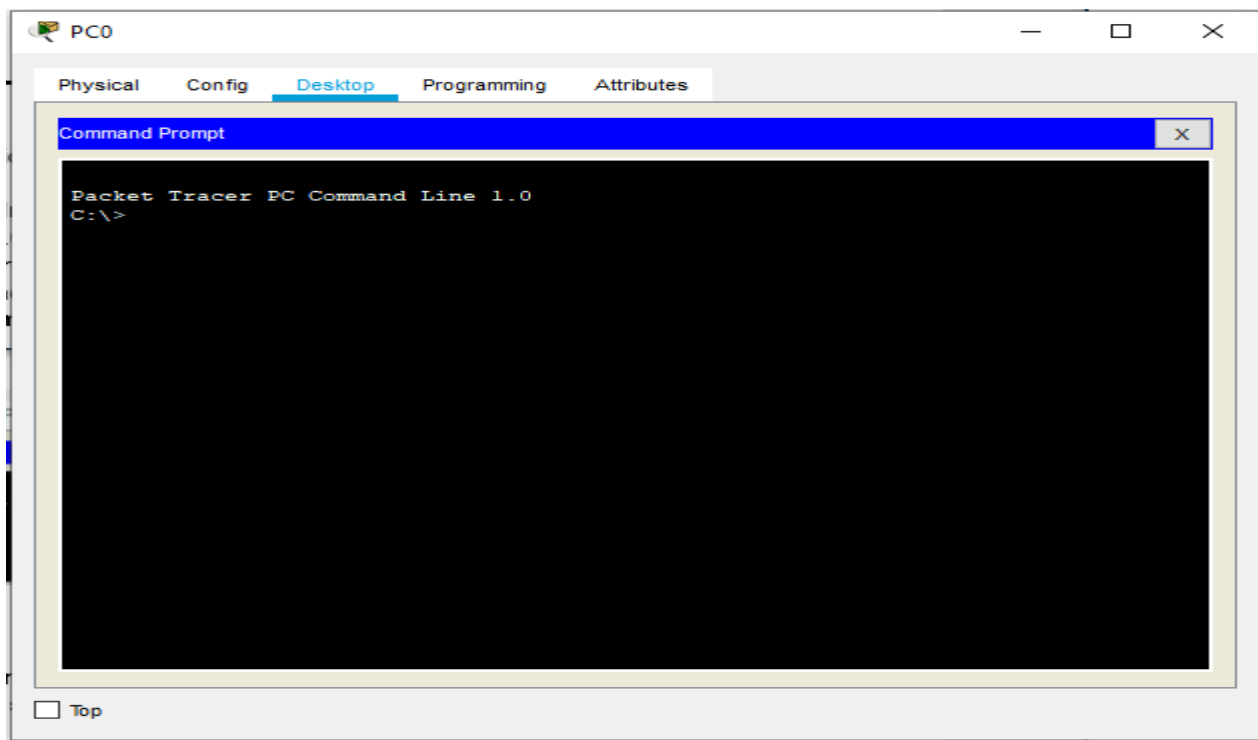


Set PC0 as follows

- Click the The menu bar on the Desktop
- Click the Configuration icon in the IP
- Identify the IP Address is 192.168.1.2
- Use the Mask subnet This is the default setting. 255.255.255.0
- Close the settings window.

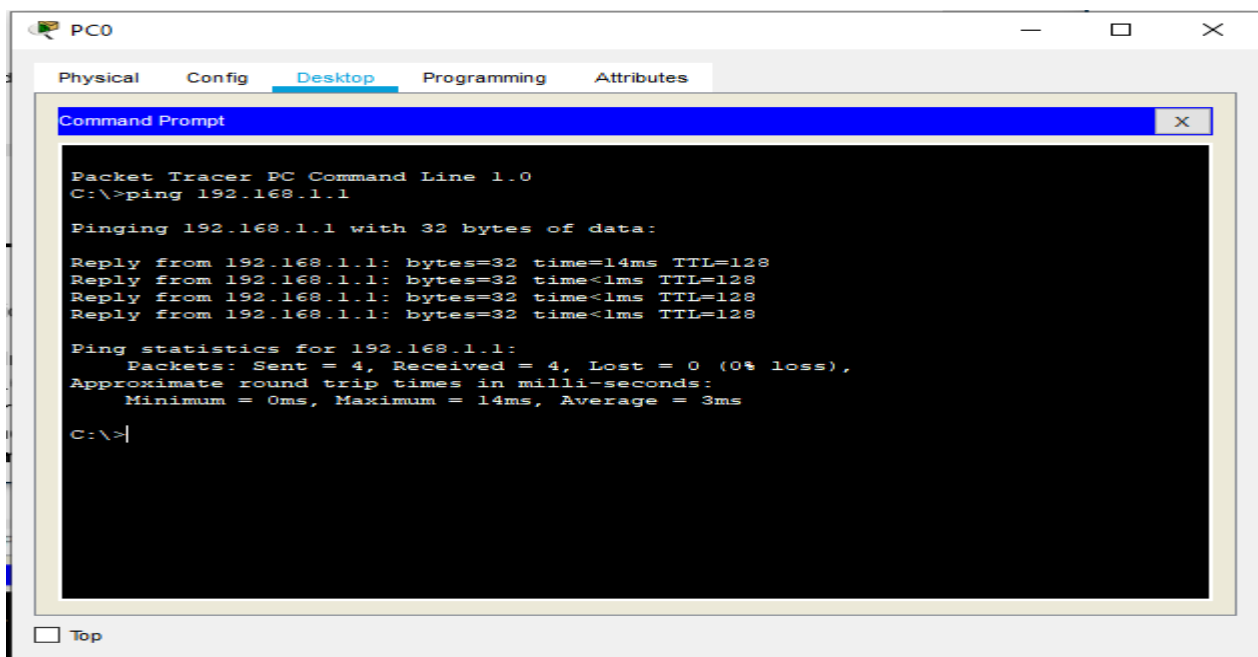


- Click the Command Prompt icon. A window will appear as shown.



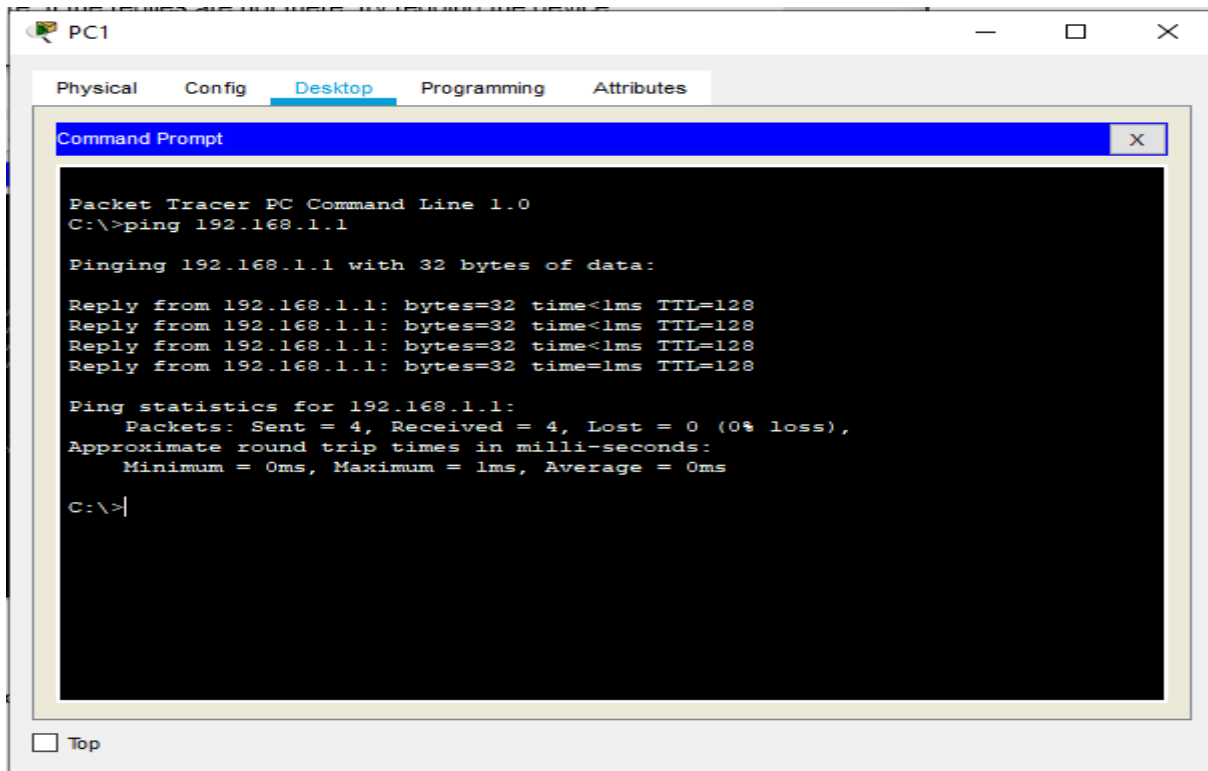
g. Type the command ping 192.168.1.1 and press the Enter key on the keyboard

h. If the device is set up correctly, the result will be shown as shown.

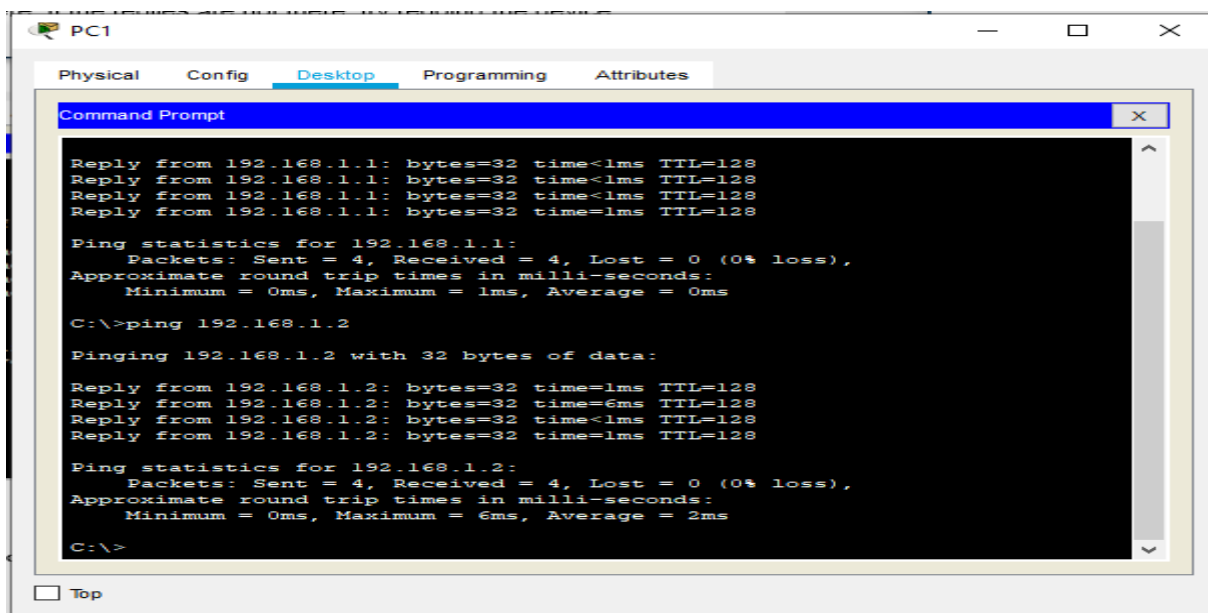


i. Close the Command Prompt window and the PC settings window.

.Set PC1 using the same method as PC0, but change IP Address to 192.168.1.3 and test with ping 192.168.1.1, the result must be the same as PC0.



And can use ping 192.168.1.2 to PC0 as well

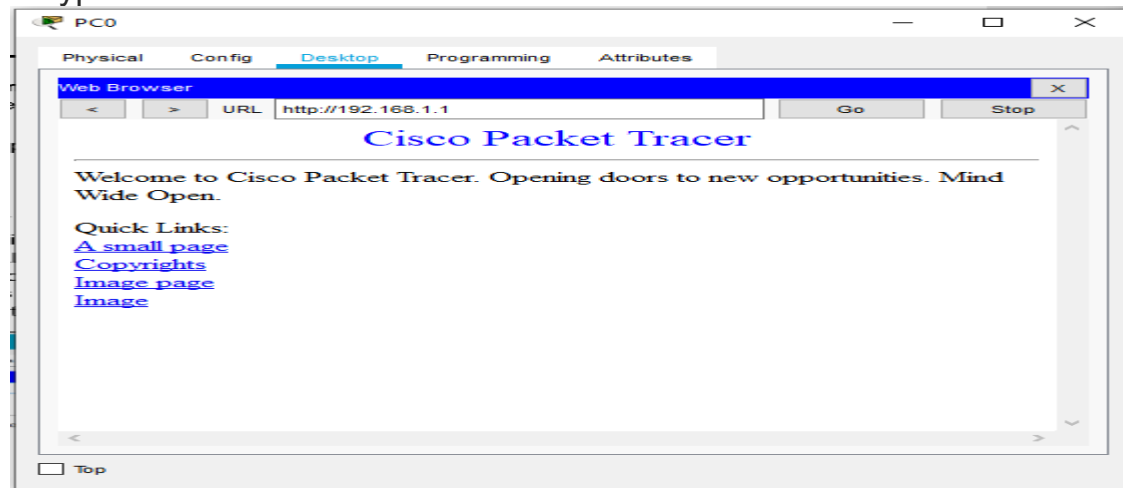


Close the Command Prompt and the Settings window.

