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Practical 1

Aim: To understand their respective role in networks/internet.

Description:

Networking Glossary:

Before we begin discussing networking with any depth, we must define some common terms that you will see throughout this guide, and in other guides and documentation regarding networking.

These terms will be expanded upon in the appropriate sections that follow:

Connection: In networking, a connection refers to pieces of related information that are transferred through a network. This generally infers that a connection is built before the data transfer (by following the procedures laid out in a protocol) and then is deconstructed at the end of the data transfer.

Packet: A packet is, generally speaking, the most basic unit that is transferred over a network. When communicating over a network, packets are the envelopes that carry your data (in pieces) from one end point to the other. Packets have a header portion that contains information about the packet including the source and destination, timestamps, network hops, etc. The main portion of a packet contains the actual data being transferred. It is sometimes called the body or the payload.

Network Interface: A network interface can refer to any kind of software interface to networking hardware. For instance, if you have two network cards in your computer, you can control and configure each network interface associated with them individually.

LAN: LAN stands for "local area network". It refers to a network or a portion of a network that is not publicly accessible to the greater internet. A home or office network is an example of a LAN.

WAN: WAN stands for "wide area network". It means a network that is much more extensive than a LAN. While WAN is the relevant term to use to describe large, dispersed networks in general, it is usually meant to mean the internet, as a whole. If an interface is said to be connected to the WAN, it is generally assumed that it is reachable through the internet.

Protocol: A protocol is a set of rules and standards that basically define a language that devices can use to communicate. There are a great number of protocols in use extensively in networking, and they are often implemented in different layers. Some low level protocols are TCP, UDP, IP, and ICMP. Some familiar examples of application layer protocols, built on these lower protocols, are HTTP (for accessing web content), SSH, TLS/SSL, and FTP.

Port: A port is an address on a single machine that can be tied to a specific piece of software. It is not a physical interface or location, but it allows your server to be able to communicate using more than one application.

Firewall: A firewall is a program that decides whether traffic coming into a server or going out should be allowed. A firewall usually works by creating rules for which type of traffic is acceptable on which ports. Generally, firewalls block ports that are not used by a specific application on a server.

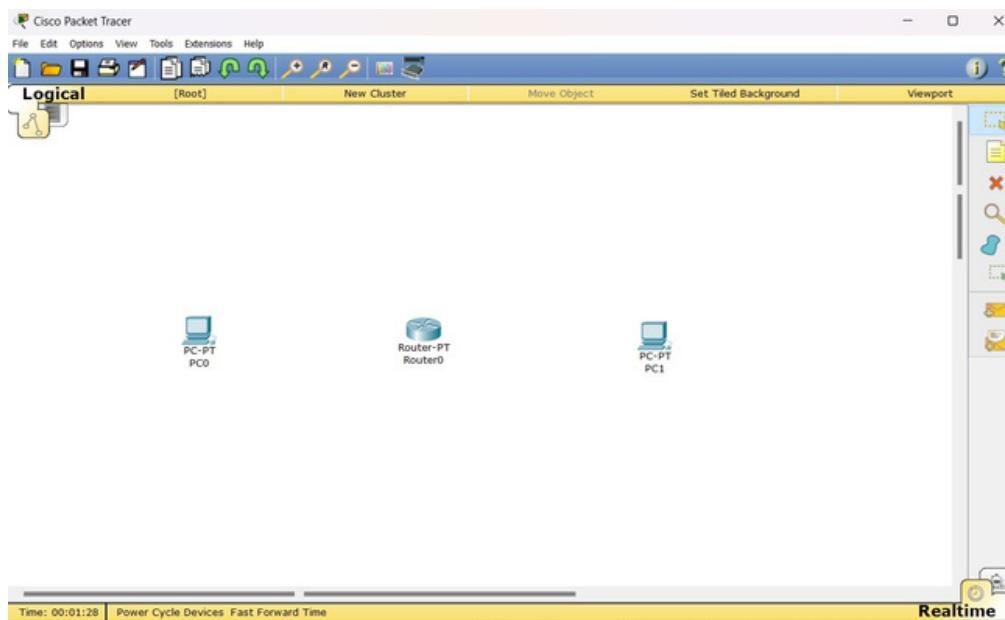
NAT: NAT stands for network address translation. It is a way to translate requests that are incoming into a routing server to the relevant devices or servers that it knows about in the LAN. This is usually implemented in physical LANs as a way to route requests through one IP address to the necessary backend servers.

VPN: VPN stands for virtual private network. It is a means of connecting separate LANs through the internet, while maintaining privacy. This is used as a means of connecting remote systems as if they were on a local network, often for security reasons.

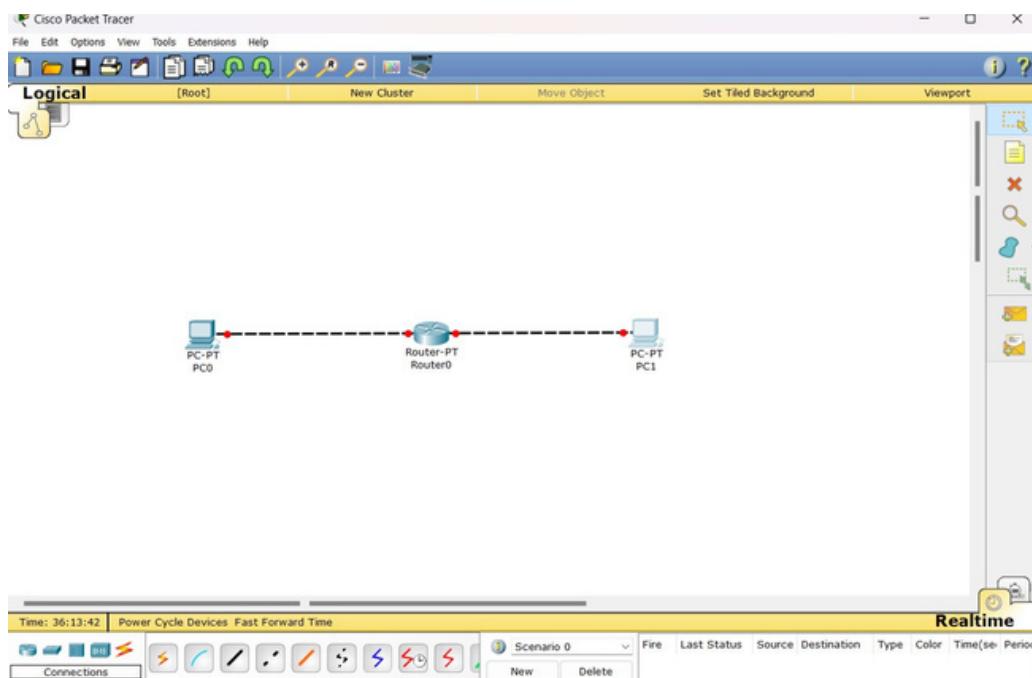
Practical 2

AIM : Using Packet Tracer, create a basic network of two computers using appropriate network wire.

STEP 1: From the left corner of bottom toolbar select "End Devices" and then from the right hand side panel select "PC". Drag and Drop two PC's on the Canvas. From the left corner of bottom toolbar select "Routers" and then from the right hand side panel select "Router-PT" and then drag and drop a router on Canvas. Your Canvas should look as shown in figure below.



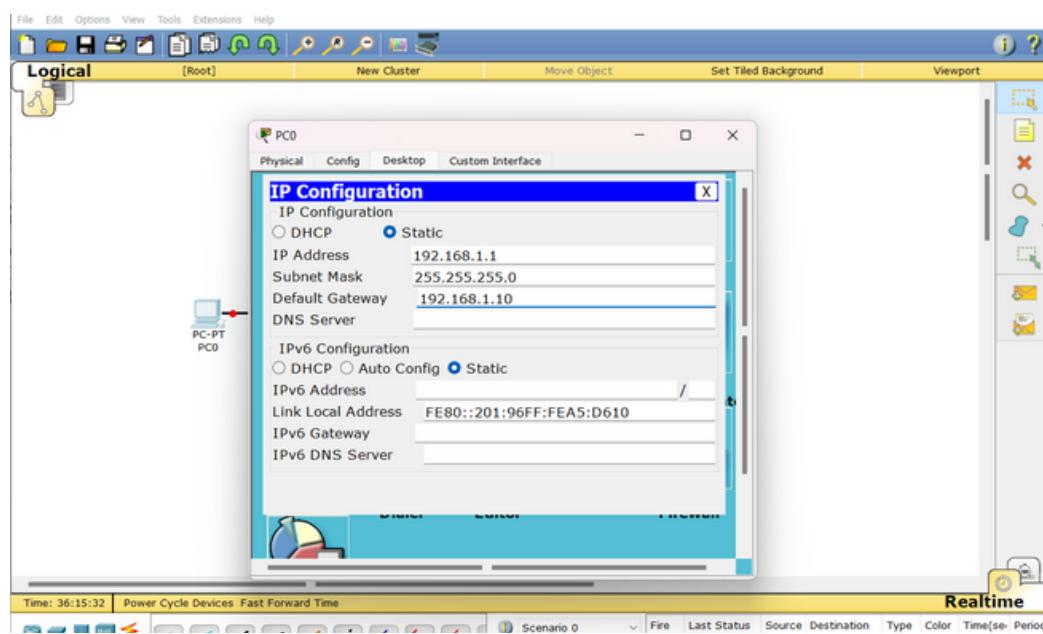
STEP 2: From the left corner of bottom toolbar select "Connections" and then from the right hand side panel select "Copper Cross Over". Connect PC0 to Router) via FastEthernet0/0 and Connect PCI to Router) via FastEthernet1/0. Your Canvas should look as shown in figure below.



STEP 3: Click on PC0>>Desktop>>IP Configuration a window as shown in figure should appear on your screen. Assign IP Address, Subnet Mask, Default Gateway to PC0 and similarly for PC1.

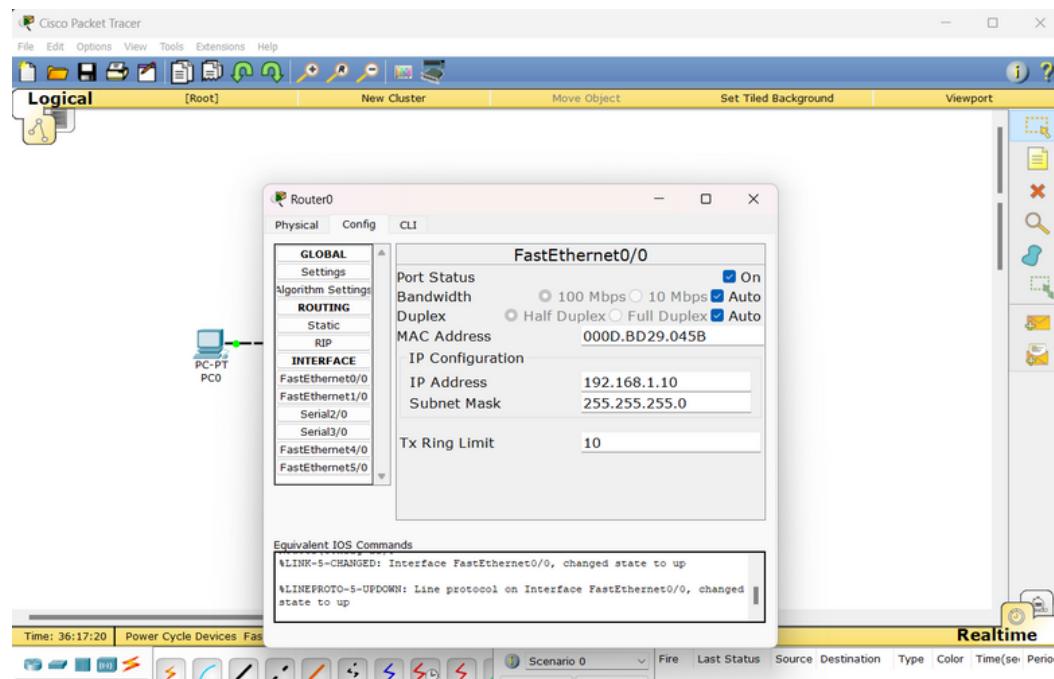
Note: IP Address and Default Gateway of PC's should be different when using Router

