Experiment No 4: Set up Wireless Access Point

PART A

(PART A: TO BE REFFERED BY STUDENTS)

A.1 Aim: Set up and configuration of Wireless Access Point.

A.2 Objectives: After successful completion of this experiment students will be able to Set up and configure access point and use it to access internet.

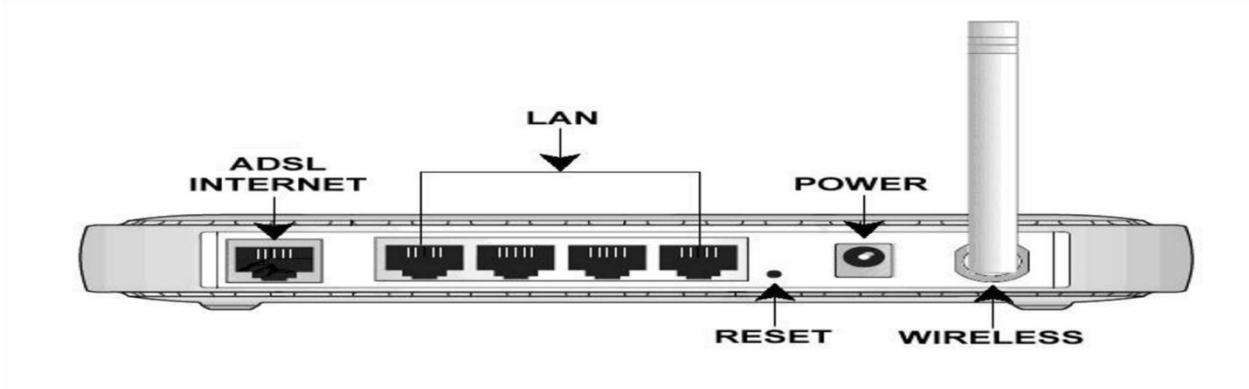
A.3 Outcomes: Student will be able to implement security algorithms for mobile communication network.

A.4 Tools Used/programming language: Cicso Packet Tracer

A.5 Theory:

Access point is a device used to connect Wireless LAN with internet. Access point is used in wireless LAN which might be having standard either IEEE standard or HIPERLAN. It will also be called as router since it works in network layer. Wireless LAN means each computer/laptop connected with each other wirelessly. There are two kinds of LAN possible I) adhoc wireless and ii) infrastructure based Access point configuration is done in such way that it is able to transfer and receive all packets of LAN securely if firewall is installed in that AP.

Access point is will be used here is wifi (D LINK) shown in diagram1 In diagram it is shown that DSL pin where DSL connection will be done where as other port will be used to connect any desktop computer. Following diagram2 will give idea about how access point is seen in wireless LAN Diagram 1

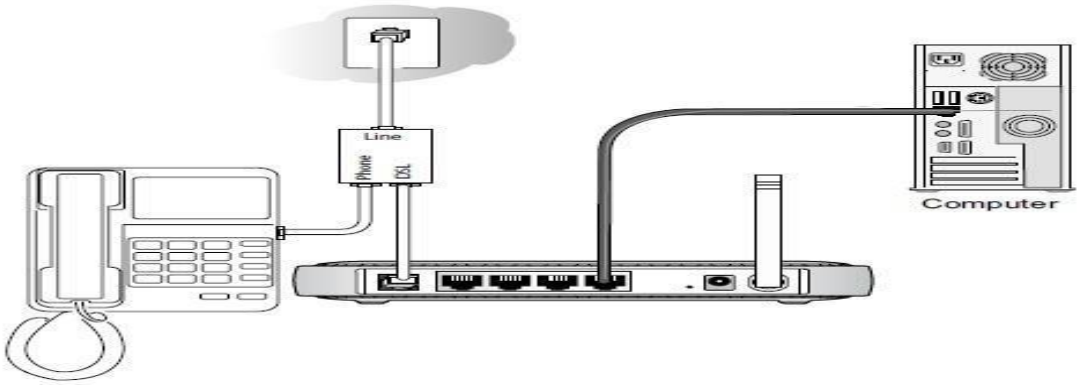


Note: Configuration of AP requires physical connection with internet via ADSL port then start WIFI then Update parameters of AP as per user requirement such as password /LAN name by visiting WIFI router page via internet explorer.