**Click on PC0 and try as follows.**

- Click on the Desktop menu bar
- Click the Web Browser icon

c. Type the IP Address 192.168.1.1 and click Go



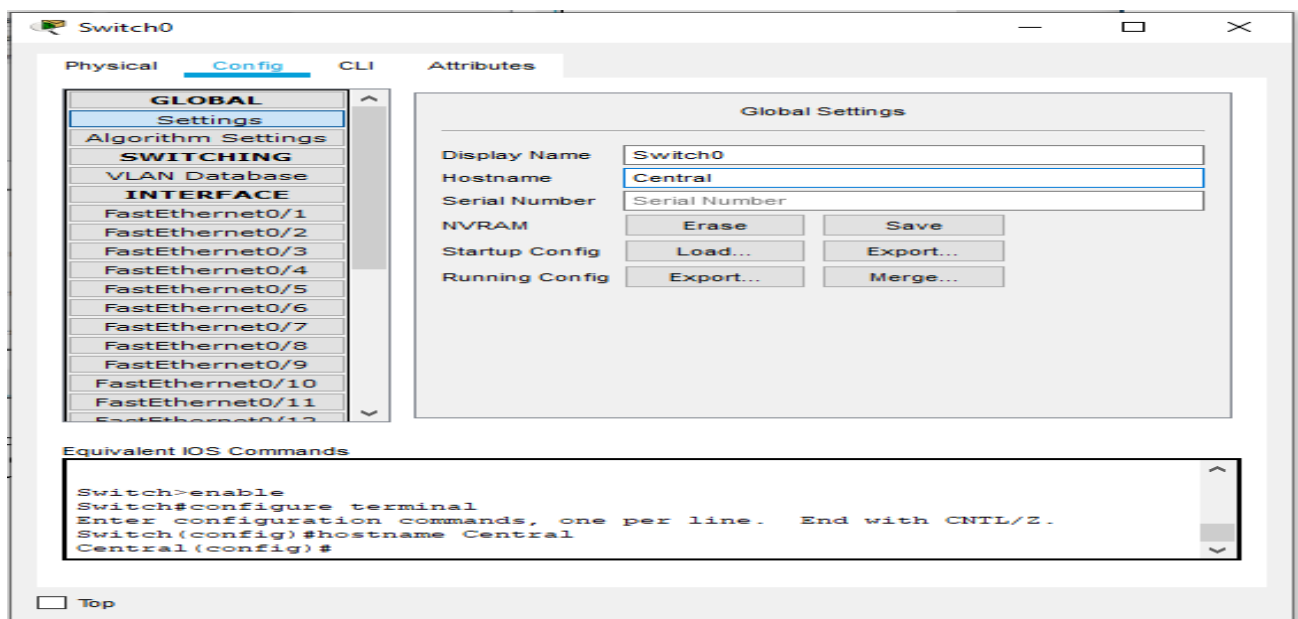
e. Click test links, see changing web pages

f. Close Web Browser window and PC settings window.

**Click on Switch0 and then click on the Config menu bar.**

a. At the Global Settings menu, we can change the device name to be displayed in the workspace and the device Hostname, which is the name within the device

b. Change the Hostname to Central and press the Enter key on the keyboard. The packet tracer will show the corresponding ISO commands. To change the Hostname name in the Equivalent IOS Commands field as in the picture.



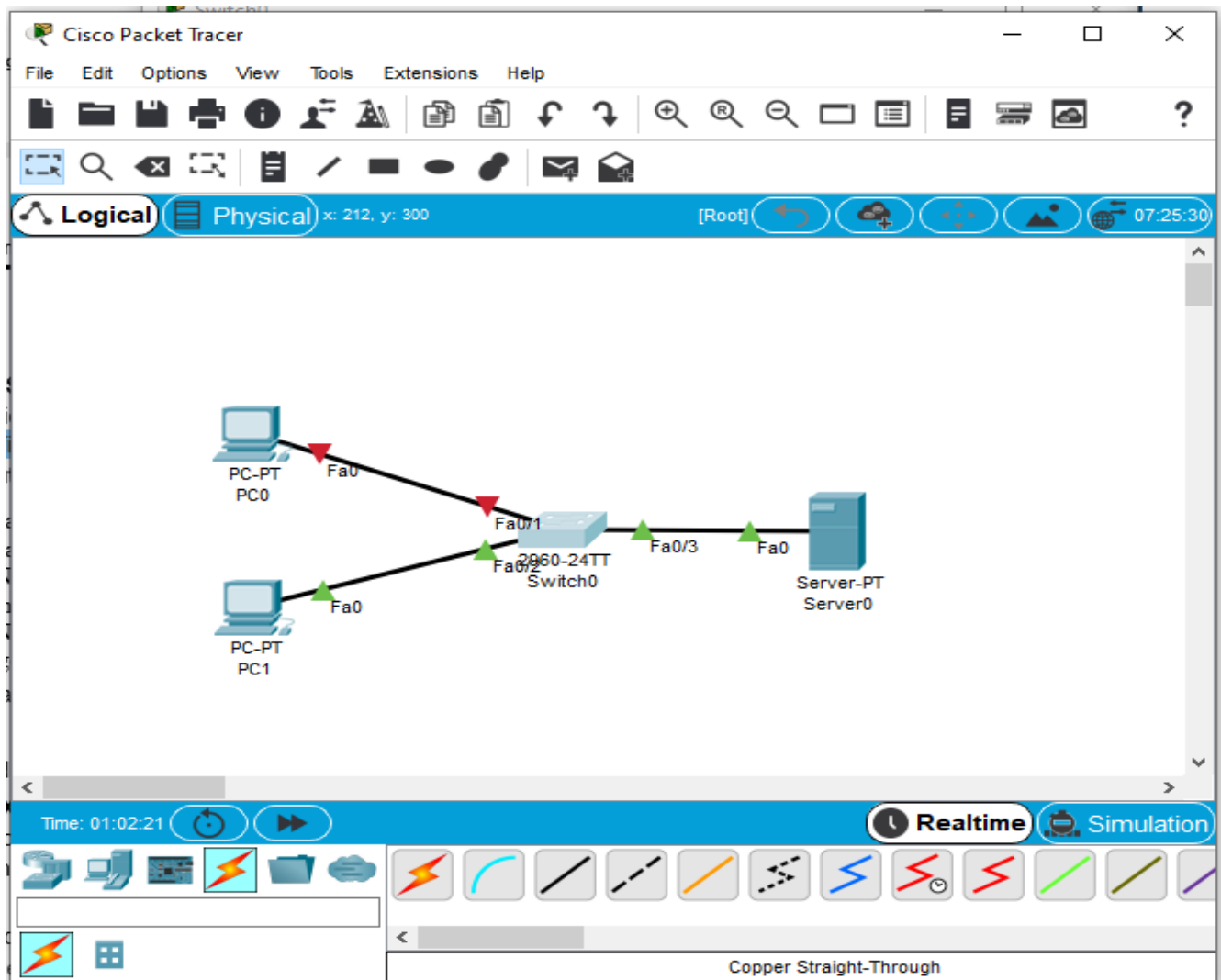
The enable, configure terminal, hostname Central commands are the commands that we will use to configure the actual device

. C. Click the FastEthernet0 / 1

d menu . In the Equivalent IOS Commands box it will display the interface FastEthernet0 / 1.







We can test ping 192.168.1.1 from PC0 and get the result as shown.