Device ID	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.1	255.255.255.0	192.168.1.10
PC1	192.168.1.2	255.255.255.0	192.168.1.10

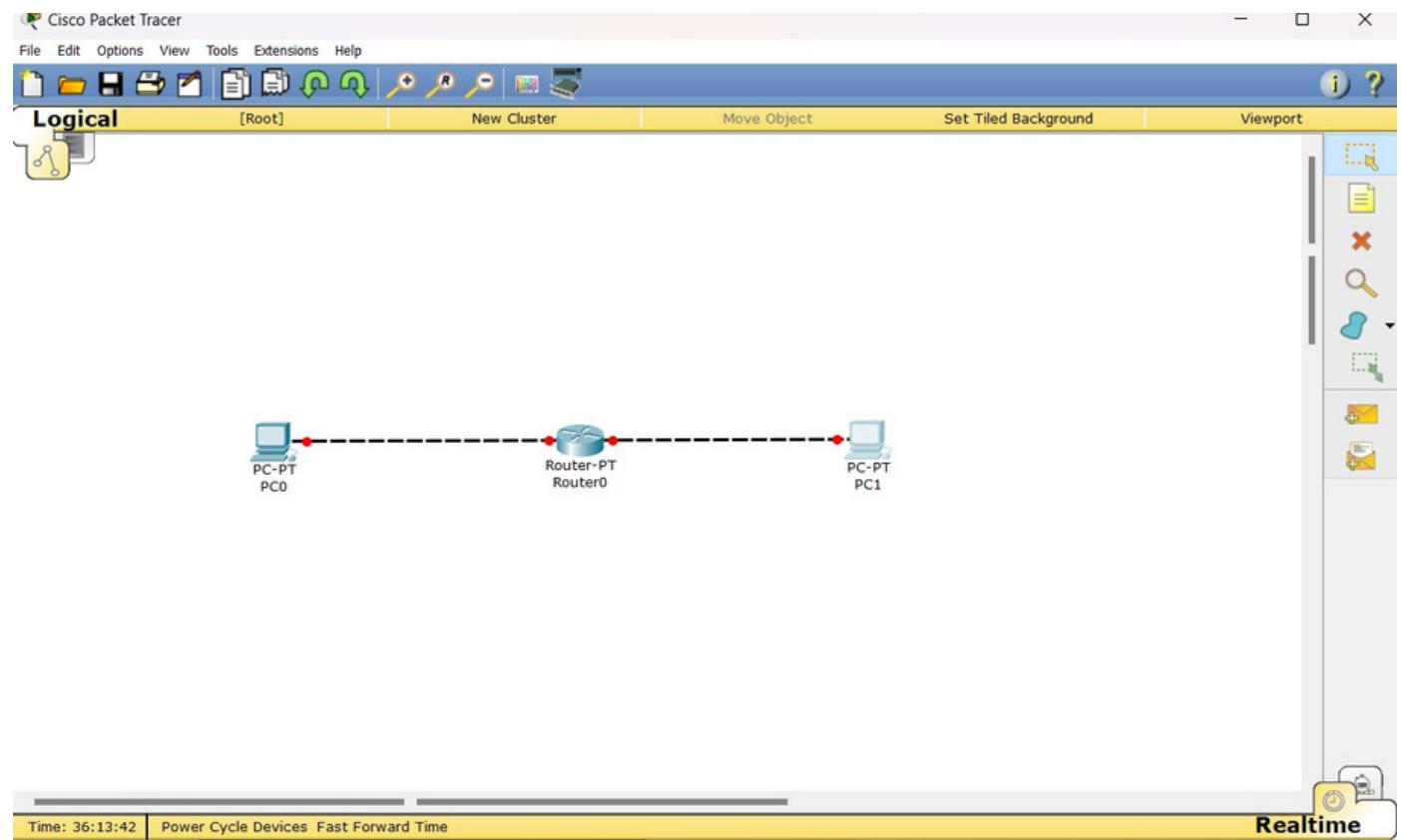


STEP 4: Click on Reuter>>Config>>FastEthernet0/0. Assign Default Gateway of PC0 to IP Address. Click on FastEhternet1/0 and Assign Default Gateway of PCI to IP Address.

Note: Port Status should be ON



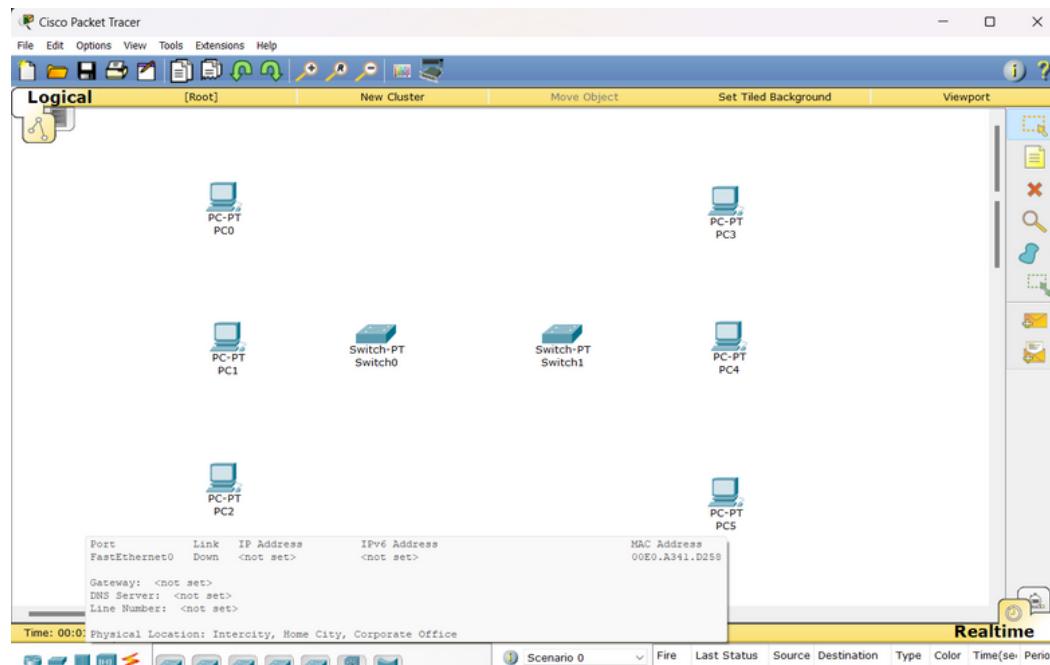
STEP 5: Verify your network by sending messages from one PC to another. From Right hand side toolbar select "Simple Empty PDU". Drop PDU on PC0 and then on PCI and vice versa. In PDU list window, if Last Status is shown as "Successful" then consider that your network is working properly.



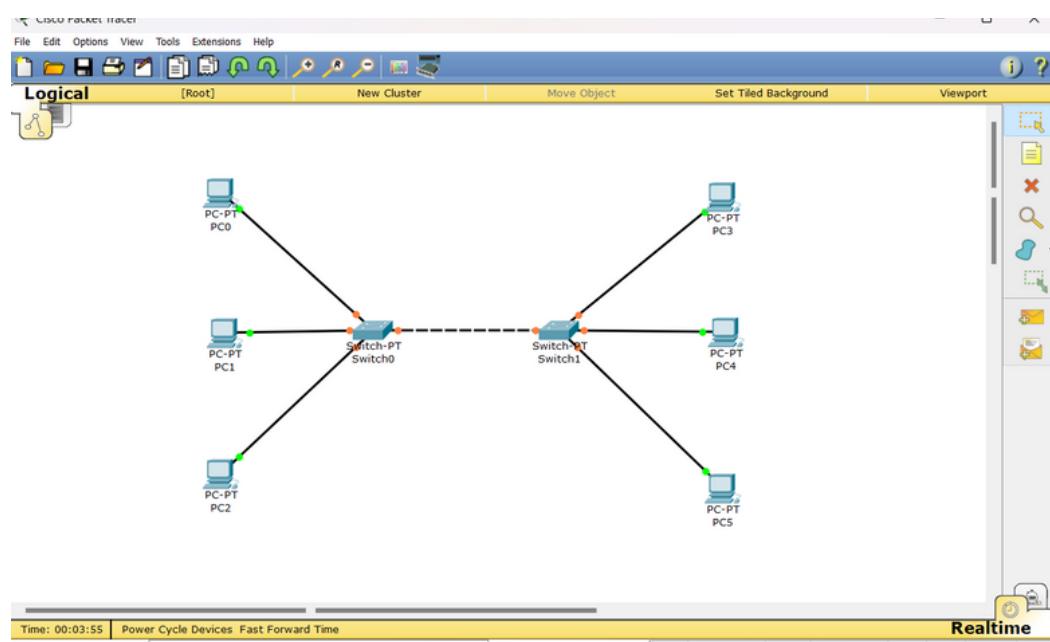
Practical 3

Aim: Using Packet Tracer, connect multiple (min.6) computers using layer 2 switch.

Step 1: From the left corner of bottom toolbar select “End Devices” and then from the right hand side panel select “PC”. Drag and Drop six PC's on the canvas. From the left corner of bottom toolbar select “Switches” and then from the right hand side panel select “Switch- PT” and then drag and drop two Switches(Switch-PT)on Canvas. Your Canvas should look as shown in gure below.



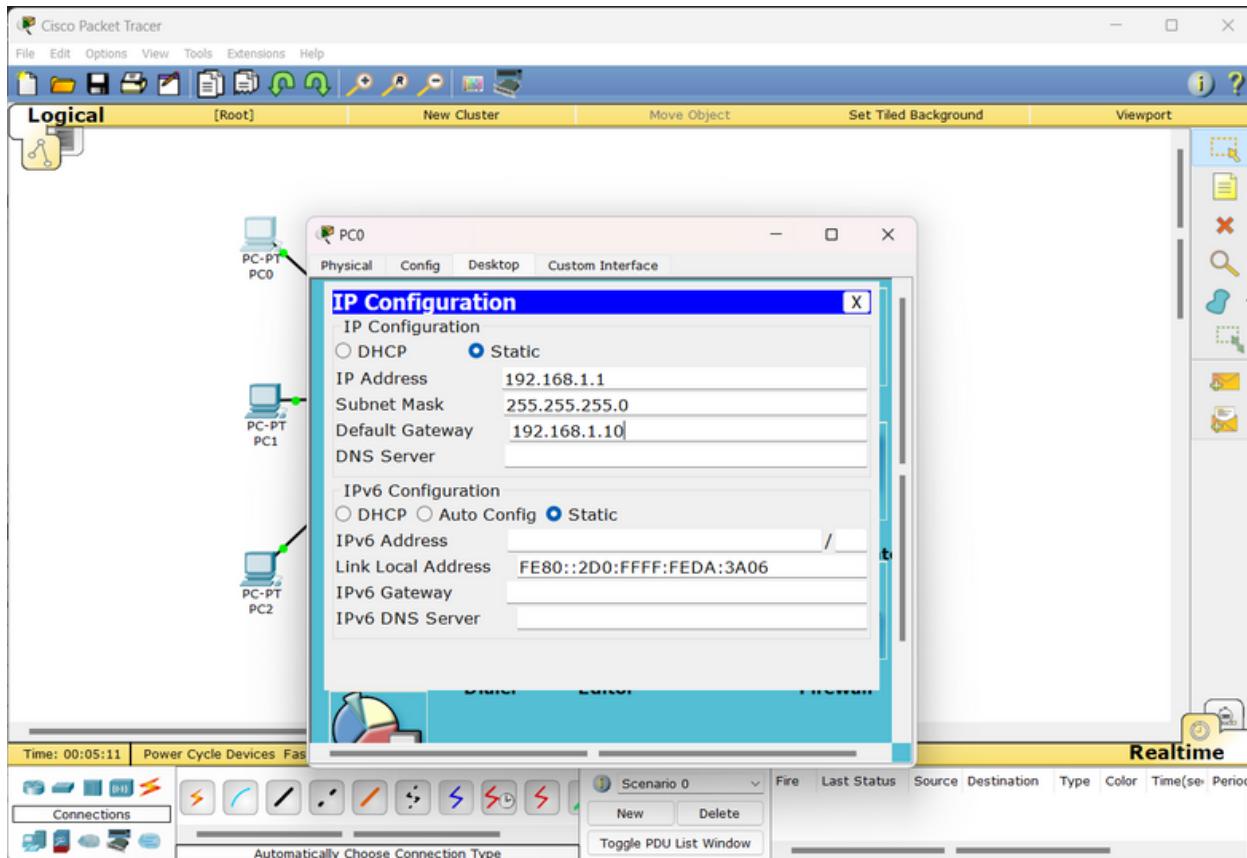
Step 2: From the left corner of bottom toolbar select “Connections” and then from the right hand side panel select “Automatically Choose Connection Type”. Connect PC0, PC1, PC2 to Switch0 and Connect PC3, PC4, PC5 to Switch1. Your Canvas should look as shown in gure below.