- **Wireless Access Point (WAP):** A **wireless access point** (**WAP**) is a networking hardware device that allows wireless devices to connect to a wired network using Wi-Fi, or related standards. The AP usually connects to a router (via a wired network) as a standalone device, but it can also be an integral component of the router itself. An AP is differentiated from a hotspot, which is the physical space where the wireless service is provided.

- **Steps for configuration of WAP:**

1. Connect the DSL port of the NETGEAR modem router to the phone line, via the DSL Micro filter, as shown in the diagram. Use an Ethernet cable to connect the computer to any of the four LAN ports as shown in the diagram. Connect the NETGEAR DSL modem router to its power supply unit (PSU) (Not shown in the diagram) and wait about a minute for it to boot up.



2. Open an Internet Explorer browser and type the router IP address which would be either **http://192.168.0.1** or **http://192.168.1.1** in the address bar and press Enter. ○ The Login window will prompt for the router configuration username and password.

- The default username is **admin** and the default password is **password**
- The username and password are case sensitive.

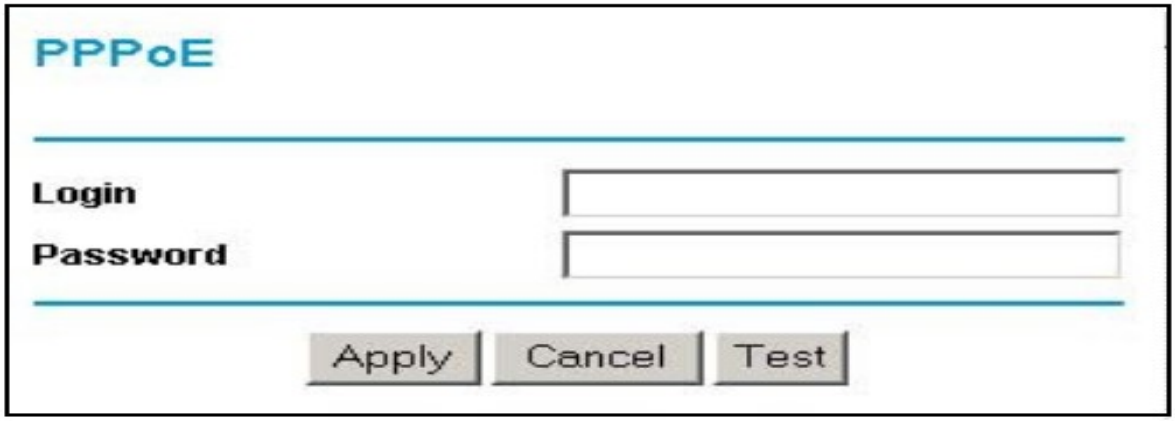
- If the default username and password is not working, you might have changed the password. Please try other passwords that you might have changed to. Otherwise, a factory reset is needed to restore the router to factory defaults. To perform a factory reset, see Restoring a NETGEAR home router to the factory default settings.

3. Click **Setup Wizard** on the top left corner, Select **Yes** for the Setup Wizard to detect the type of Internet connection and click **Next**.

4. The Setup Wizard will report which connection type it has discovered, and then display the appropriate configuration page. Please follow the steps under the connection type detected by your router:

Note: If the Setup Wizard finds no connection, please check the physical connection of your devices, and make sure that your ISP has already activated your DSL account.