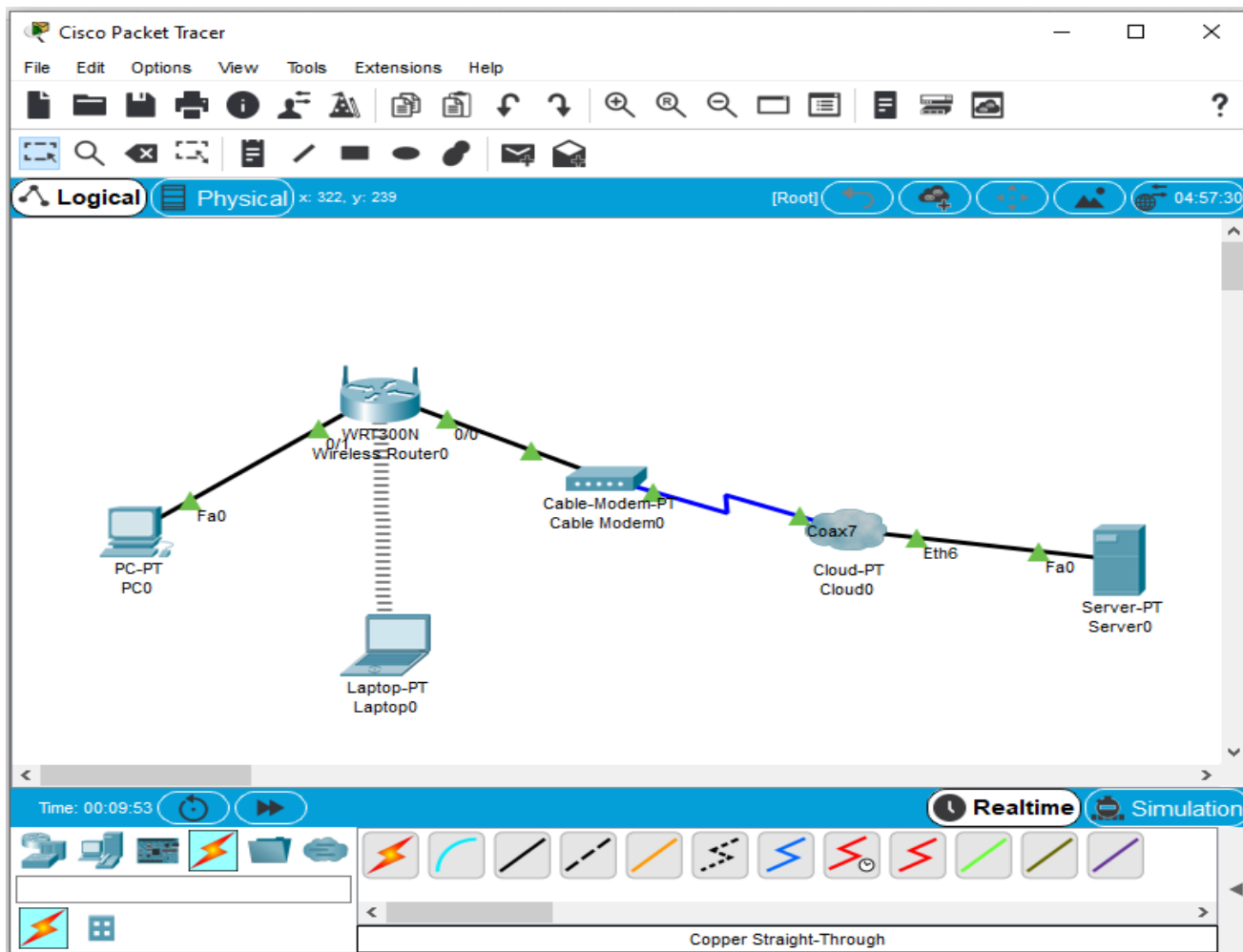
```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

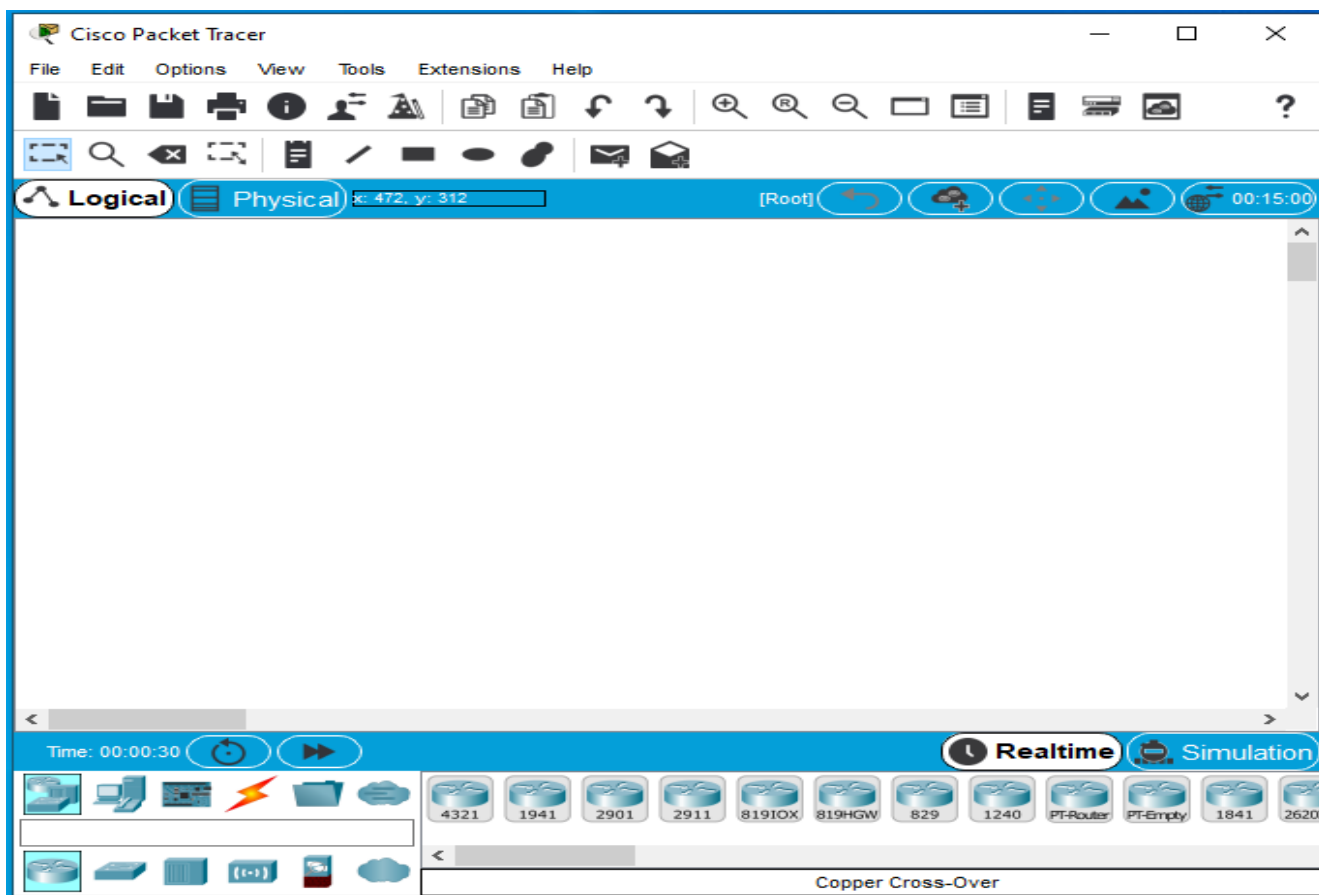
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

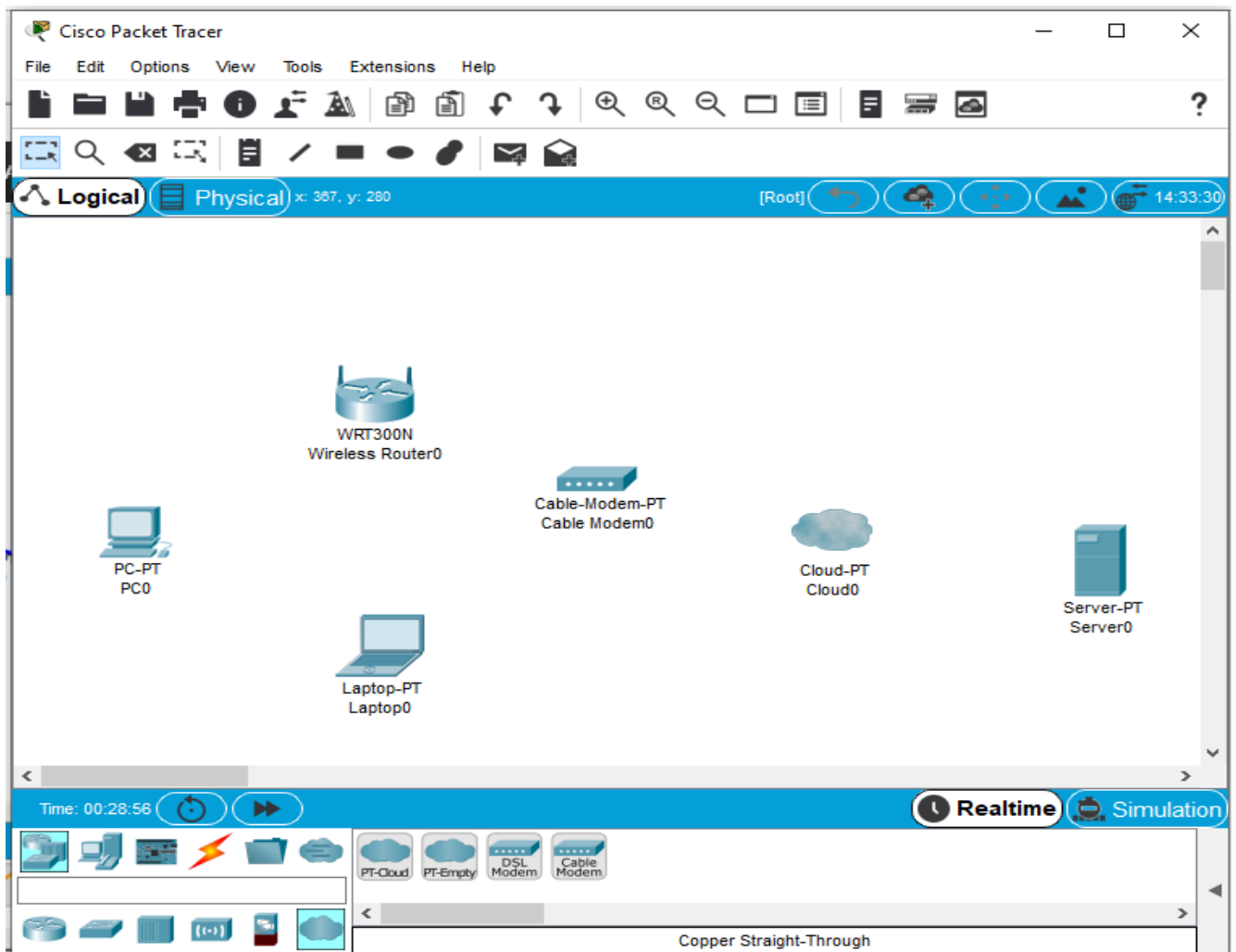
## 11. Create a Simple Network



1. Open the Cisco Packet Tracer



2. Select a device to place in the workspace as in the picture.



It consists of the following devices:

**End Devices group**

- a. PC
- b. Laptop
- c. Server

**Wireless Devices group**

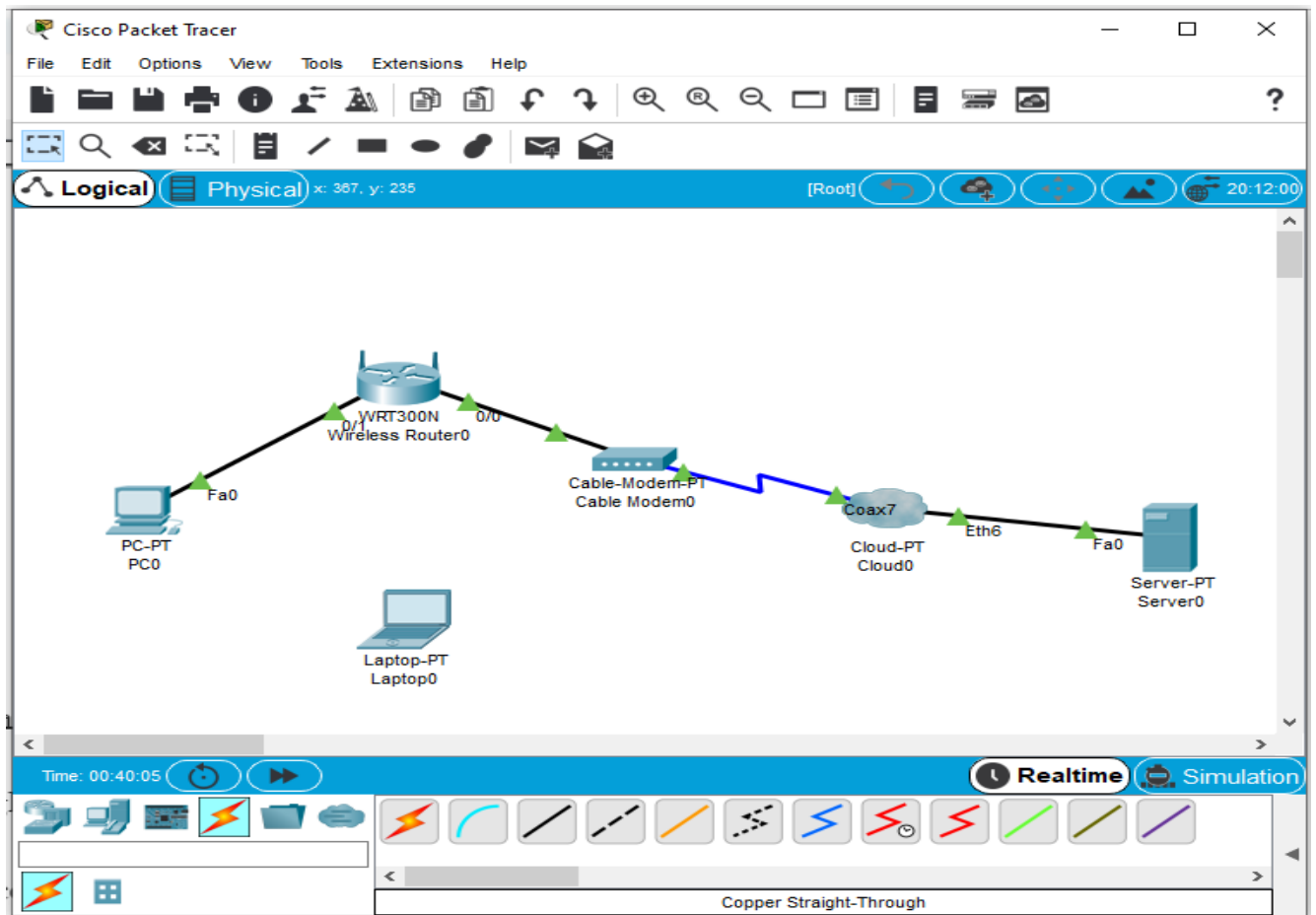
- a. WRT300N

**WAN Emulation group**

- a. Cloud
- b. Cable Modem

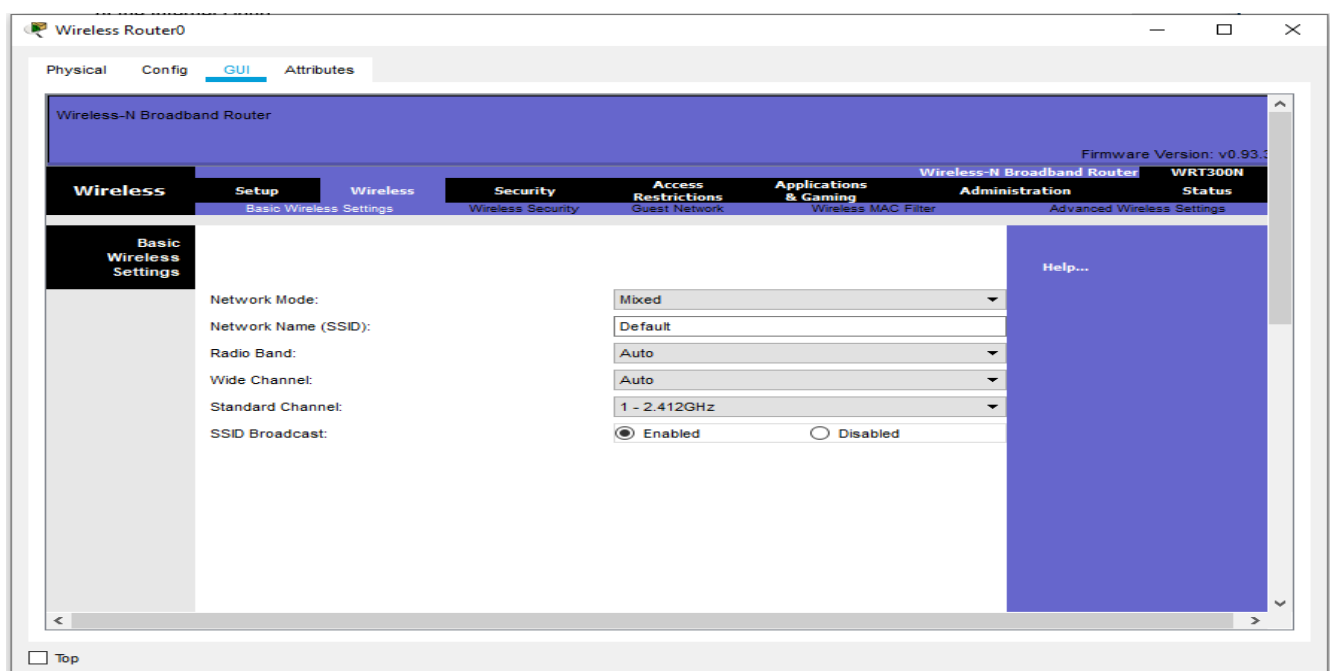
3. Select a signal cable to connect to the device as shown in the figure.

- a. PC0 Connect with copper straight-through to WRT300N's Ethernet port 1
- b. WRT300N Connect Internet port with copper straight-through to Port 1 of Cable Modem
- c. Cable Model Connect Port 0 with Coaxial input. With Cloud
- d. Cloud 's Coaxial7 port, connect Ethernet6 port with copper straight-through to Server's FastEthernet0 port.

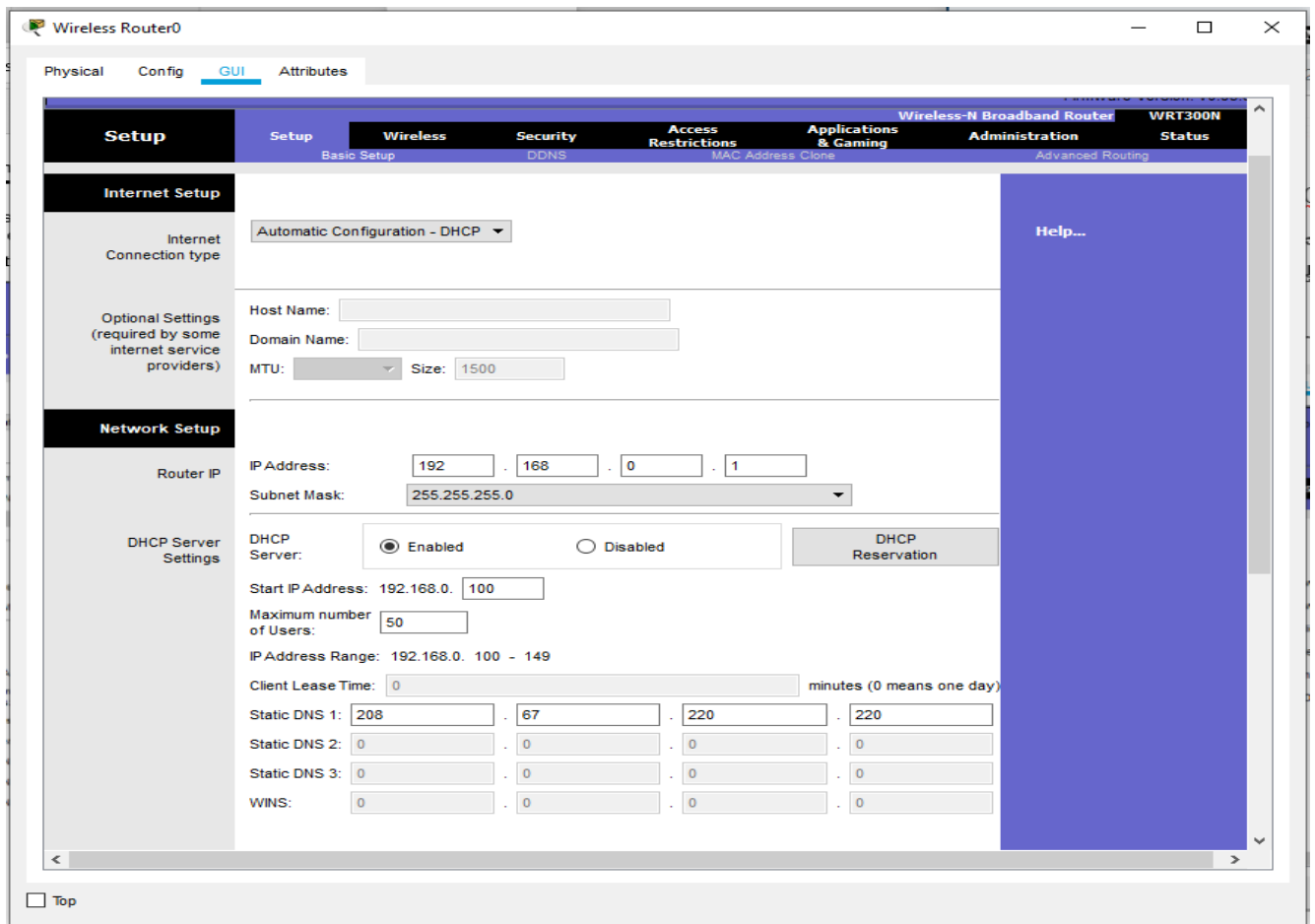


4. Set up WRT300N as follows.

- a. Click the WRT300N
- b. Click the GUI menu bar
- c. Click the Wireless menu bar.



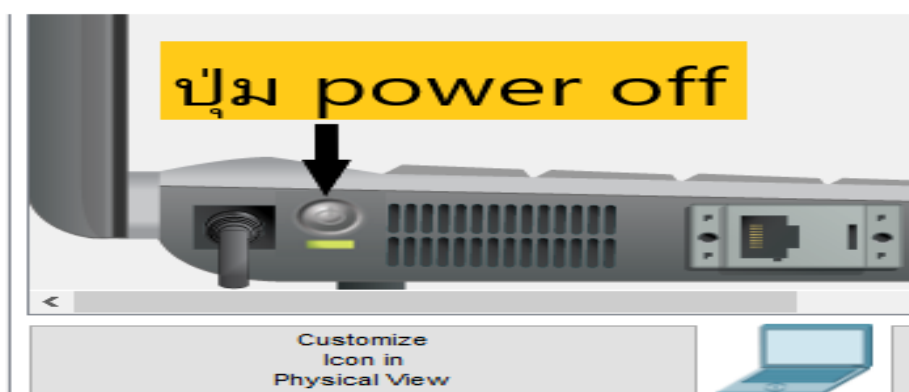
- d. Set Network Name (SSID) to HomeNetwork
- e. Click the Setup menu bar
- f. Select Enable for DHCP Server
- g. Set Static DNS 1 to 208.67.220.220



- h. Click Save Settings at the bottom of the page.

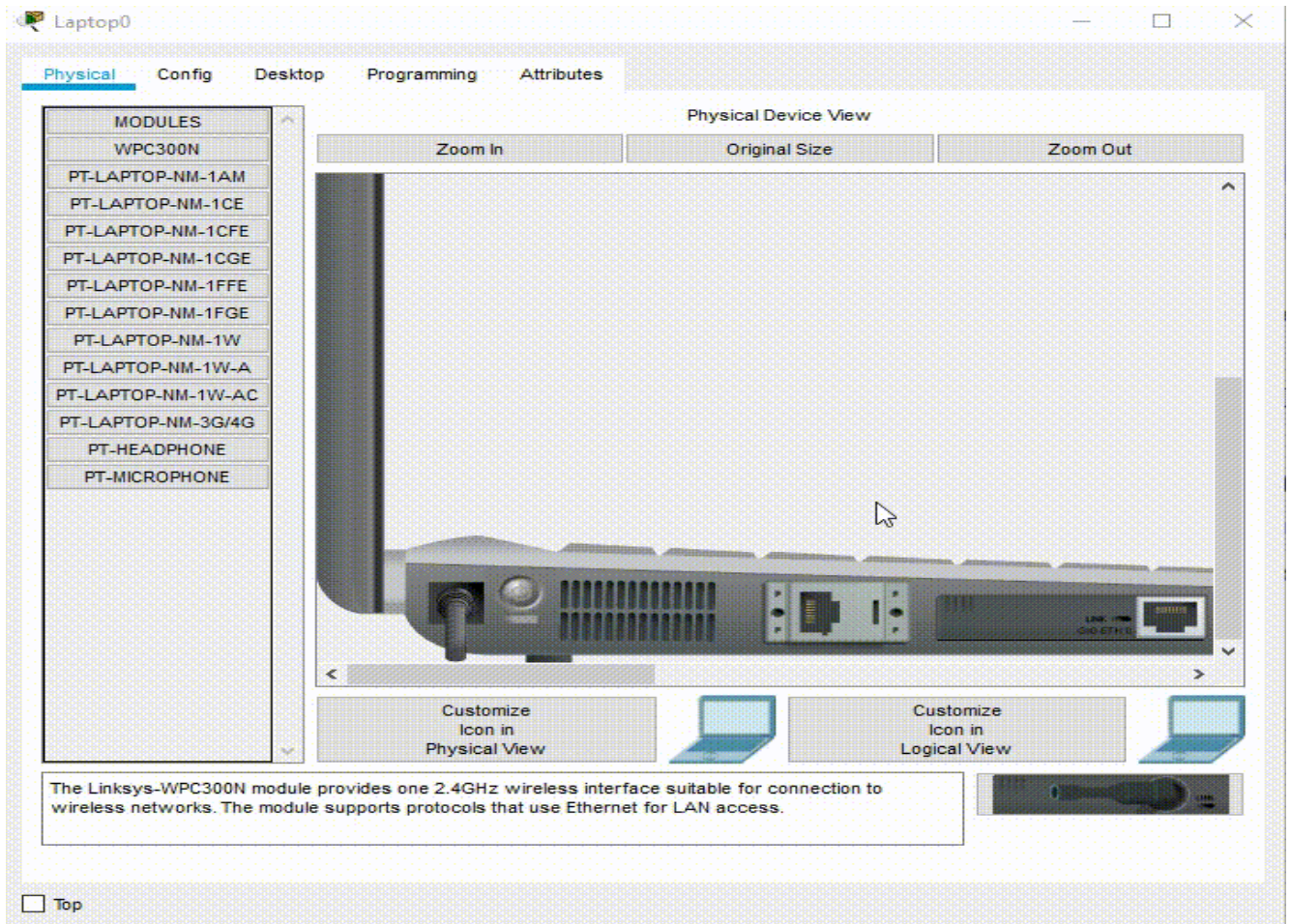
5. Set up Laptop as follows.

- a. Click Laptop
- b. Click Physical menu bar
- c. Turn off laptop by pressing the button in the figure.

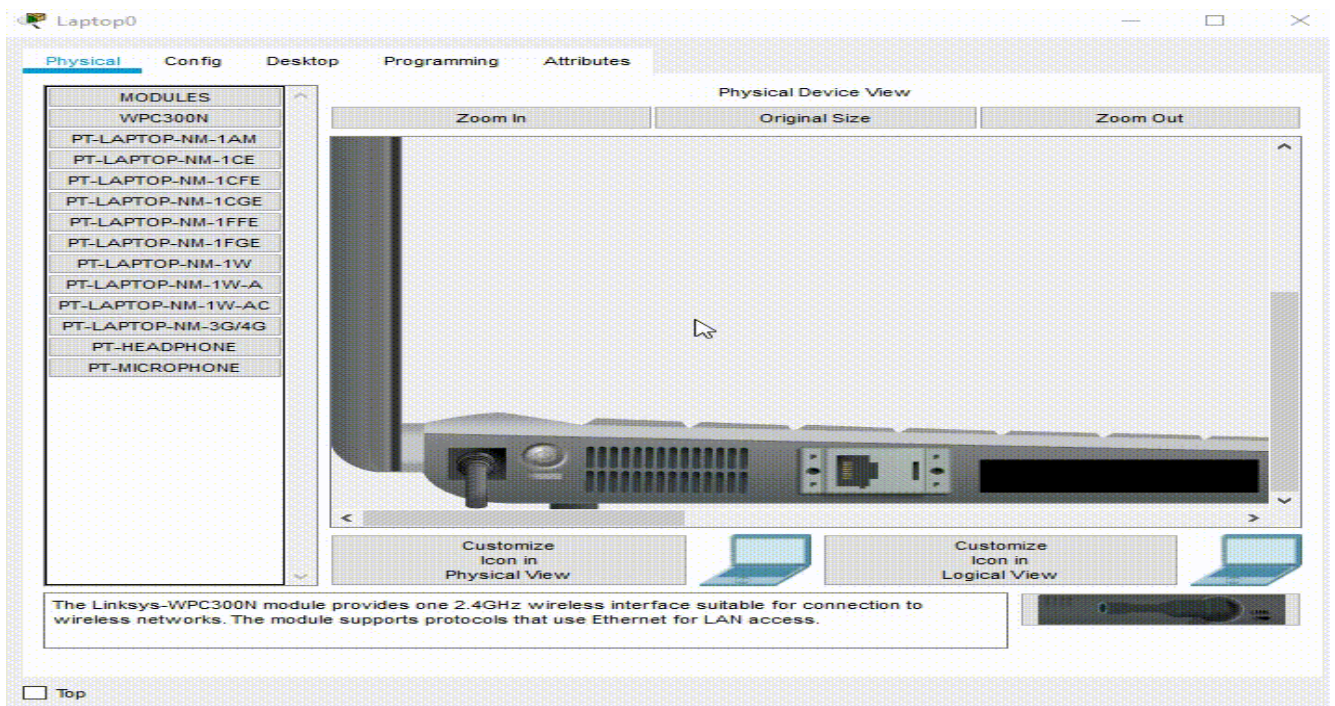




d. Remove the Ethernet module by clicking and dragging and dragging it to the Modules tab.



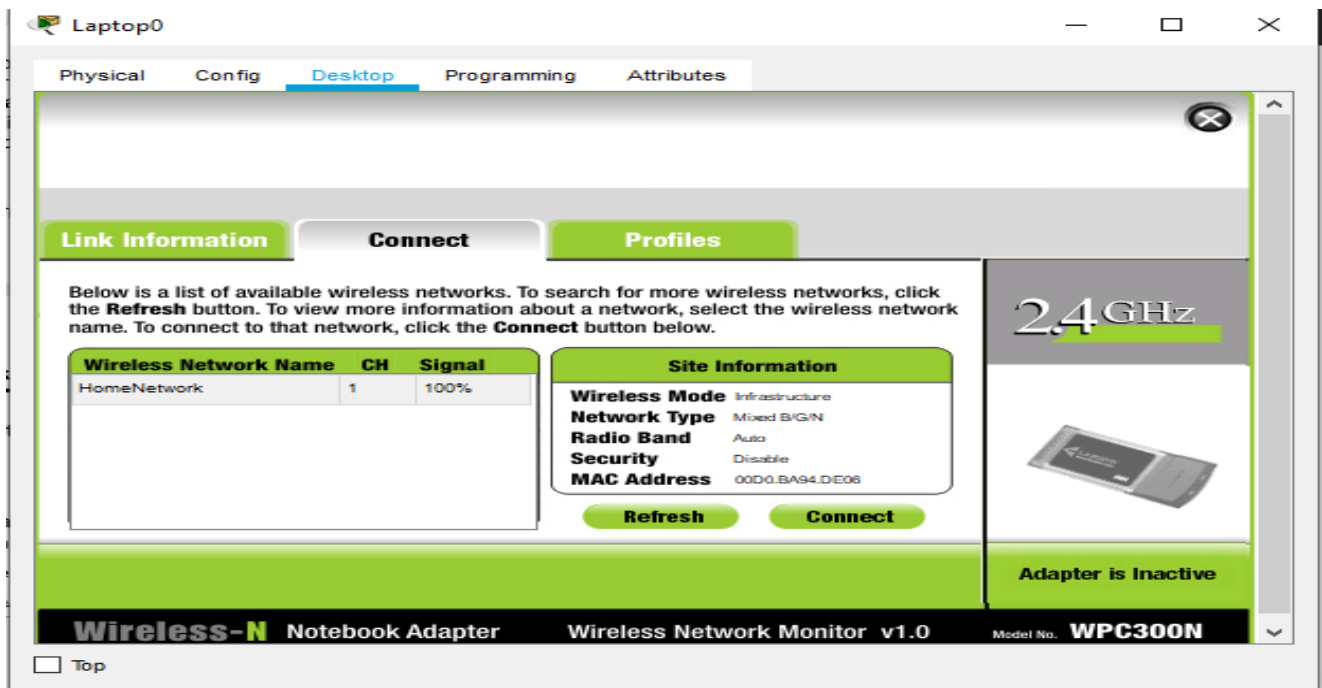
e. Install Module WPC300N into the empty slot and open the laptop again



f. Click on the Desktop menu bar

g. Click the PC Wireless icon

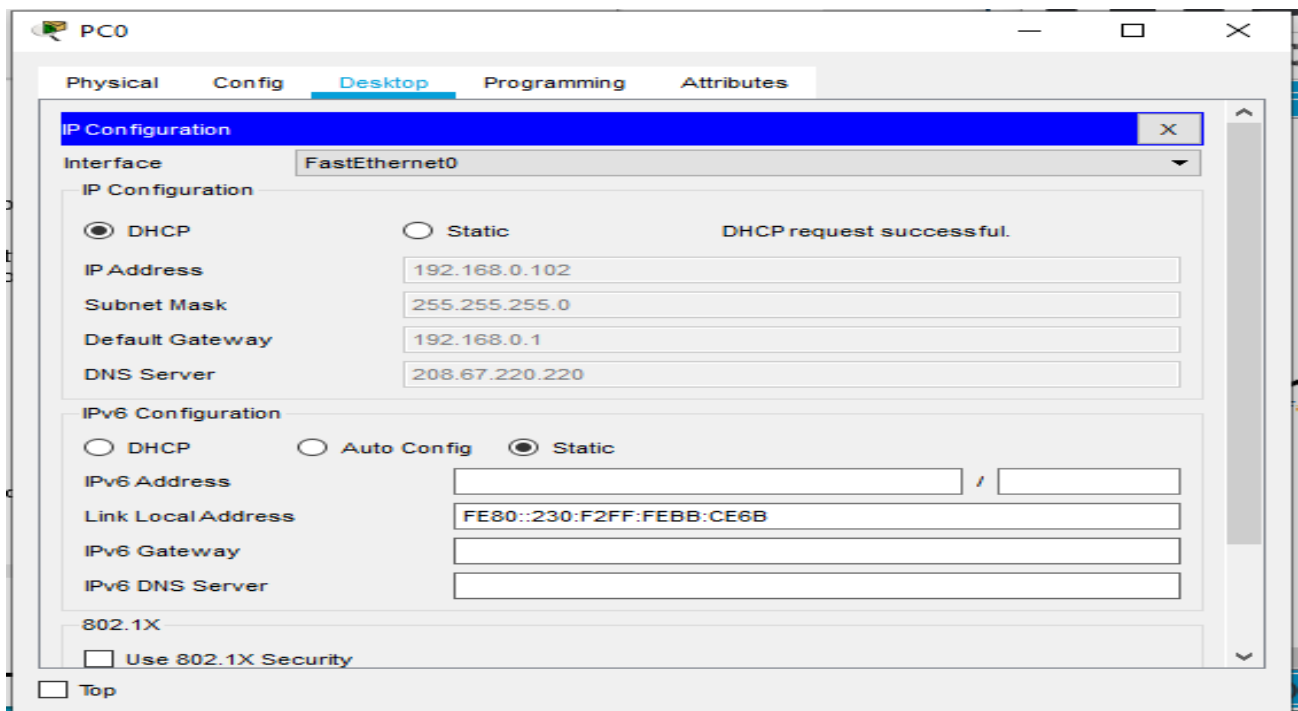
h. Click the Connect menu bar.



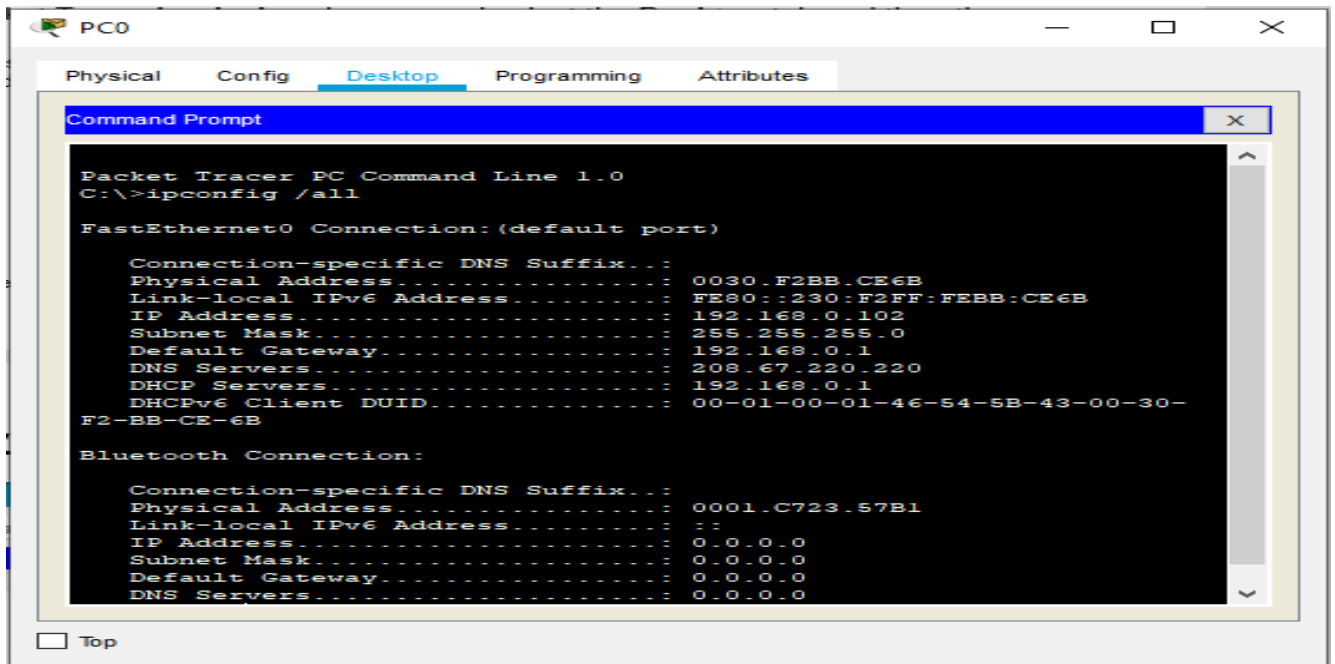
- i. Select HomeNetwork and click Connect under Site Information
- j. Close the settings window.

6. Set up your PC as follows

- a. Click PC
- b. Click the Desktop menu bar
- c. Click the IP Configuration icon
- d. Select DHCP.

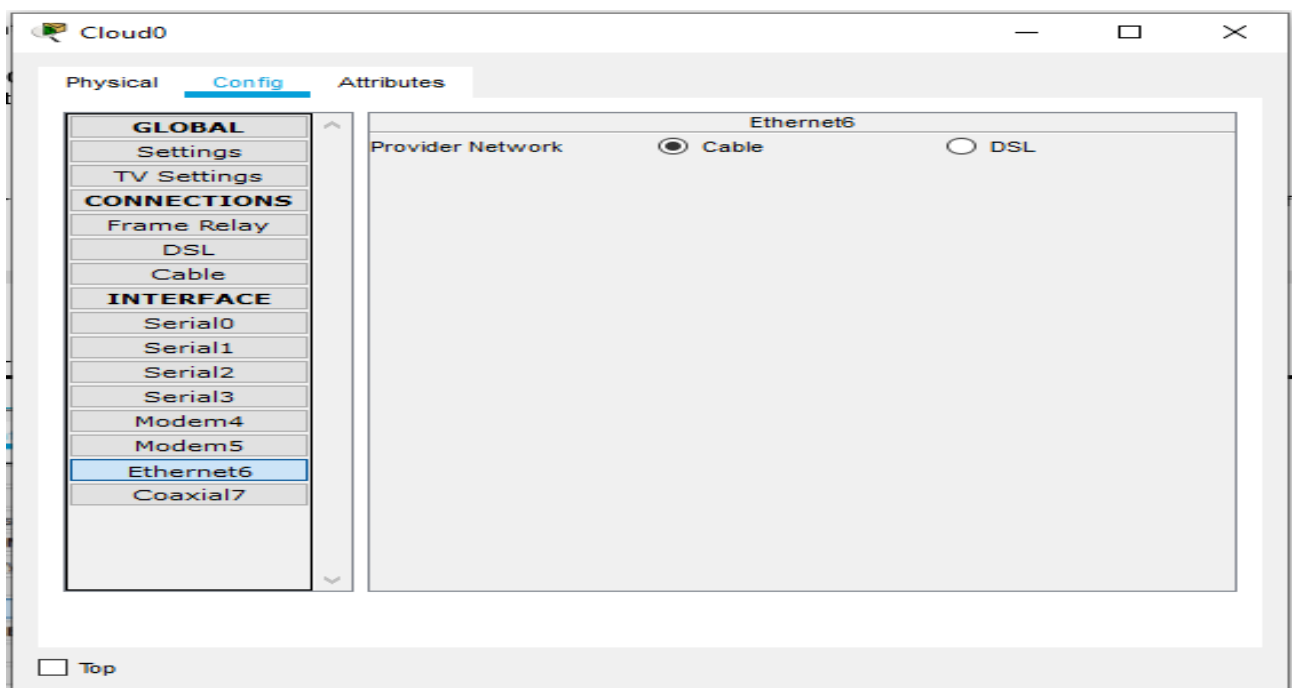


- e. Close the IP Configuration window. Then click the icon of Command Prompt
- f. Check the IP Address received by using the command `ipconfig /all` as shown.



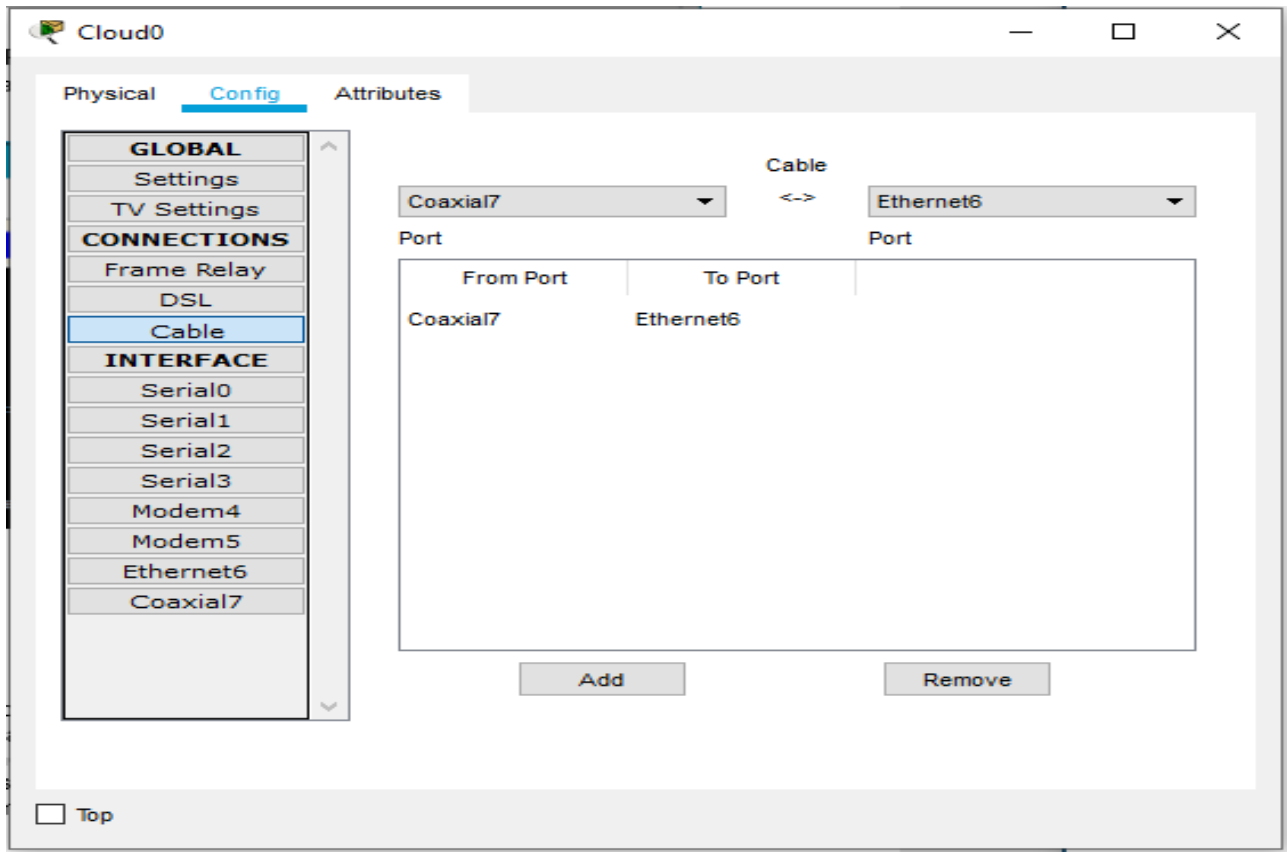
7. Set up the Cloud as follows

- a. Click Cloud
- b. Click the Physical menu bar