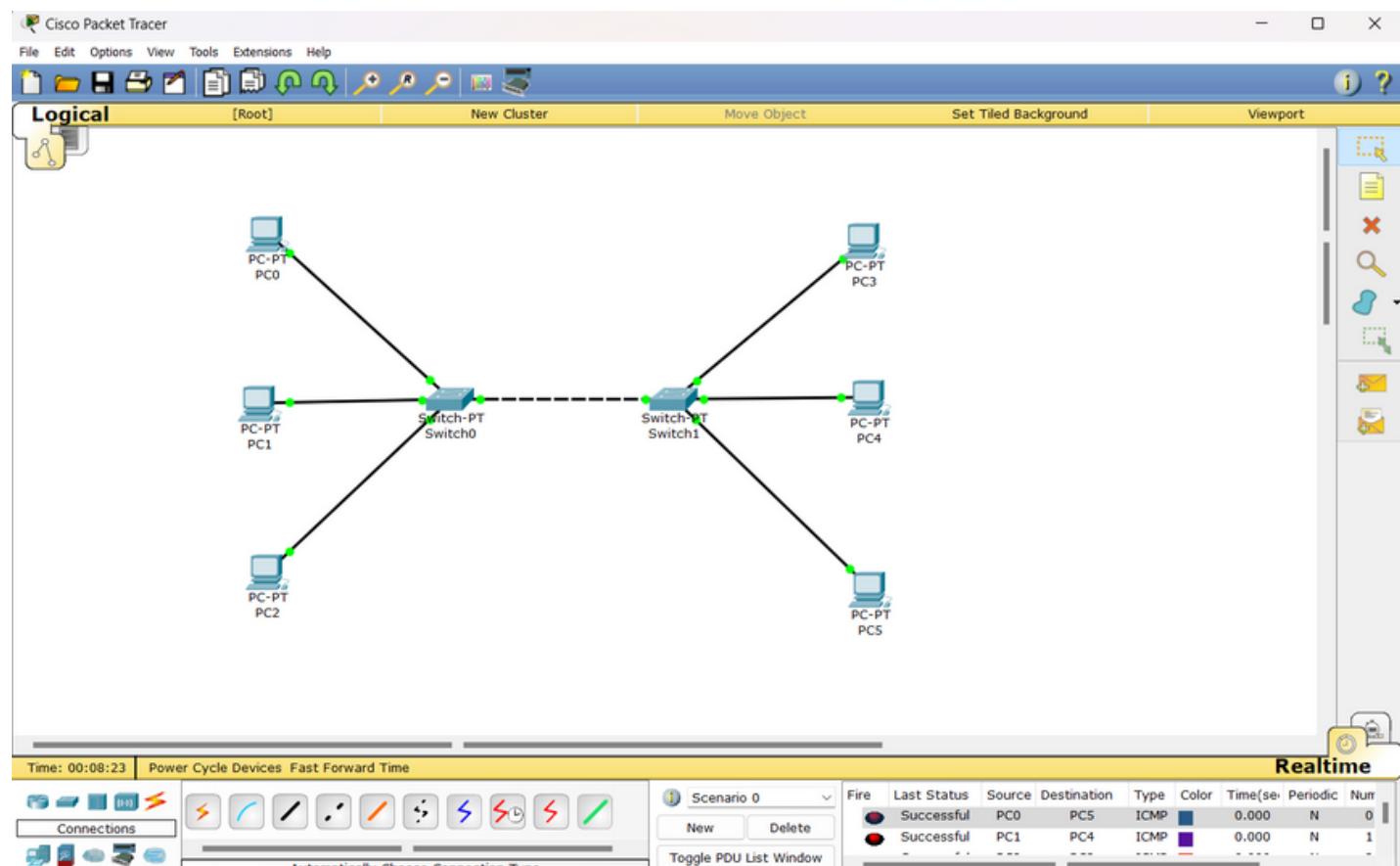
Step 3: Click on PC0>>Desktop>>IP Configuration a window as shown in figure should appear on your screen. Assign IP Address, Subnet Mask, Default Gateway, Similarly assign IP Address, Subnet Mask, Default Gateway to each PC.

Device ID	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.1	255.255.255.0	192.168.1.10
PC1	192.168.1.2	255.255.255.0	192.168.1.10
PC2	192.168.1.3	255.255.255.0	192.168.1.10
PC3	192.168.1.4	255.255.255.0	192.168.1.10
PC4	192.168.1.5	255.255.255.0	192.168.1.10
PC5	192.168.1.6	255.255.255.0	192.168.1.10

Note: IP Address of PC's should be different and Default Gateway should be same when using Switch



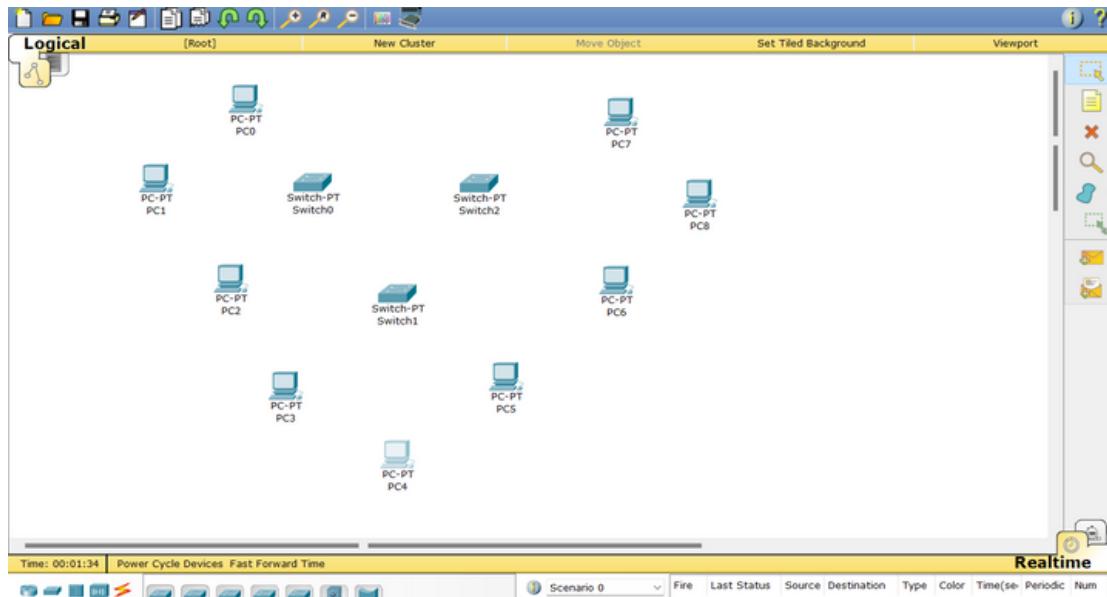
Step 4: Verify your network by sending messages from one PC to another. From Right hand side toolbar select “Simple Empty PDU”. Drop PDU on one PC and then on another PC on Canvas. In PDU list window, if Last Status is shown as “Successful” then consider that your network is working properly.



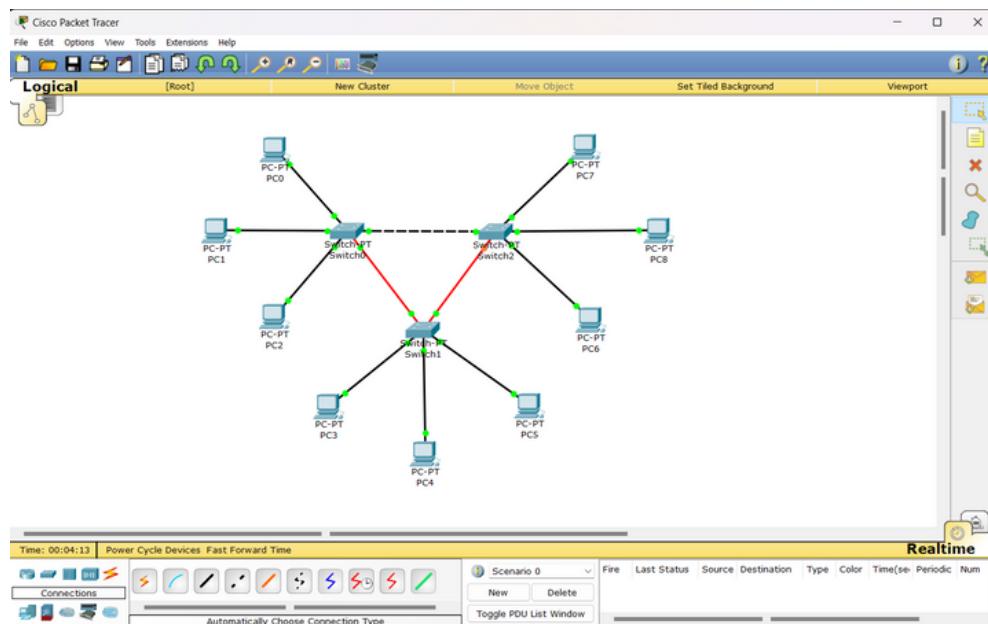
Practical 4

Aim: Using Packet Tracer, connect a network in triangular shape with three layer two switches and every switch will have four computer. Verify their connectivity with each other.

Step 1: From the left corner of bottom toolbar select "End Devices" and then from the right hand side panel select "PC". Drag and Drop nine PC's on the Canvas. From the left corner of bottom toolbar select "Switches" and then from the right hand side panel select "Switch- PT" and then drag and drop three Switches (Switch-PT) on Canvas. Your Canvas should look as shown in figure below.

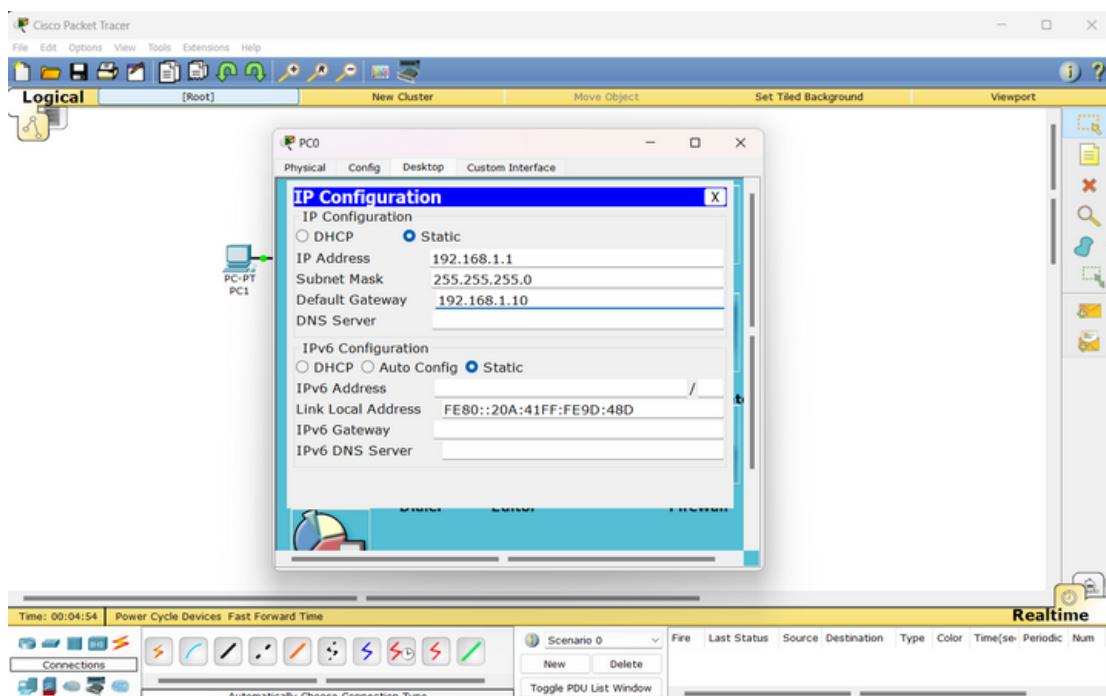


Step 2: From the left corner of bottom toolbar select "Connections" and then from the right hand side panel select "Automatically Choose Connection Type". Connect PC0, PC1, PC2 to Switch0 and connect PC3, PC4, PC5 to Switch1 connect PC6, PC7, PC8 to Switch2. Your Canvas should look as shown in figure below.