- c. Explore the modules PT-CLOUD-NM-1CX and PT-CLOUD-NM-1CFE. Was it already installed? If not yet installed, turn off the device and install the module
- d. Click the menu tab Config and click on the menu Ethernet6
- e. Select Cable

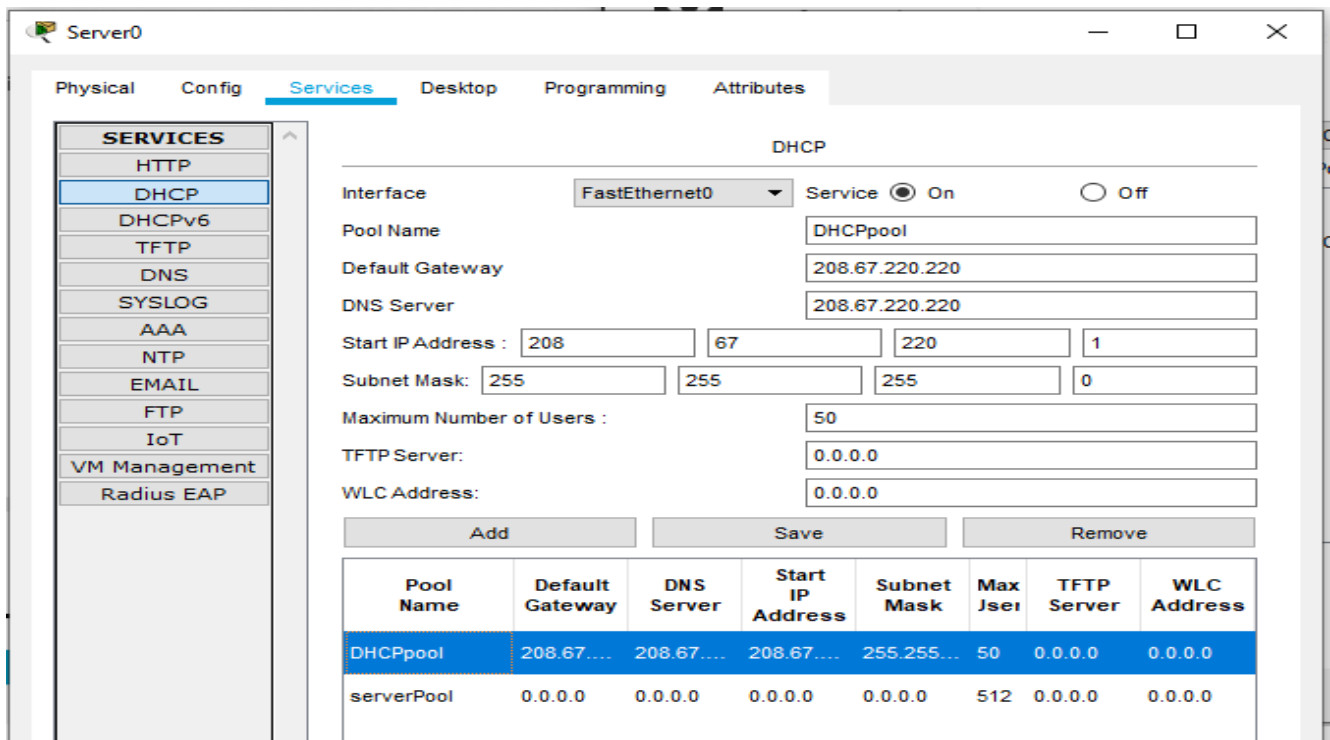




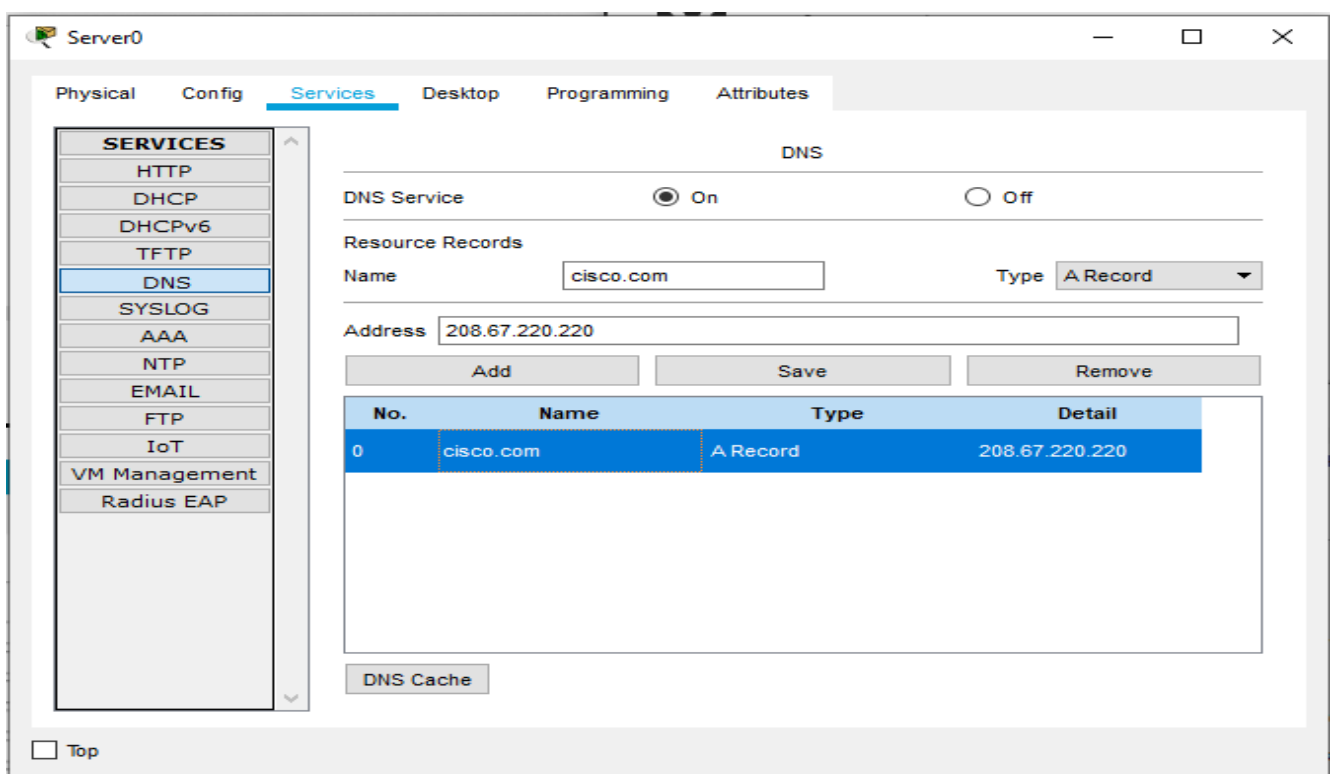
- f. Click the Cable menu
- g. Select Coaxial7 and Ethernet6
- h. Click Add.



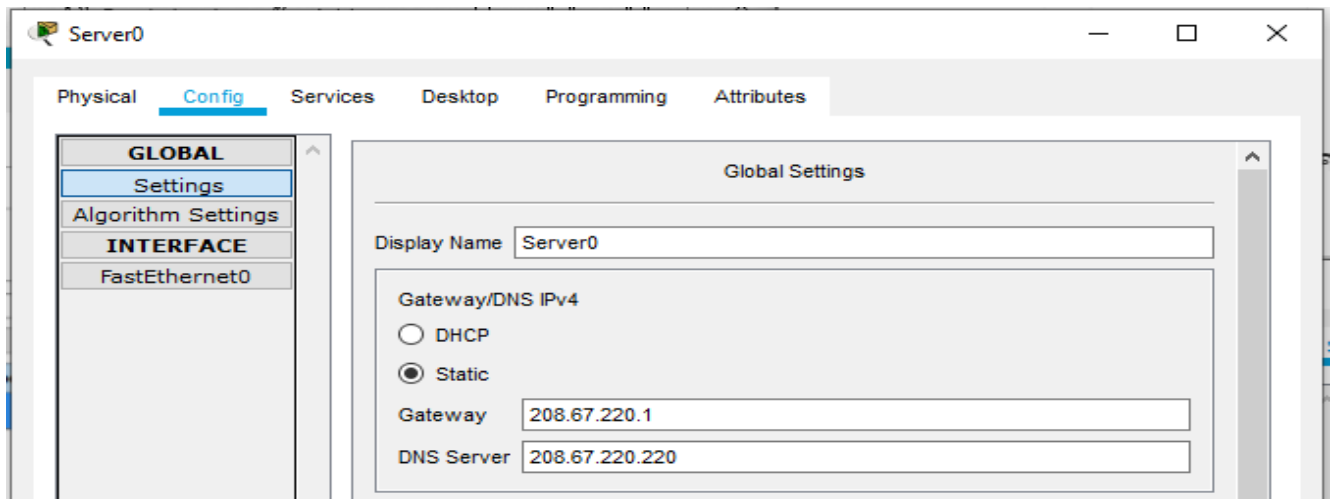
- i. Close the settings window.
8. Set up the server as follows
- a. Click Server
  - b. Click the Services menu bar
  - c. Click the DHCP Menu
  - d. Set as shown in the picture and click Add.



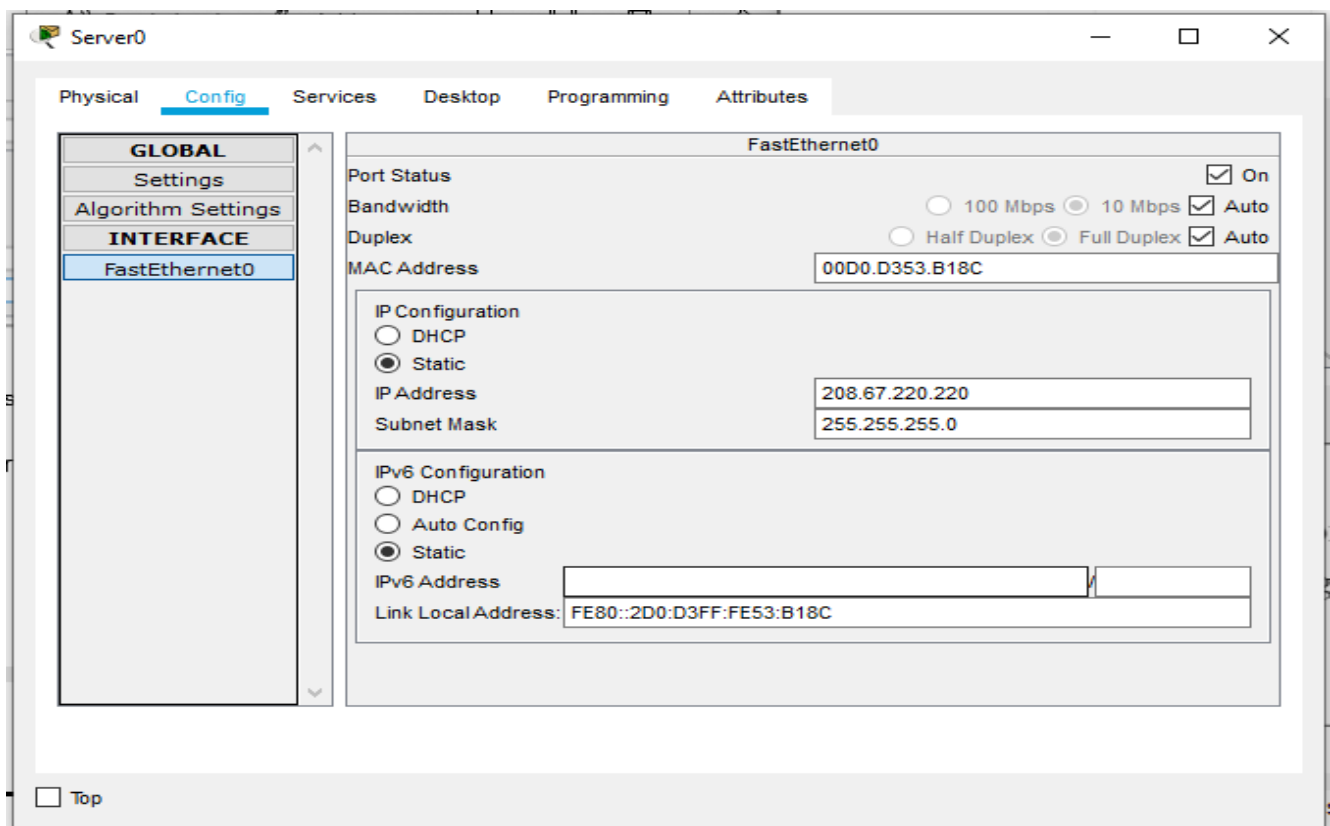
- e. Click DNS menu
- f. Set as shown and click Add.



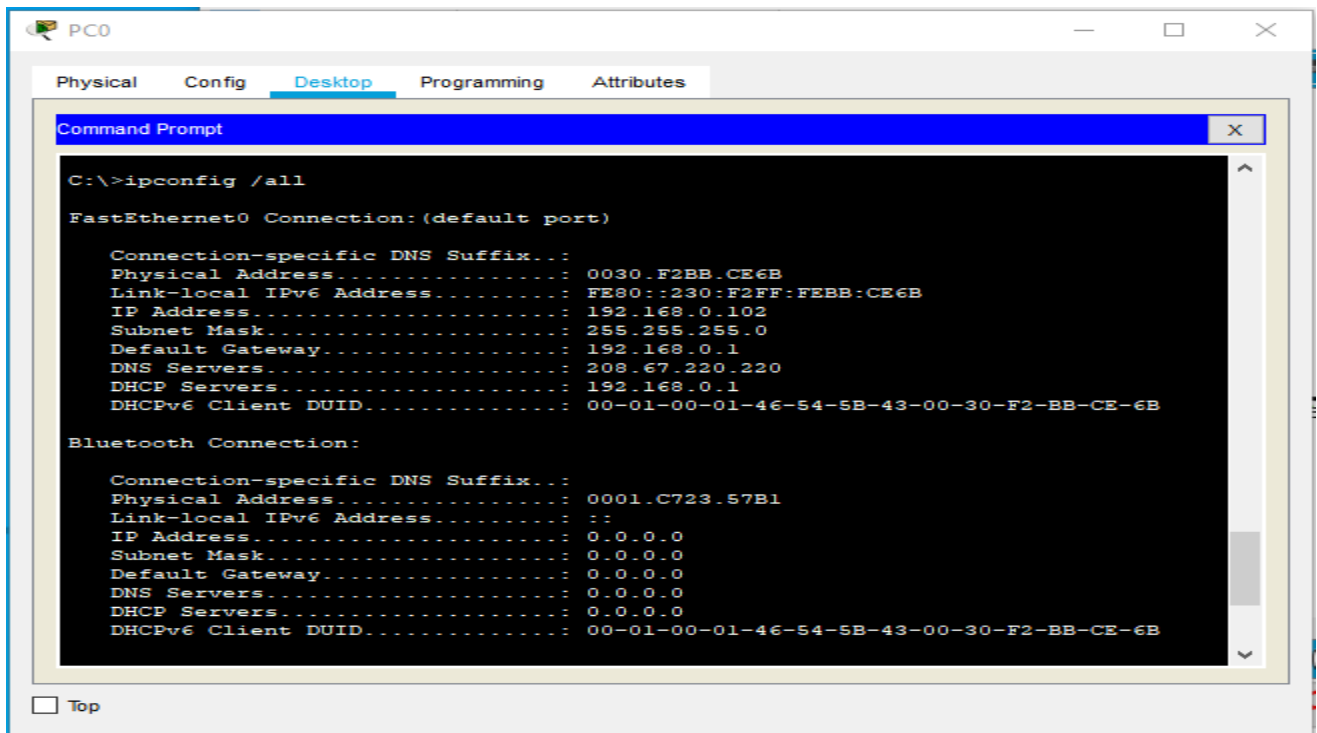
- g. Click the Config menu bar
- h. Click Menu Settings



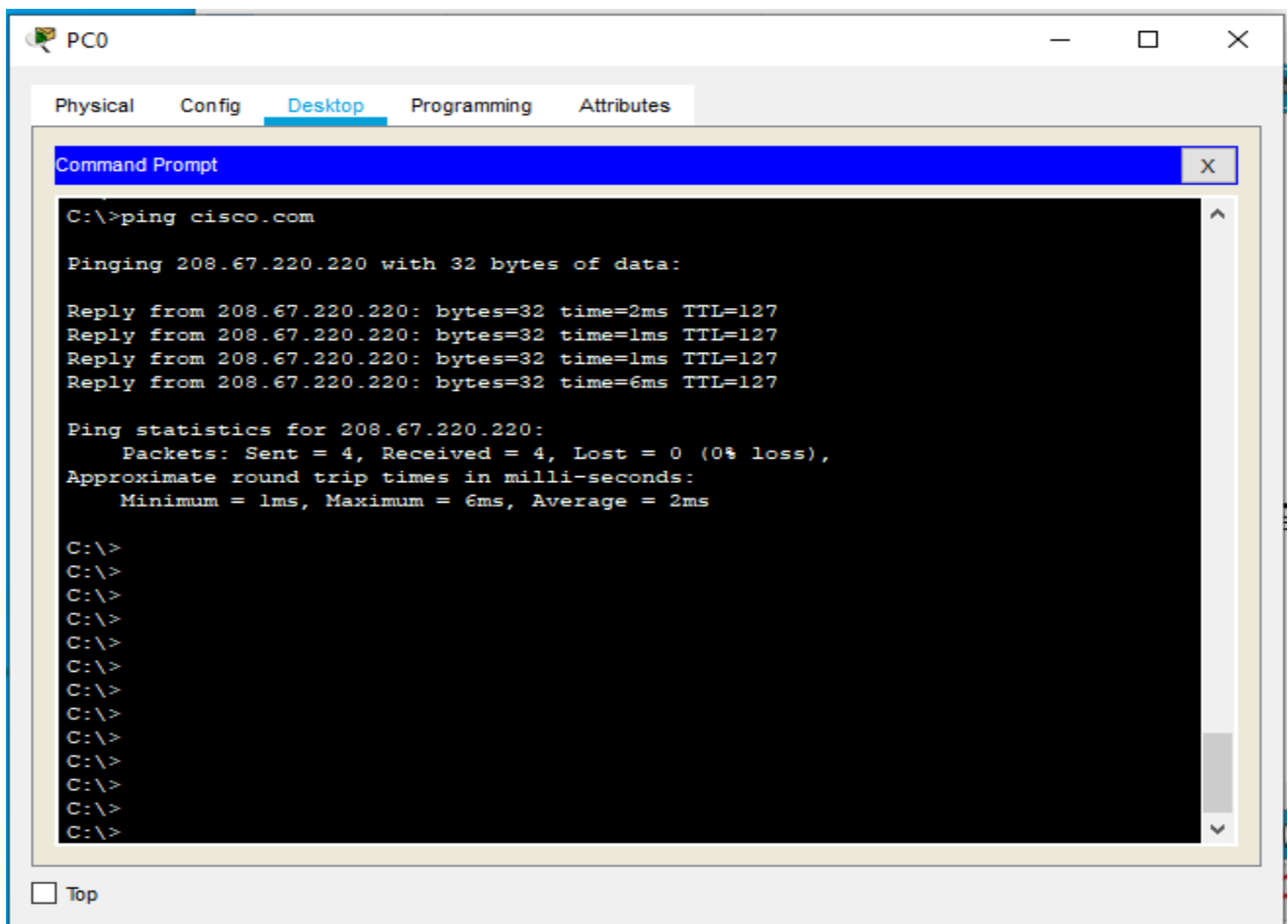
- j. Click Menu FastEthernet0
- k. Set as shown in picture.



- l. Close the settings window.
- 9. Test the connection
  - a. Click PC0
  - b. Click the Desktop menu bar
  - c. Click the Command prompt icon
  - d. Check your IP Address with ipconfig / all.



e. ping test cisco.com



In this article, we learn more about the use of various networking devices.

Packet Tracer, Part 7 Simulation Mode

The screenshot shows the Cisco Packet Tracer interface with a network topology and an Event List panel.

**Network Topology:**

- A central **Wireless Router0** (WRT300N) is connected to a **PC-PT PC0** via its **Fa0** interface.
- The **Wireless Router0** is also connected to a **Laptop-PT Laptop0** via its **0/0** interface.
- The **Wireless Router0** is connected to a **Cable-Modem Cable Modem** via its **0/0** interface.

**Event List Panel:**

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	---	PC0	ICMP
	0.003	PC0	Wireless Router0	ICMP
	0.006	Wireless Router0	Laptop0	ICMP
	0.011	---	Laptop0	ICMP
	0.012	Laptop0	Wireless Router0	ICMP
	0.014	---	Wireless Router0	ICMP
	0.015	Wireless Router0	PC0	ICMP
	0.017	Wireless Router0	Laptop0	ICMP

The interface includes a menu bar (File, Edit, Options, View, Tools, Extensions, Help), a toolbar with various icons, and a status bar at the bottom showing the time (02:09:30.324) and playback controls (PLAY CONTROLS).

**12. This article will introduce the Simulation function as a function for studying the process of receiving - transmitting data of networked devices from the source to the destination. Each step will explain what happened. There are methods of use as follows**

1. Open the lab file that you made in previous part.

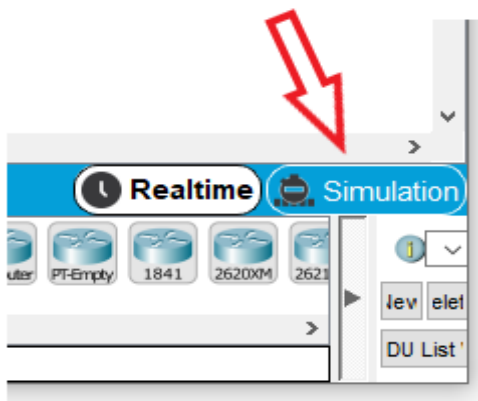
The screenshot shows the Cisco Packet Tracer interface with a more complex network topology.

**Network Topology:**

- A central **Wireless Router0** (WRT300N) is connected to a **PC-PT PC0** via its **Fa0** interface.
- The **Wireless Router0** is also connected to a **Laptop-PT Laptop0** via its **0/0** interface.
- The **Wireless Router0** is connected to a **Cable-Modem-PT Cable Modem0** via its **0/0** interface.
- The **Cable-Modem-PT Cable Modem0** is connected to a **Cloud-PT Cloud0** via its **Coax7** interface.
- The **Cloud-PT Cloud0** is connected to a **Server-PT Server0** via its **Eth6** interface.

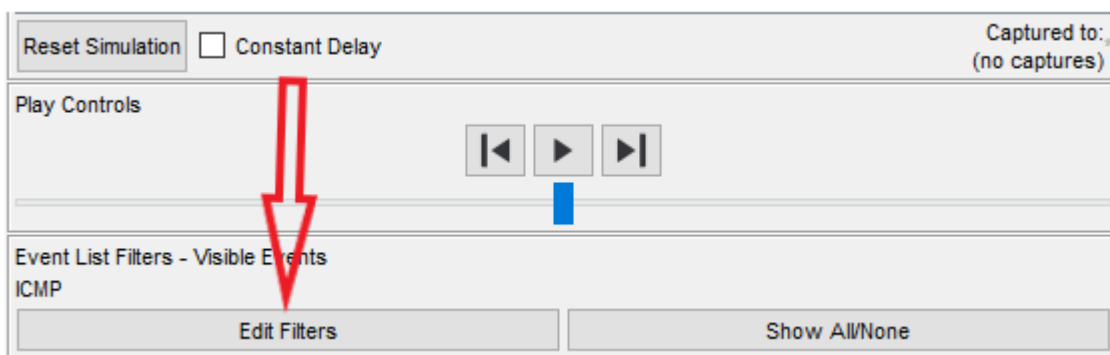
The interface includes a menu bar (File, Edit, Options, View, Tools, Extensions, Help), a toolbar with various icons, and a status bar at the bottom showing the time (02:09:54) and playback controls (PLAY CONTROLS).

2. Click the Simulation menu at the bottom right.

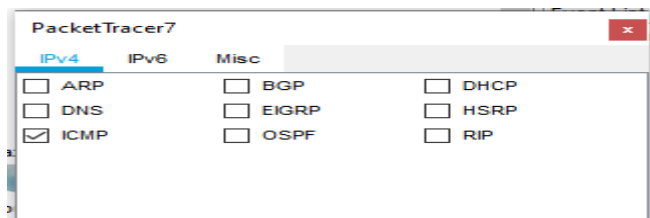


3. Edit filters to select only ICMP.

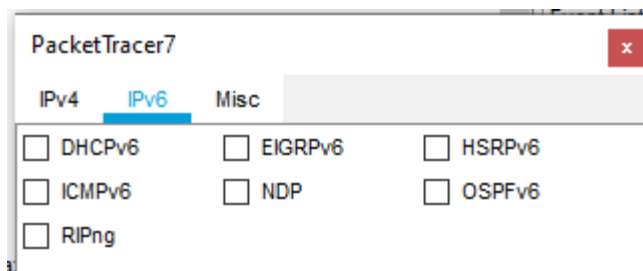
a. Click on Edit Filters.



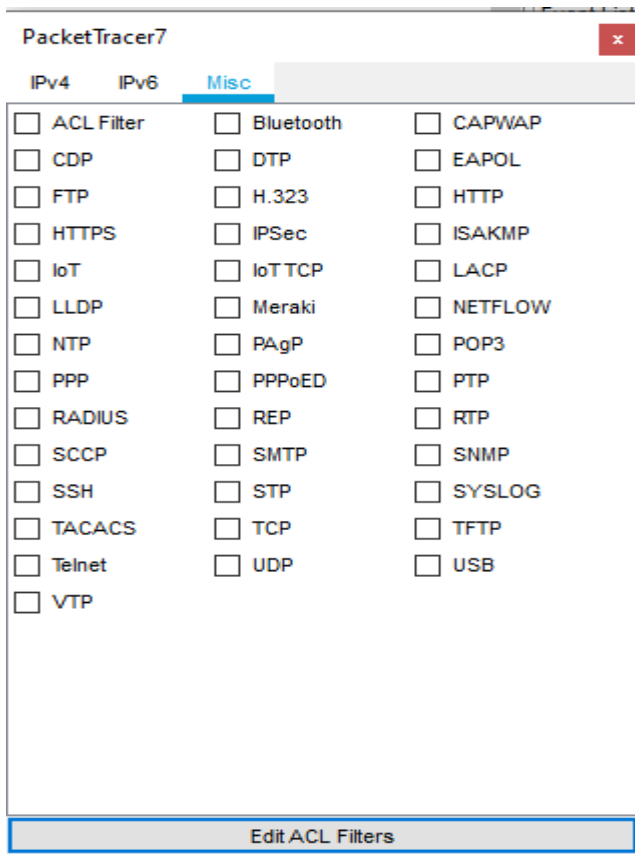
b. At the IPv4 menu, select ICMP only.



c. At the IPv6 menu, leave all blank.



d. At the Misc menu, leave all blank.



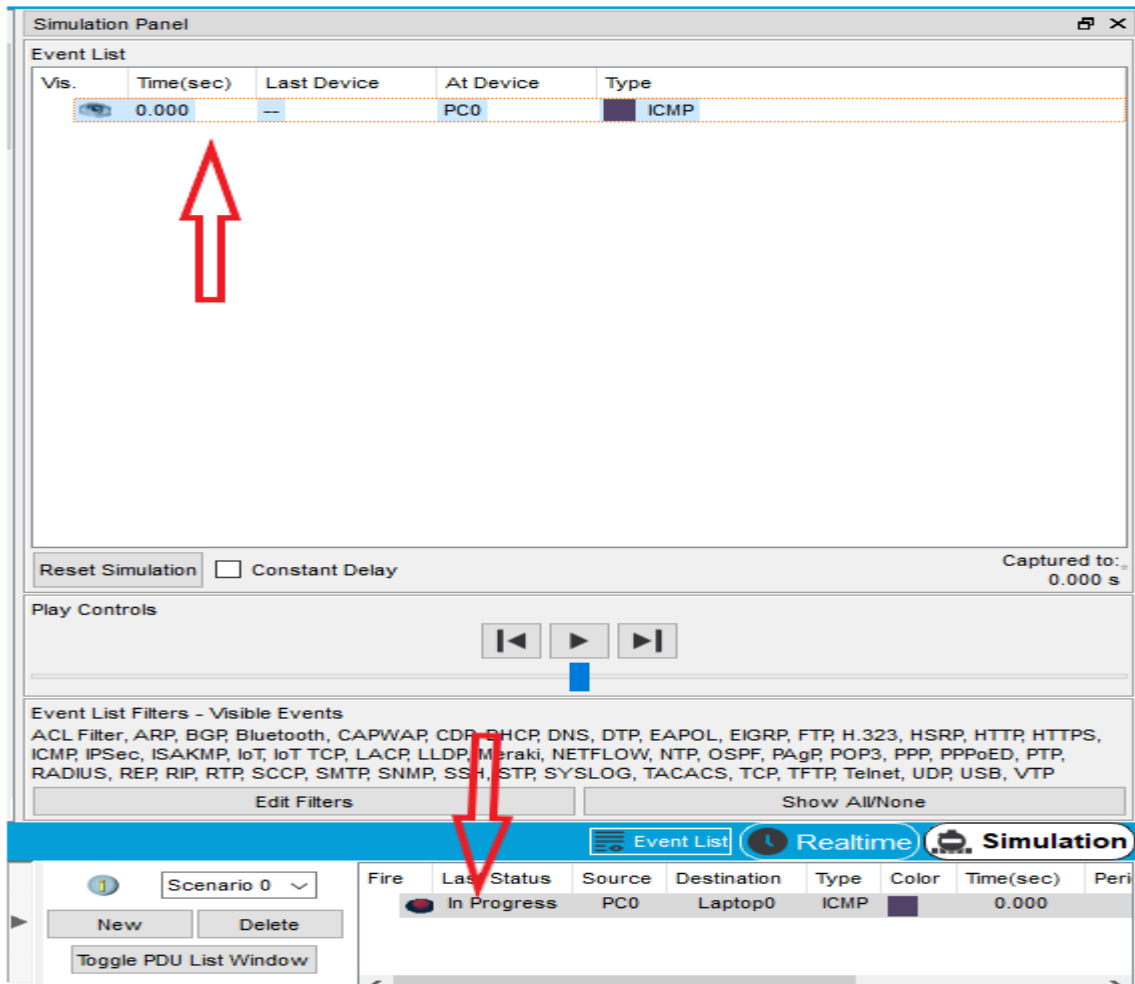
e. Close the window.

4. Test data transmission within the same LAN between PC0 and Laptop0.

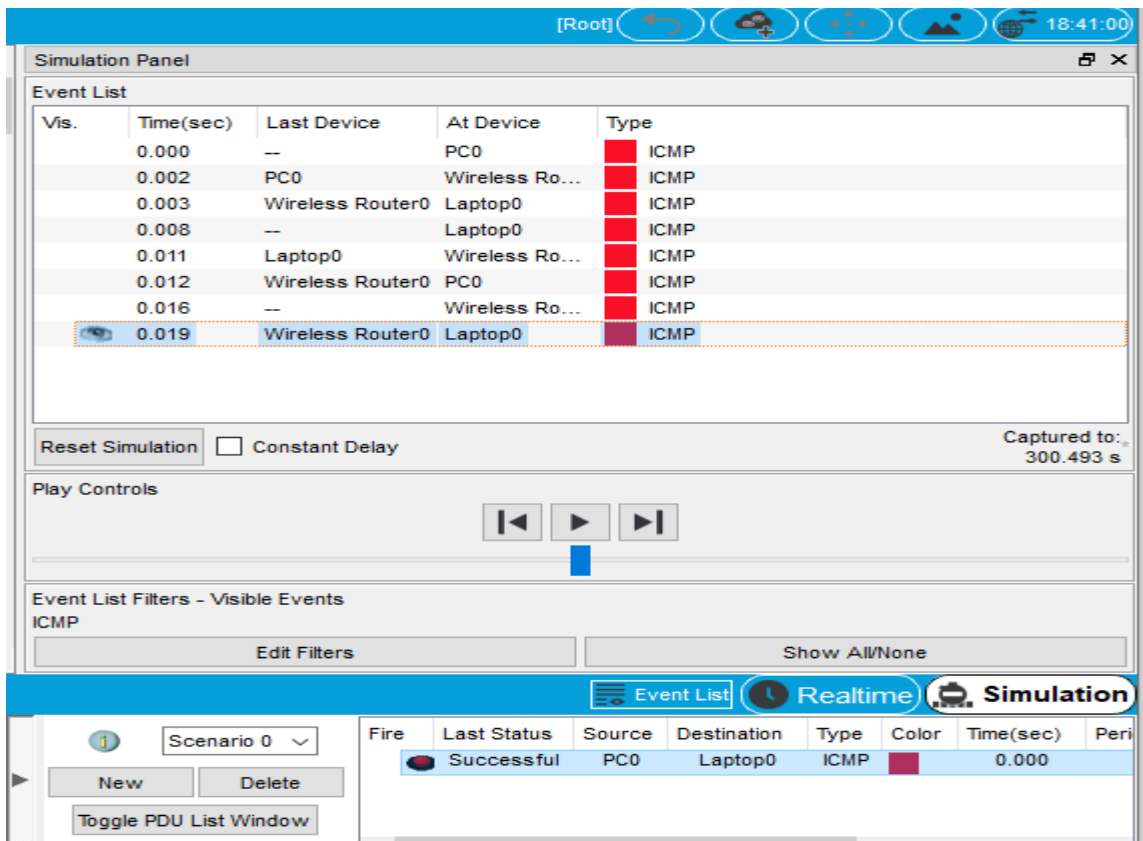
a. Click on the sealed letter image and click on PC0, then click Laptop0.



b. Notice the Simulation panel, an Event list will appear.

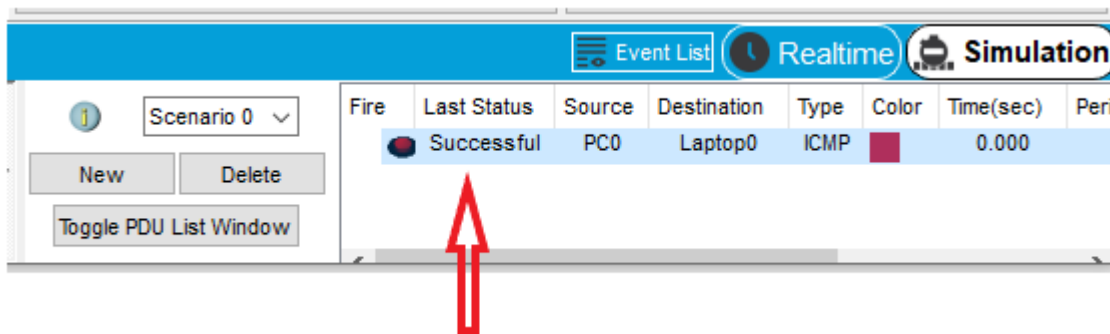


c. Click the play button, observe the movement of the mail from PC0 to Laptop0 and the events that take place in the Simulation panel.





d. When the event shows Successful, click the play button again to stop it.



5. Click to see details of each event that happened.

a.Event 1 takes place at PC0

There will be only the Out Layers section as follows.

### Layer 3

1. The Ping process starts the next ping request.
2. The Ping process creates an ICMP Echo Request message and sends it to the lower process.
3. The source IP address is not specified. The device sets it to the port's IP address.
4. The device sets TTL in the packet header.
5. The destination IP address is in the same subnet. The device sets the next-hop to destination.

### Layer 2

1. The next-hop IP address is a unicast. The ARP process looks it up in the ARP table.
2. The next-hop IP address is in the ARP table. The ARP process sets the frame's destination MAC address to the one found in the table.
3. The device encapsulates the PDU into an Ethernet frame.