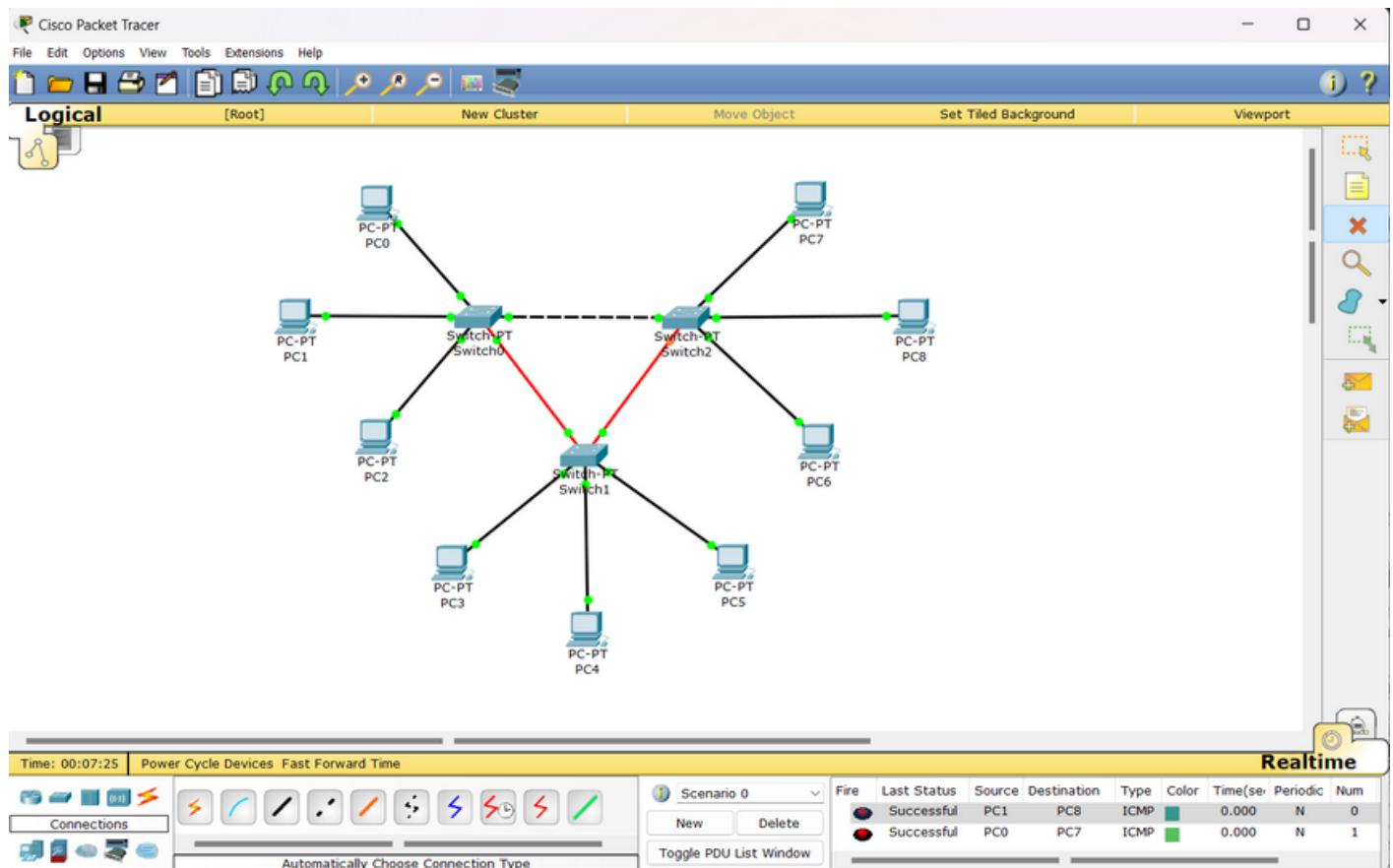


Step 3: Click on PC0>>Desktop>>IP Configuration a window as shown in figure should pear on your screen. Assign IP Address, Subnet Mask, Default Gateway, Similarly assign Address, Subnet Mask, Defualt Gateway to each PC.

Device ID	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.1	255.255.255.0	192.168.1.10
PC1	192.168.1.2	255.255.255.0	192.168.1.10
PC2	192.168.1.3	255.255.255.0	192.168.1.10
PC3	192.168.1.4	255.255.255.0	192.168.1.10
PC4	192.168.1.5	255.255.255.0	192.168.1.10
PC5	192.168.1.6	255.255.255.0	192.168.1.10
PC5	192.168.1.7	255.255.255.0	192.168.1.10
PC6	192.168.1.8	255.255.255.0	192.168.1.10
PC7	192.168.1.8	255.255.255.0	192.168.1.10
PC8	192.168.1.9	255.255.255.0	192.168.1.10



Step 4: Verify your network by sending messages from one PC to another. From Right hand side toolbar select “Simple Empty PDU”. Drop PDU on one PC and then on another PC on Canvas. In PDU list window, if Last Status is shown as “Successful” then consider that your network is working properly.

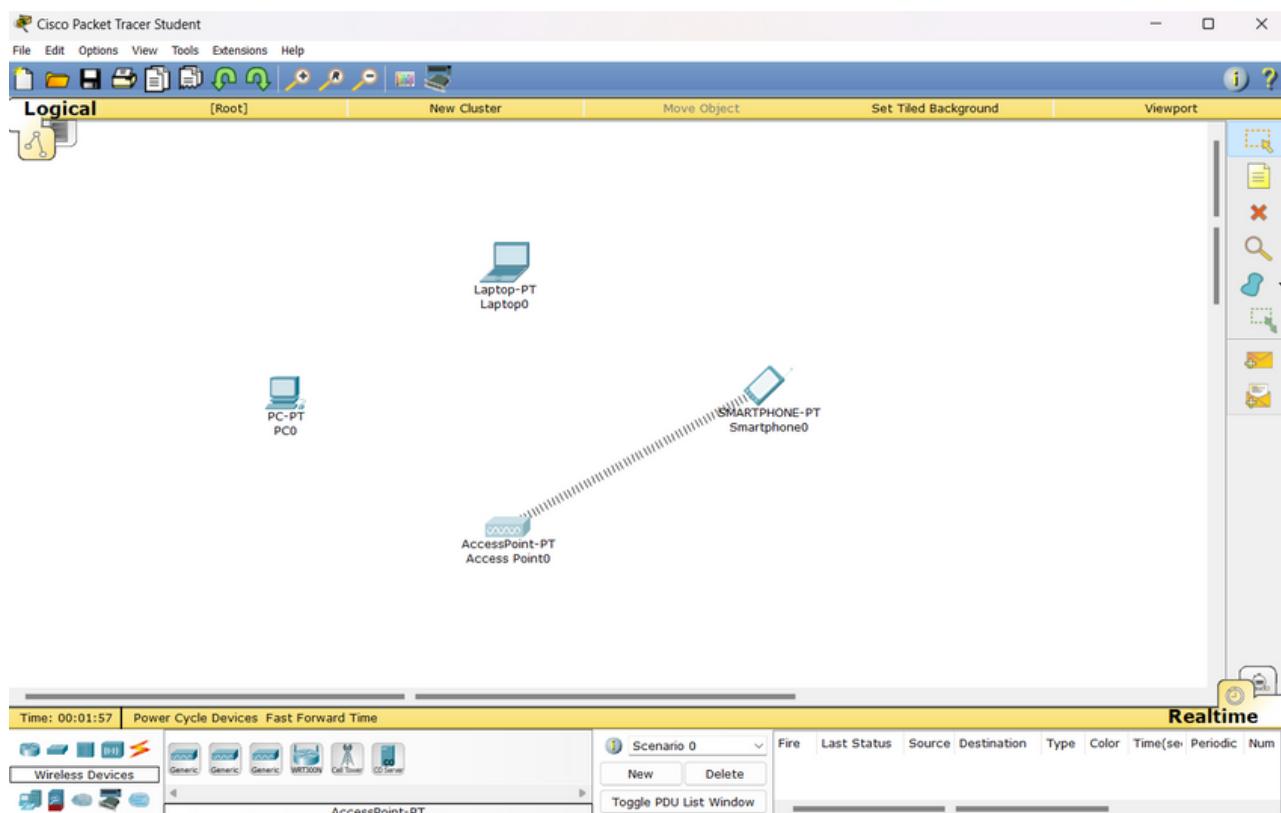


Practical 5

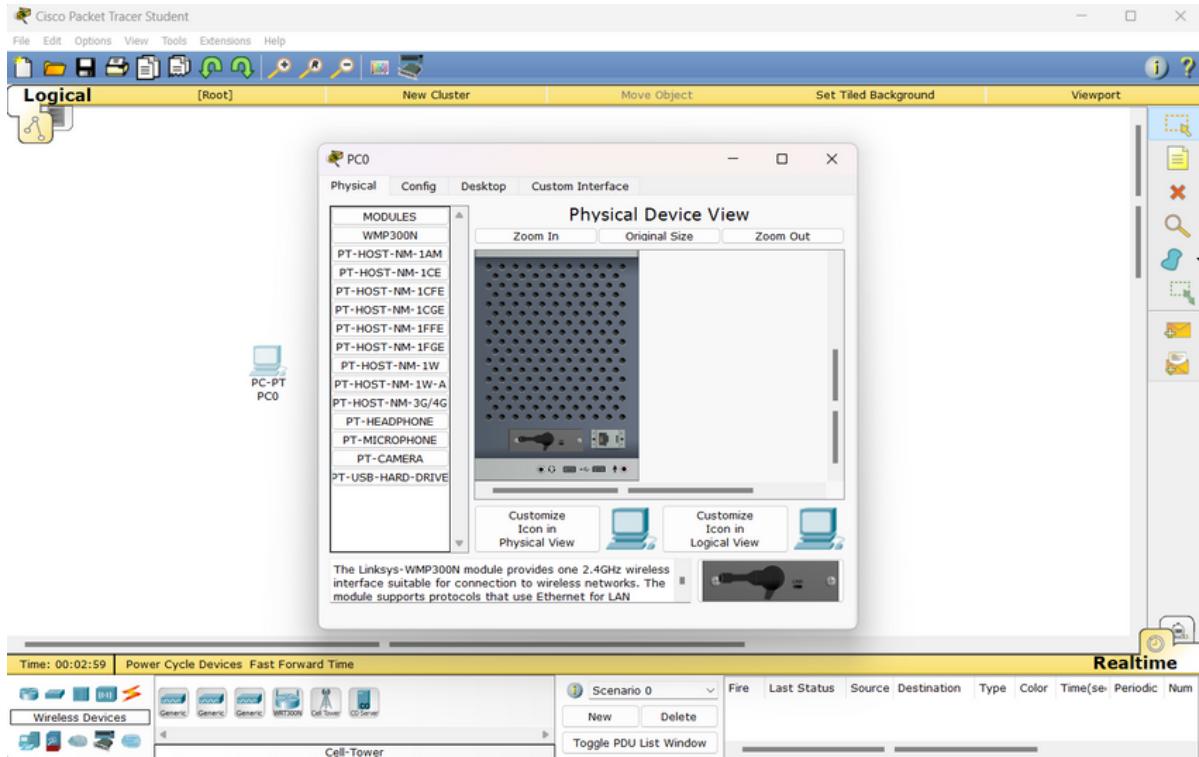
Aim: Using Packet Tracer, create a wireless network of multiple PCs using appropriate access point.