### Layer 1

1. FastEthernet0 sends out the frame.

**PDU Information at Device: PC0**

**OSI Model**    Outbound PDU Details

At Device: PC0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer 3: IP Header Src. IP: 192.168.0.101, Dest. IP: 192.168.0.100 ICMP Message Type: 8
Layer2	Layer 2: Ethernet II Header 0030.F2BB.CE6B >> 0060.7072.5897
Layer1	Layer 1: Port(s): FastEthernet0

1. The Ping process starts the next ping request.
2. The Ping process creates an ICMP Echo Request message and sends it to the lower process.
3. The source IP address is not specified. The device sets it to the port's IP address.
4. The device sets TTL in the packet header.
5. The destination IP address is in the same subnet. The device sets the next-hop to destination.

**Challenge Me**    << Previous Layer    Next Layer >>

b.Event 2 takes place at Wireless Router0

In Layers

### Layer 1

1. Ethernet 1 receives the frame.

### Layer 2

1. The frame source MAC address was found in the MAC table of Wireless Router.  
2. This is a unicast frame. Wireless Router looks in its MAC table for the destination MAC address.

Out Layers section

### Layer 2

1. The outgoing port is an access port. Wireless Router sends the frame out that port.

### Layer 1

1. Wireless sends out the frame.

**PDU Information at Device: Wireless Router0**

**OSI Model**    Inbound PDU Details    Outbound PDU Details

At Device: Wireless Router0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer 2: Ethernet II Header 0030.F2BB.CE6B >> 0060.7072.5897	Layer 2: Wireless
Layer 1: Port Ethernet 1	Layer 1: Port(s): Wireless

1. Ethernet 1 receives the frame.

**Challenge Me**    << Previous Layer    Next Layer >>

c.Event 3 takes place at Laptop0.

In Layers

## Layer 1

1. Wireless0 receives the frame.

## Layer 2

1. The frame's destination MAC address matches the receiving port's MAC address, the broadcast address, or a multicast address.
2. The device decapsulates the PDU from the Ethernet frame.

## Layer 3

1. The packet's destination IP address matches the device's IP address or the broadcast address. The device de-encapsulates the packet.
2. The packet is an ICMP packet. The ICMP process processes it.
3. The ICMP process received an Echo Request message.

## Out Layers section

## Layer 3

1. The ICMP process replies to the Echo Request by setting ICMP type to Echo Reply.
2. The ICMP process sends an Echo Reply.
3. The destination IP address is in the same subnet. The device sets the next-hop to destination.

## Layer 2

1. The next-hop IP address is a unicast. The ARP process looks it up in the ARP table.