Step 1: From the left corner of bottom toolbar select 'Selection On Left Most Panel in Bottom Toolbar' and then from the right hand side panel select 'Selection On Adjacent Panel' drag and drop devices on Canvas. Refer table below.

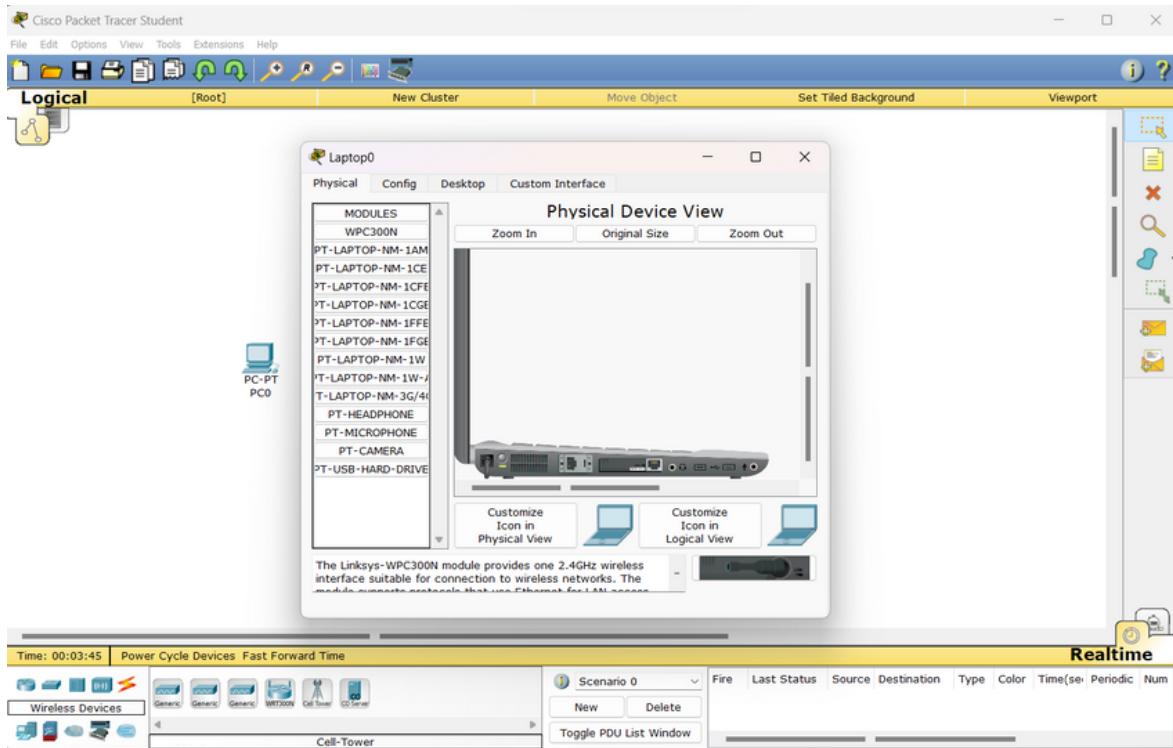
Selection on Leftmost Panel in Bottom Toolbar	Selection on Adjacent Aanel	Device ID
End Devices	PC-PT	PC0
End Devices	Laptop-PT	Laptop0
End Devices	SmartPhone-PT	SmartPhone0
Wireless Devices	AccessPoint-PT	AccessPoint0



Step 2: Click on PC0 in Physical tab view Physical view of CPU is shown. Switch OFF the CPU and then remove the PT-HEADPHONE module from CPU and then add WMP300N module to CPU and Switch ON the CPU.

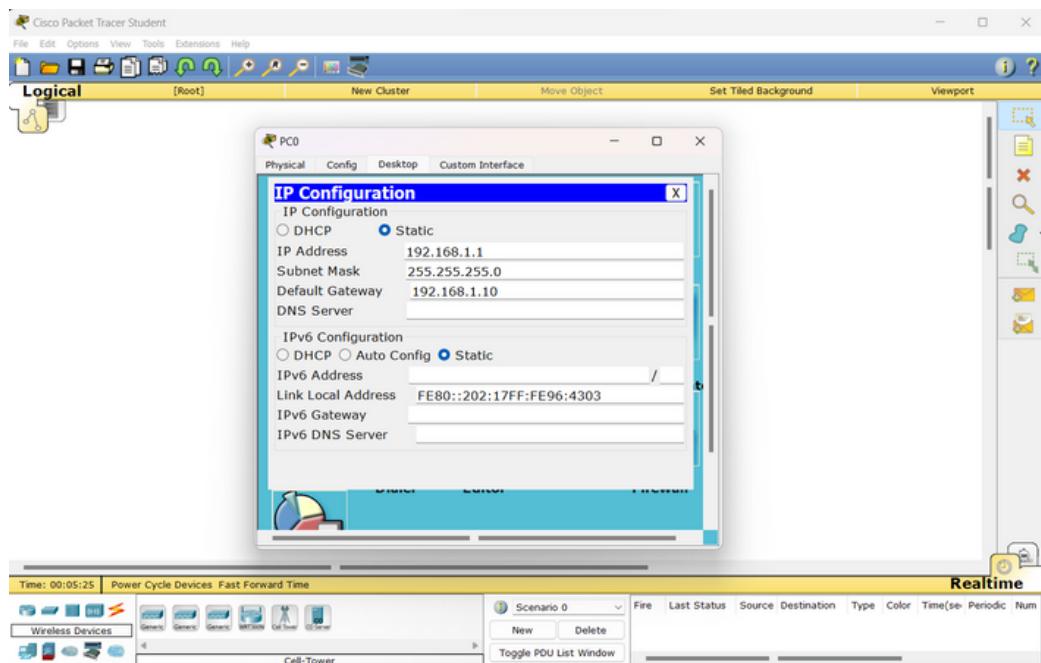


Step 3: Click on Laptop0 in Physical tab view Physical view of Laptop is shown. Switch OFF the Laptop and then remove the PT-HEADPHONE module from Laptop and then add WMP300N module to Laptop and Switch ON the Laptop.

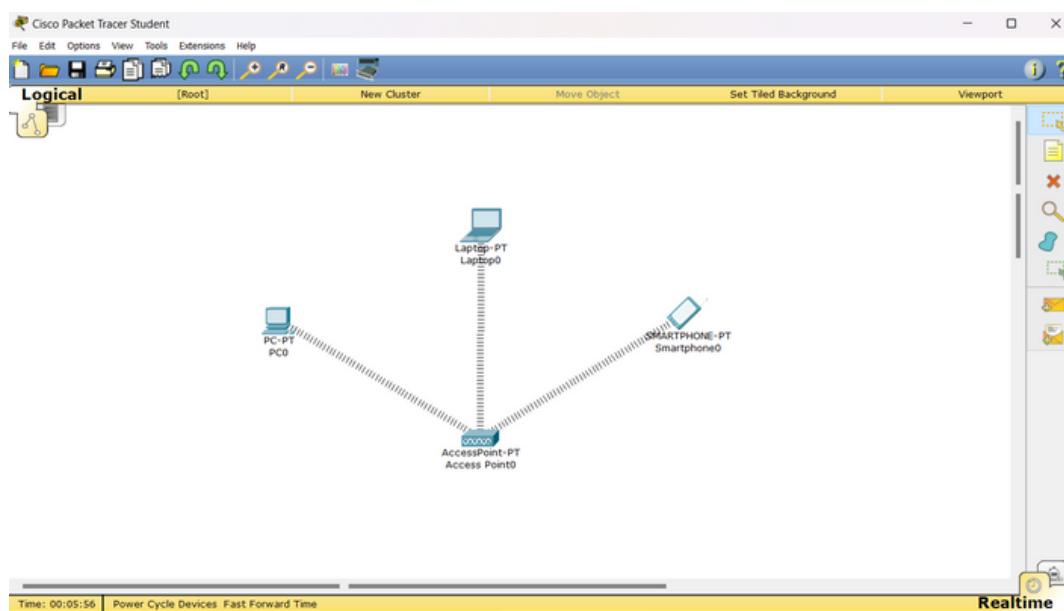


Step 4: Click on PC0>>Desktop>> IP Configuration a window as shown in figure shou appear on your screen. Assign IP Address, Subnet Mask, Default Gateway to PC0 and similarly for Laptop0.

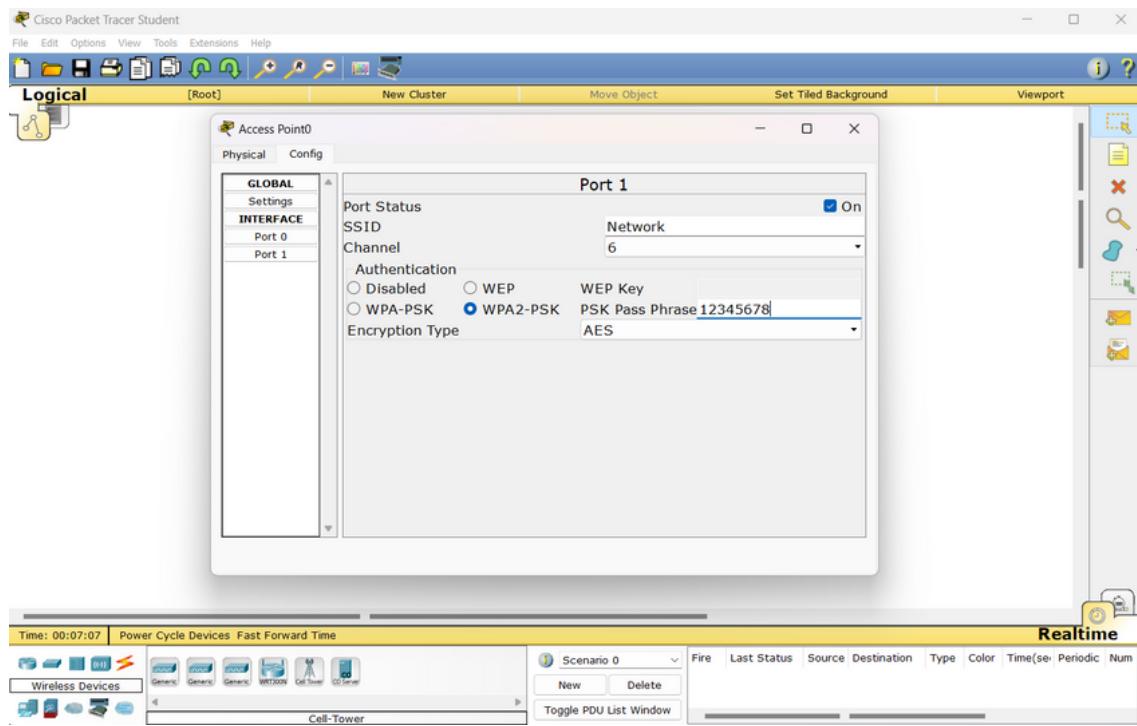
Device ID	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.1	255.255.255.0	192.168.1.10
Laptop0	192.168.1.2	255.255.255.0	192.168.1.10