2. The next-hop IP address is in the ARP table. The ARP process sets the frame's destination MAC address to the one found in the table.
3. The device encapsulates the PDU into an Ethernet frame.

## Layer 1

1. The port Wireless0 is sending another frame at this time. The device buffers the frame to be sent later.

**PDU Information at Device: Laptop0**

OSI Model    Inbound PDU Details    Outbound PDU Details

At Device: Laptop0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer 3: IP Header Src. IP: 192.168.0.101, Dest. IP: 192.168.0.100 ICMP Message Type: 8	Layer 3: IP Header Src. IP: 192.168.0.100, Dest. IP: 192.168.0.101 ICMP Message Type: 0
Layer 2: Wireless	Layer 2: Wireless
Layer 1: Port Wireless0	Layer 1: Port(s):

1. Wireless0 receives the frame.

Challenge Me    << Previous Layer    Next Layer >>

d.Event 4 takes place at Laptop 0.

## Out Layers

### Layer 1

1. The device takes out this frame from the buffer and sends it.
2. Wireless0 sends out the frame.

The screenshot shows the 'PDU Information at Device: Laptop0' window. The 'OSI Model' tab is selected, and the 'Outbound PDU Details' sub-tab is active. The window displays the following information:

At Device: Laptop0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer2	Layer2
Layer1	Layer 1: Port(s): Wireless0

Below the tables, the following steps are listed:

1. The device takes out this frame from the buffer and sends it.
2. Wireless0 sends out the frame.

At the bottom of the window, there are three buttons: 'Challenge Me', '<< Previous Layer', and 'Next Layer >>'.

e.Event 5 takes place at Wireless Router0

## In Layers

### Layer 1

1. Wireless receives the frame.

### Layer 2

1. The frame source MAC address was found in the MAC table of Wireless Router.
2. This is a unicast frame. Wireless Router looks in its MAC table for the destination MAC address.

## Out Layers

### Layer 2

1. The outgoing port is an access port. Wireless Router sends the frame out that port.

### Layer 1

1. The port Wireless is sending another frame at this time. The device buffers the frame to be sent later.
2. Ethernet 1 sends out the frame.

**PDU Information at Device: Wireless Router0**

OSI Model    Inbound PDU Details    Outbound PDU Details

At Device: Wireless Router0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer 2: Wireless	Layer 2: Ethernet II Header 0060.7072.5897 >> 0030.F2BB.CE6B
Layer 1: Port Wireless	Layer 1: Port(s): Ethernet 1

1. Wireless receives the frame.

Challenge Me    << Previous Layer    Next Layer >>

f.Event 6 takes place at PC0.

## In Layers

### Layer 1

1. FastEthernet0 receives the frame.