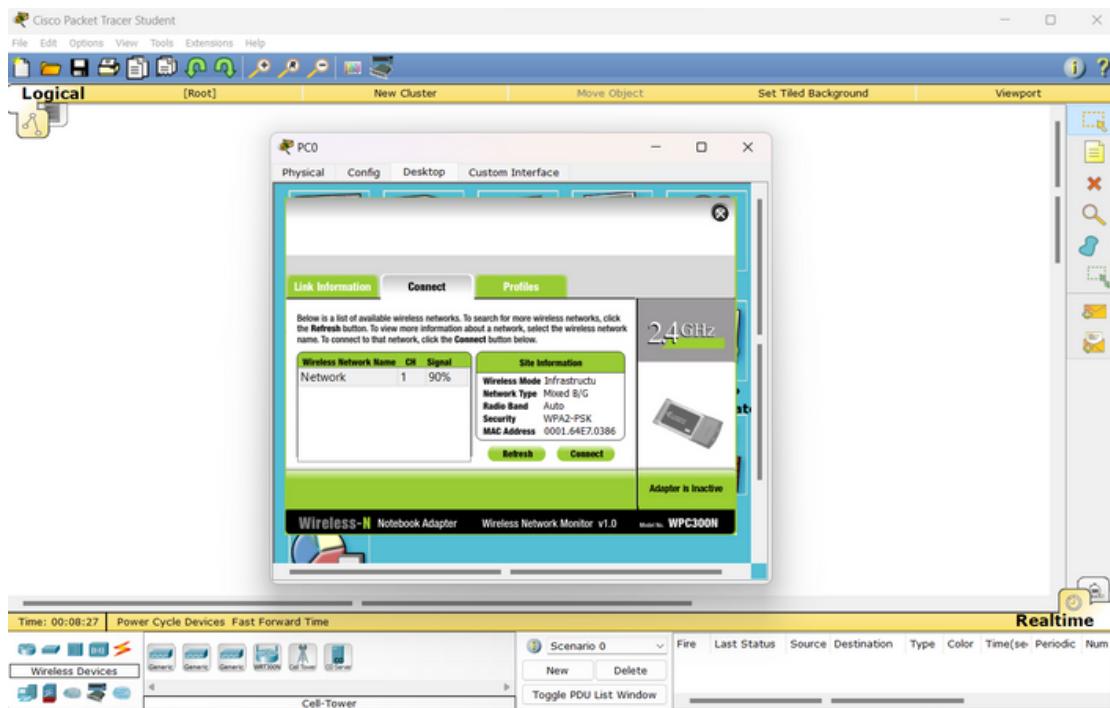
Step 5: Hardware module and setting IP address PC0 and Laptop0 must have been connect to AccessPoint0. Your canvas should be as shown in figure below.



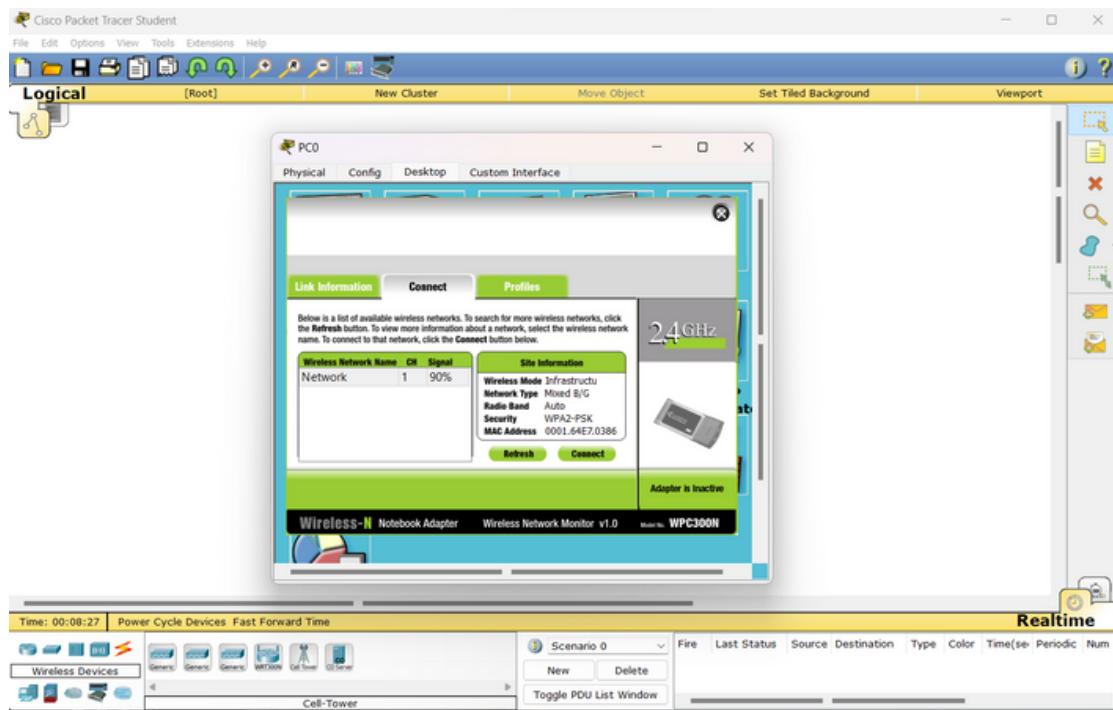
Step 6: Click On Access Point0>>Config>>Port 1. Assign SSID=Network, and in frame Authentication select WPA2-PSK assign Pass Phrase of your choice(e.g. 123456789) to Access Point0.



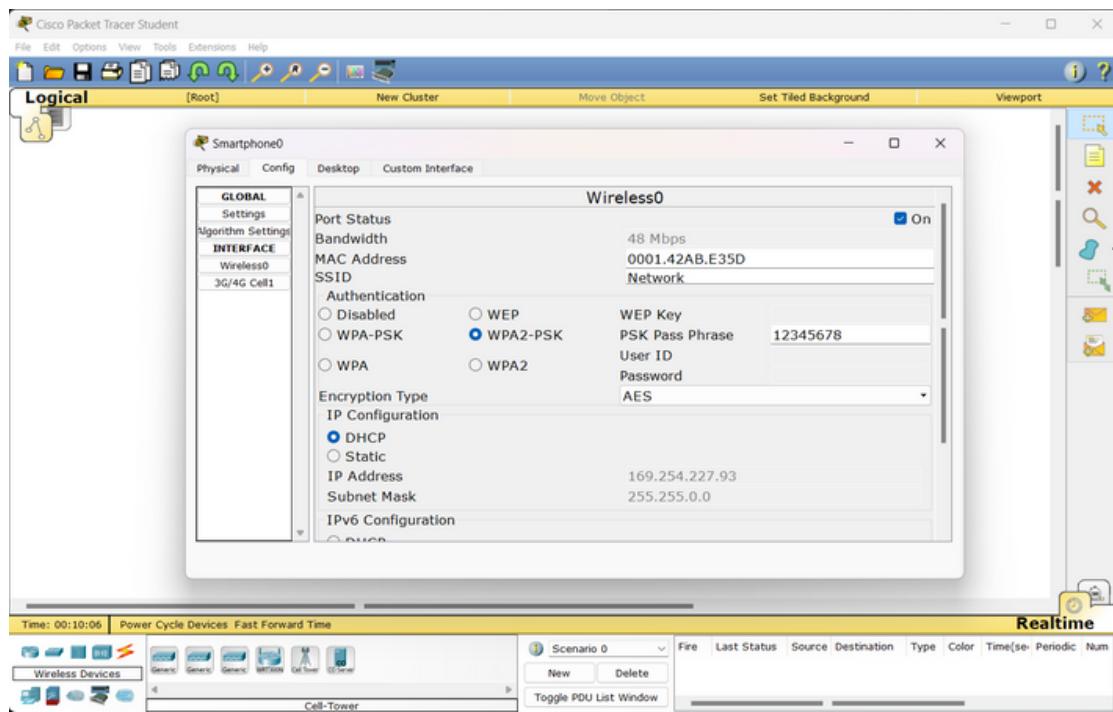
Step 7: Click On PC0>>Desktop>>Wireless Connections a window as shown in figure should appear on your screen. Click On Connect>>Refresh. SSID of Access Point) should appear in list of available connections. Click On SSID of Access Point) and then Click on Connect.



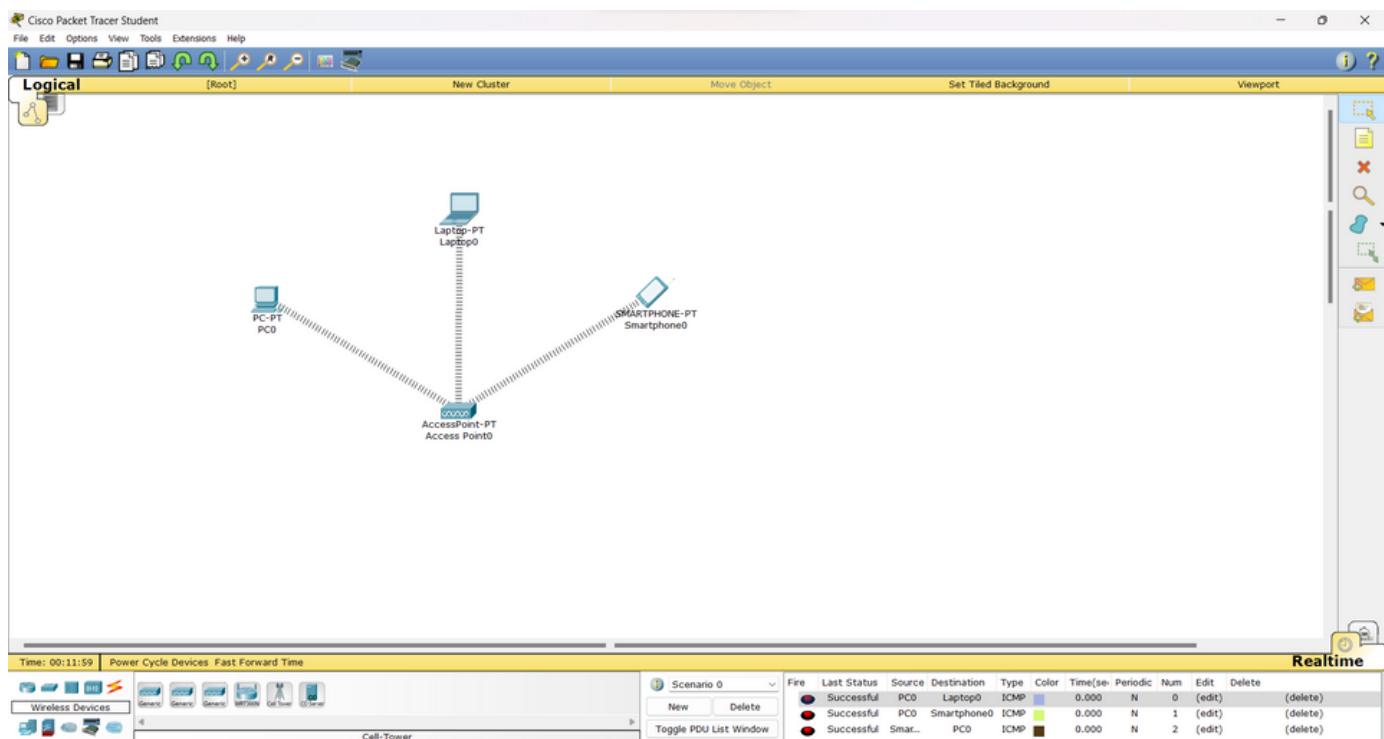
Step 8: After clicking on Connect a dialog box as shown in figure below will appear asking for Pass Phrase. Enter the Pass Phrase(e.g. 123456789)and then Click On Connect. Similarly Connect Laptop) to Access Point.



Step 9: Click On Smartphone0>>Config>>Wireless a window as shown in figure should appear on your screen. Enter SSID of Access Point)(e.g. Network) and then in Authentication frame select WPA2-PSK and enter Pass Phrase(e.g. 123456789).



Step 10: Verselect "Simple by ending messages from one PC to another. From Right hand side toolbar selectce Som Che Empty PDU", Drop PDU on one PC to another. sidother window, if Last Stand Device and thenuccessful" then consider that your network is working properly.

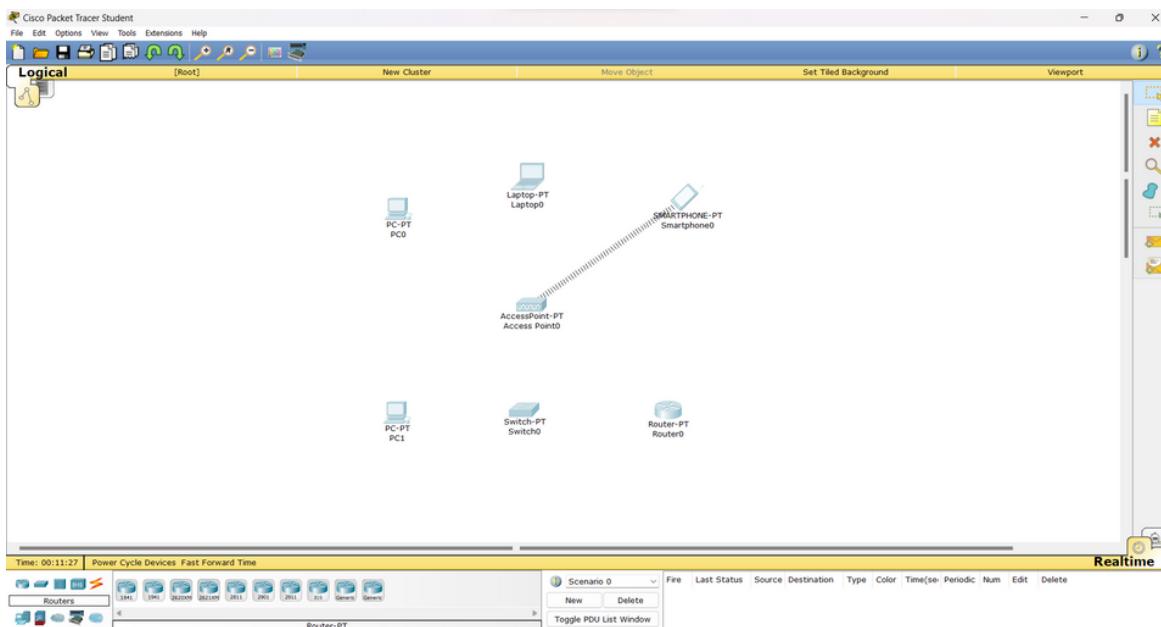


Practical 6

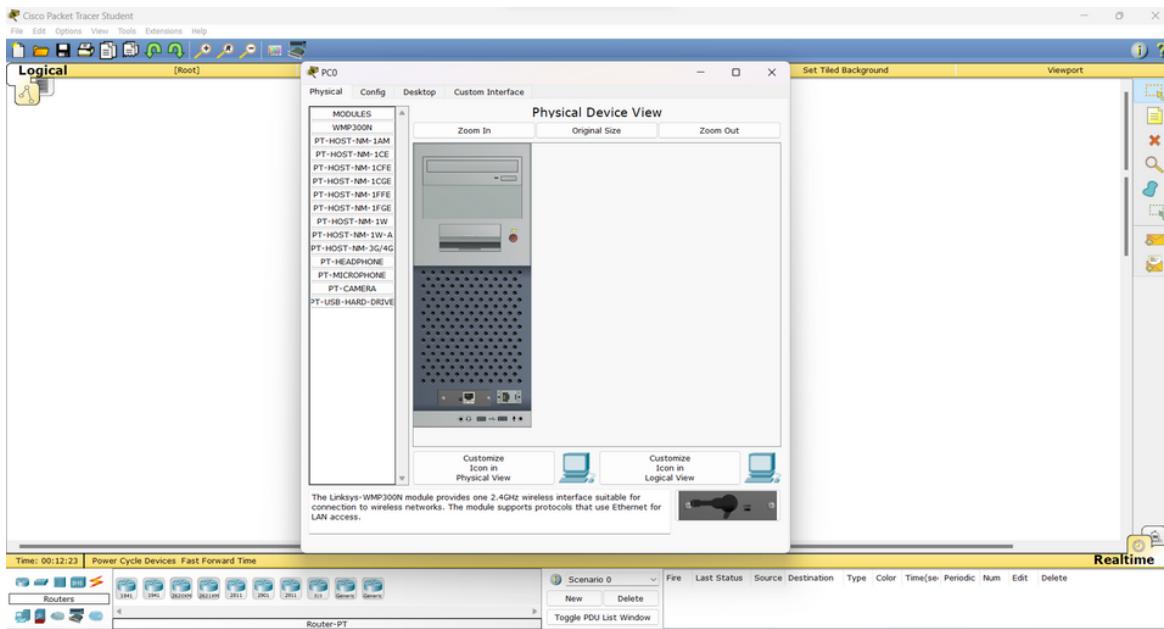
Aim: Using Wireshark, network analyzer, set the filter for ICMP, TCP, HTTP, UDP, FTP and perform respective protocol transactions to show/prove that the network analyzer is working.

Step 1: From the left corner of bottom toolbar select 'Selection On Left Most Panel in Bottom Toolbar' and then from the right hand side panel select 'Selection On Adjacent Panel' drag and drop devices on Canvas. Refer table below.

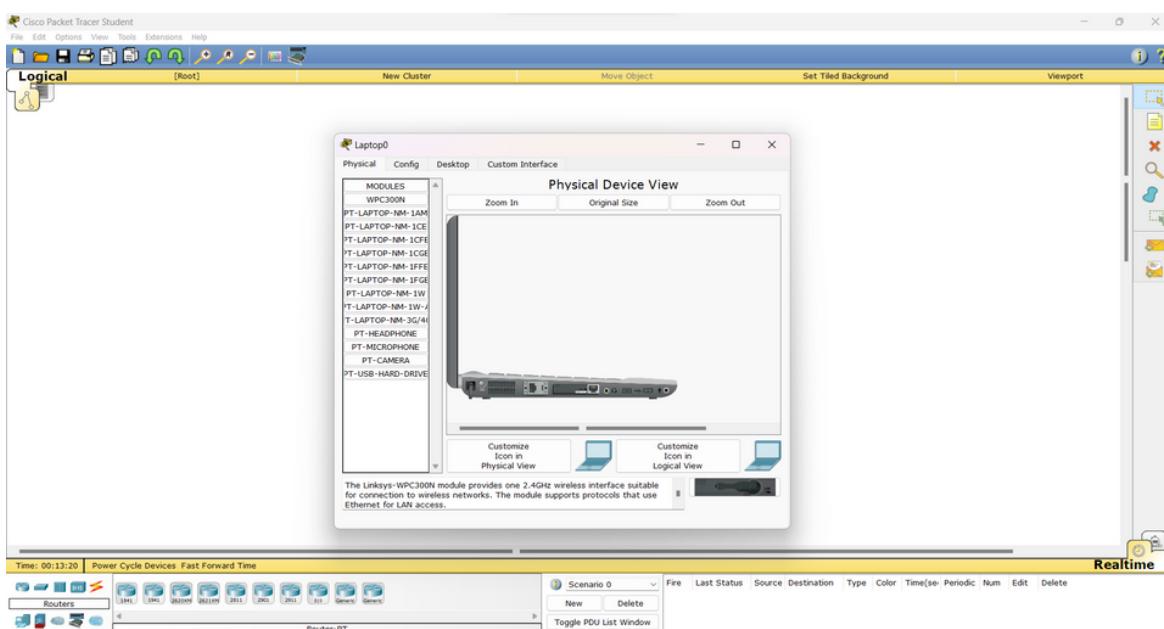
Selection on Leftmost Panel in Bottom Toolbar	Selection on Adjacent Aanel	Device ID
End Devices	PC-PT	PC0
End Devices	PC-PT	PC1
End Devices	Laptop-PT	Laptop0
End Devices	SmartPhone-PT	SmartPhone0
Routers	Router-PT	Router0
Switches	Switch-PT	Switch0
Wireless Devices	AccessPoint-PT	AccessPoint0



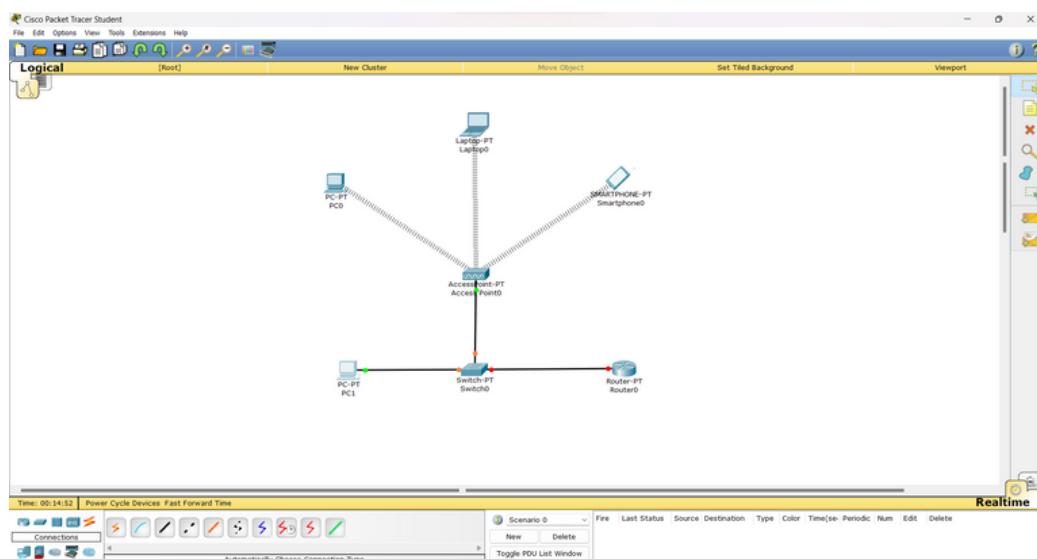
Step 2: Click on PC0 in Physical tab view Physical view of CPU is shown. Switch OFF the CPU and then remove the PT-HEADPHONE module from CPU and then add WMP300N module to CPU and Switch ON the CPU.



Step 3: Click on Laptop0 in Physical tab view Physical view of Laptop is shown. Switch OFF the Laptop and then remove the PT-HEADPHONE module from Laptop and then add WMP300N module to Laptop and switch ON the Laptop.

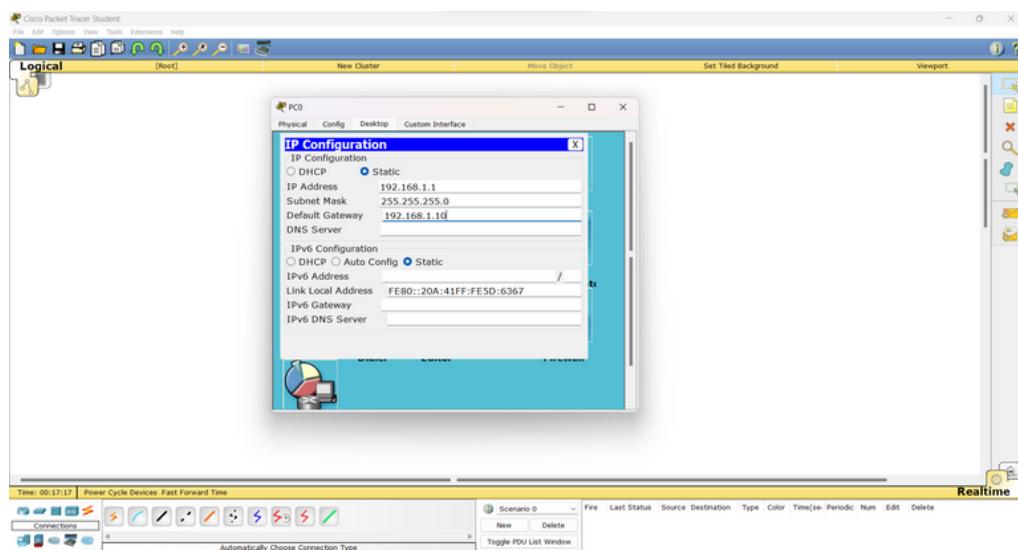


Step 4: From the left corner of bottom toolbar select "Connections" and then from the right hand side panel select "Automatically Choose Connection Type". Connect PC1 to Switch0, then Connect Router0 to Switch0 and Connect Switch to Acces Point0. Your Canvas should look as shown in figure below.