### Layer 2

1. The frame's destination MAC address matches the receiving port's MAC address, the broadcast address, or a multicast address.
2. The device decapsulates the PDU from the Ethernet frame.

### Layer 3

1. The packet's destination IP address matches the device's IP address or the broadcast address. The device de-encapsulates the packet.
2. The packet is an ICMP packet. The ICMP process processes it.
3. The ICMP process received an Echo Reply message.
4. The Ping process received an Echo Reply message.

**PDU Information at Device: PC0**

OSI Model    Inbound PDU Details    Outbound PDU Details

At Device: PC0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer 3: IP Header Src. IP: 192.168.0.100, Dest. IP: 192.168.0.101 ICMP Message Type: 0	Layer3
Layer 2: Ethernet II Header 0060.7072.5897 >> 0030.F2BB.CE6B	Layer2
Layer 1: Port FastEthernet0	Layer1

1. FastEthernet0 receives the frame.

Challenge Me    << Previous Layer    Next Layer >>

g.Event 7 takes place at Wireless Router0

## Out Layers

### Layer 1

1. The device takes out this frame from the buffer and sends it.
2. Wireless sends out the frame.

**PDU Information at Device: Wireless Router0**

**OSI Model**    Outbound PDU Details

At Device: Wireless Router0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer2	Layer2
Layer1	Layer 1: Port(s): Wireless

1. The device takes out this frame from the buffer and sends it.  
2. Wireless sends out the frame.

Challenge Me    << Previous Layer    Next Layer >>

h.Event 8 takes place at Laptop0.

### In Layers

#### Layer 1

1. Wireless0 receives the frame.

#### Layer 2

1. The frame's destination MAC address does not match the receiving port's MAC address, the broadcast address, or any multicast address. The device drops the frame.

**PDU Information at Device: Laptop0**

**OSI Model**    Inbound PDU Details

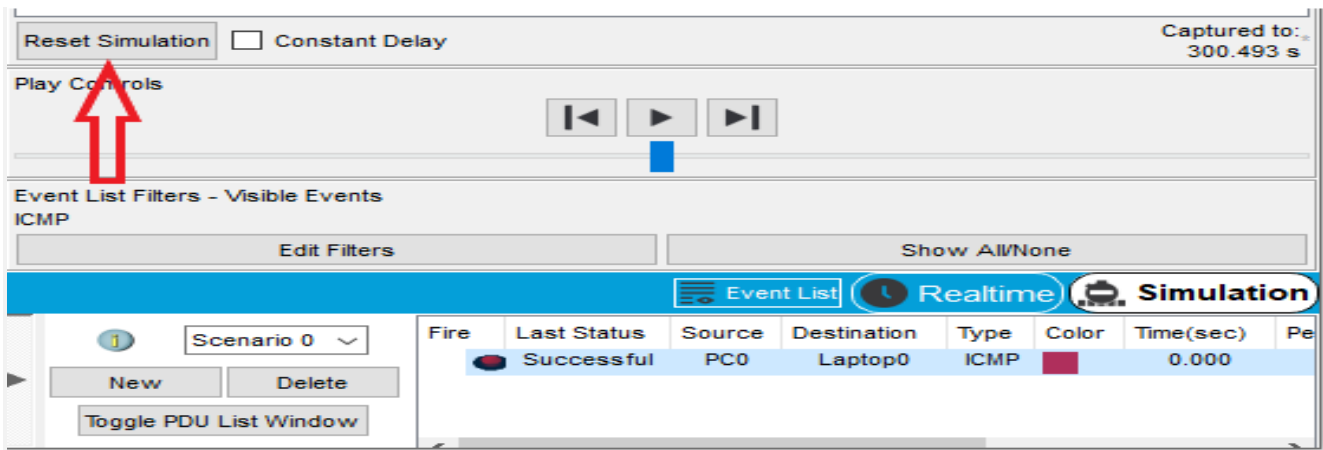
At Device: Laptop0  
Source: PC0  
Destination: Laptop0

In Layers	Out Layers
Layer7	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer 2: Wireless	Layer2
Layer 1: Port Wireless0	Layer1

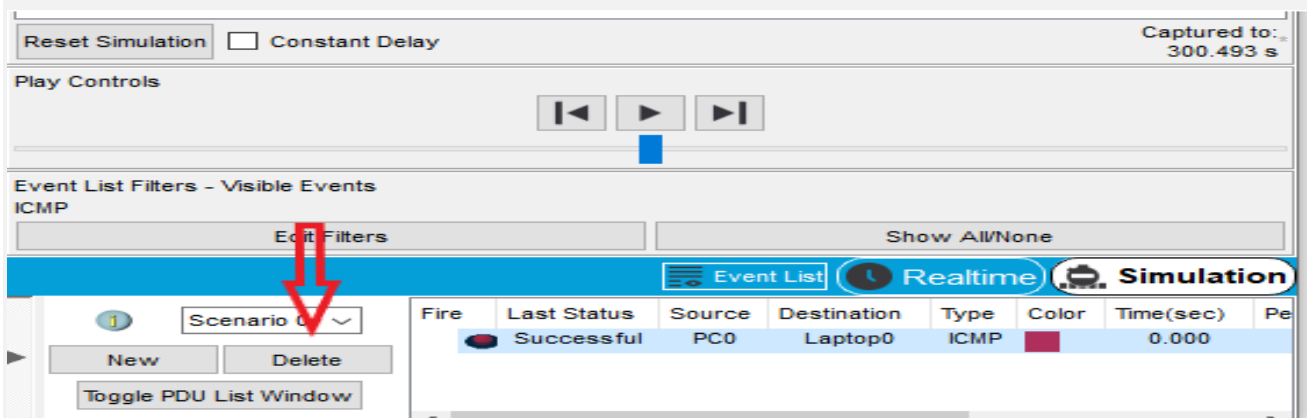
1. Wireless0 receives the frame.

Challenge Me    << Previous Layer    Next Layer >>

6. You can reset the simulation by clicking the Reset Simulate button.



7. You can delete the packet used for testing by clicking on the Delete button.



Readers can test the same way by trying to change the source. And destination to receive information And check the process of receiving - sending that there are different steps What will be the next article in the next chapter? Read it ..... .. Hello.