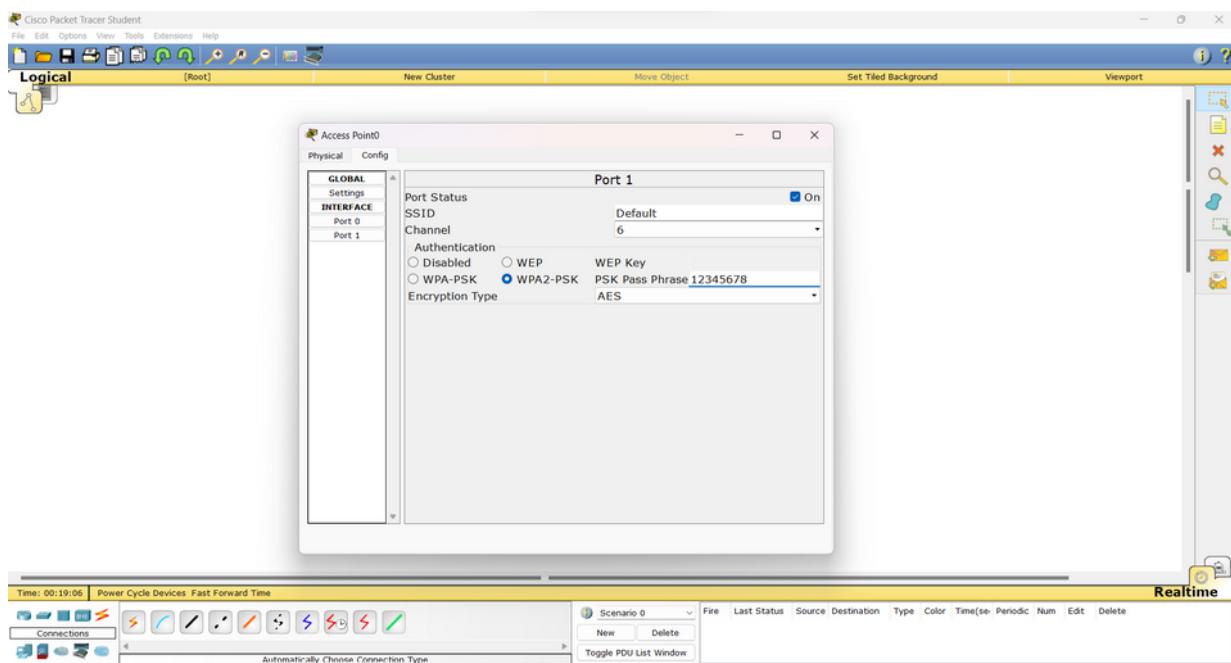


Step 5: Click on PC0>>Desktop>>IP Configuration a window as shown in figure should appear on your screen. Assign IP Address, Subnet Mask, Default Gateway to PC0 and similarly for PC1, Laptop0.

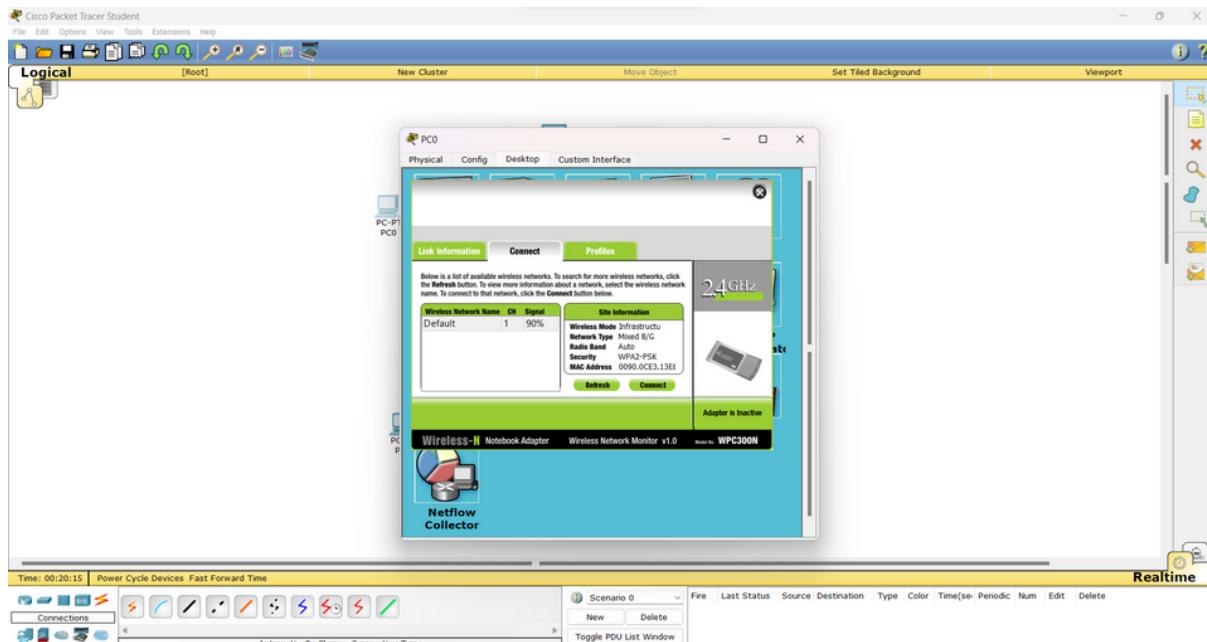
Device ID	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.1	255.255.255.0	192.168.1.10
Laptop0	192.168.1.2	255.255.255.0	192.168.1.10



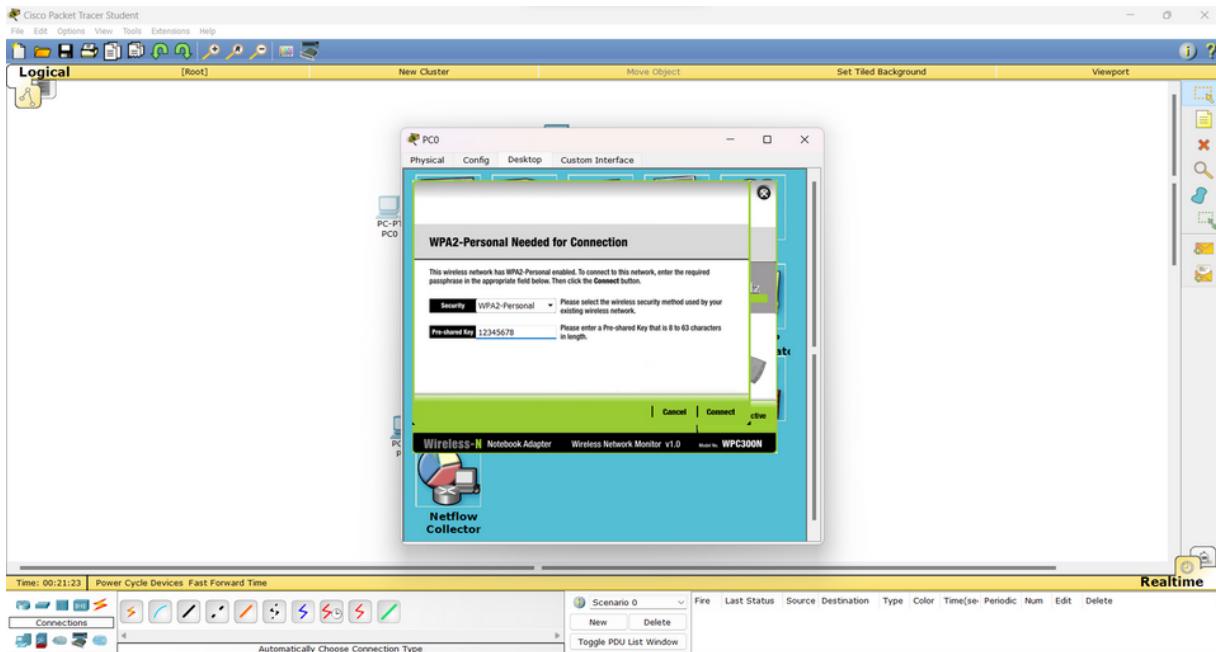
Step 6: Click On Access Point0>>Config>>Port 1. Assign SSID-Network, and in frame Authentication select WPA2-PSK assign Pass Phrase of your choice(e.g. 123456789) to Access Point0.



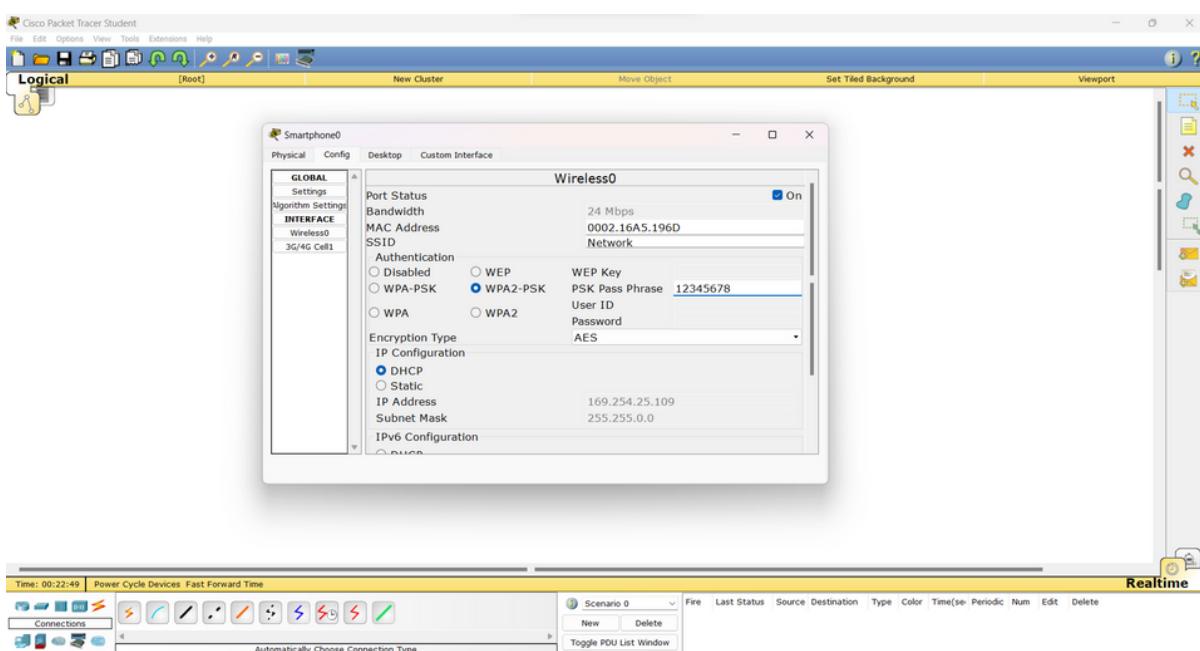
Step 7: Click On PC0>>Desktop>>Wireless Connections a window as shown in figure should appear on your screen. Click On Connect>>Refresh. SSID of Access Point0 should appear in list of available connections. Click On SSID of Access Point0 and then Click on Connect.



Step 8: After clicking on Connect a dialog box as shown in figure below will appear asking for Pass Phrase. Enter the Pass Phrase(e.g. 123456789)and then Click On Connect. Similarly Connect Laptop0 to Access Point0.



Step 9: Click On Smartphone0>>Config>>Wireless0 a window as shown in figure should appear on your screen. Enter SSID of Access Point0(e.g. Network) and then in Authentication frame select WPA2-PSK and enter Pass Phrase(e.g. 123456789).



Step 10: Verselect "Simple by ending messages from one PC to another. From Right hand side toolbar selectce Som Che Empty PDU", Drop PDU on one PC to another. sidother window, if Last Stand Device and thenuccessful" then consider that your network is working properly.