Wizard Detected PPPoE Login Account Setup

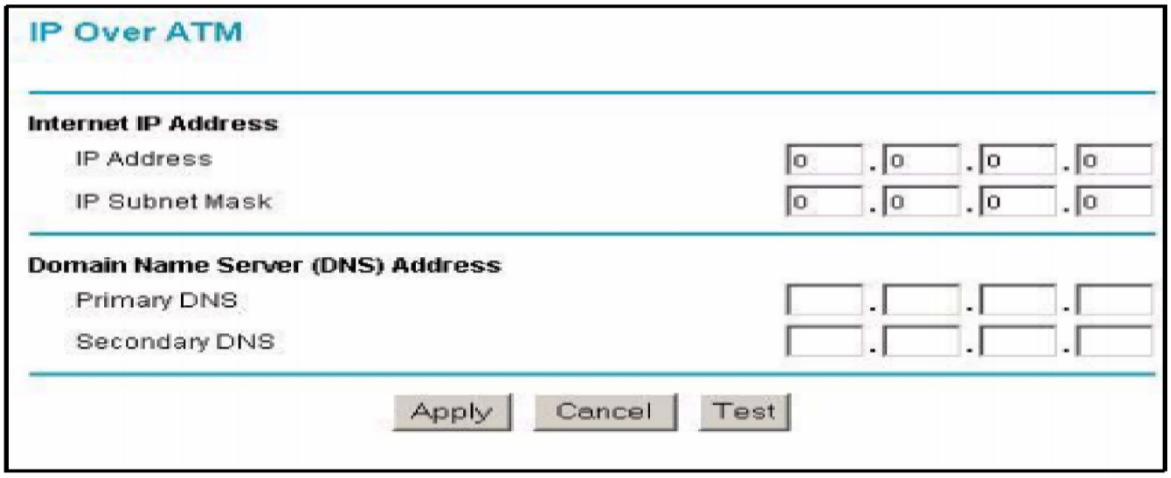


Enter the PPPoE login user name and password. These fields are case sensitive. This information should have been provided to you by your ISP.

Wizard Detected Dynamic IP Account Setup

Click **Apply** to set Dynamic IP as the connection method.

Wizard Detected IP over ATM Account Setup



5.

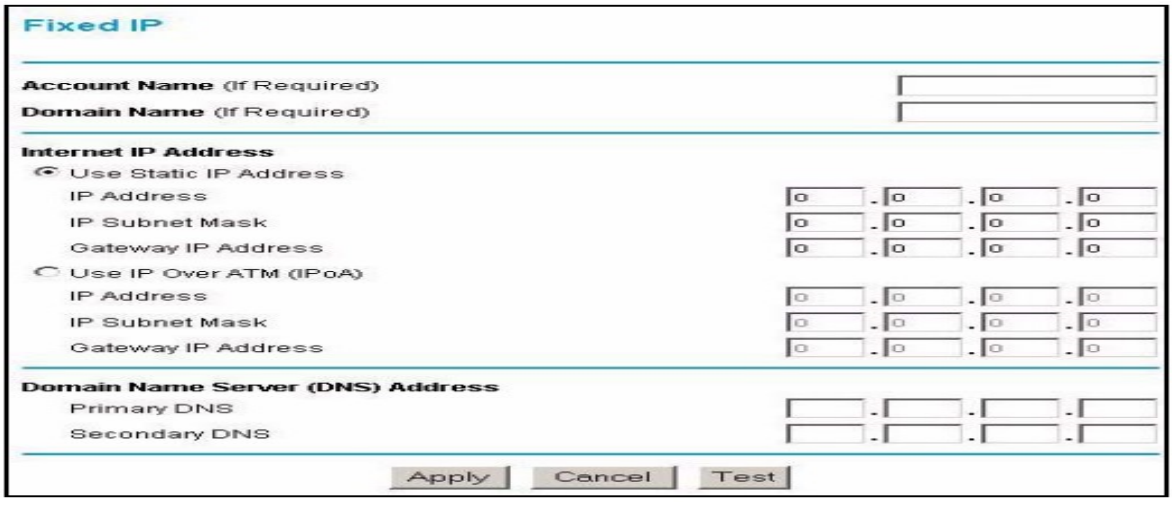
1. Enter your assigned IP Address and Subnet Mask. This information should have been provided to you by your ISP.

2. Enter the IP address of your ISP's Primary DNS Server. If a Secondary DNS Server address is available, enter it also.

3. Click **Apply** to save the settings.

4. Click **Test** to test your internet connection.

6. **Wizard Detected Fixed IP (Static) Account Setup**



1. If required, enter the **Account Name** and **Domain Name** from your ISP.
2. Choose **Use Static IP Address** or **Use IP Over ATM** (IPoA-RFC1483 Routed) according to the information from your ISP.

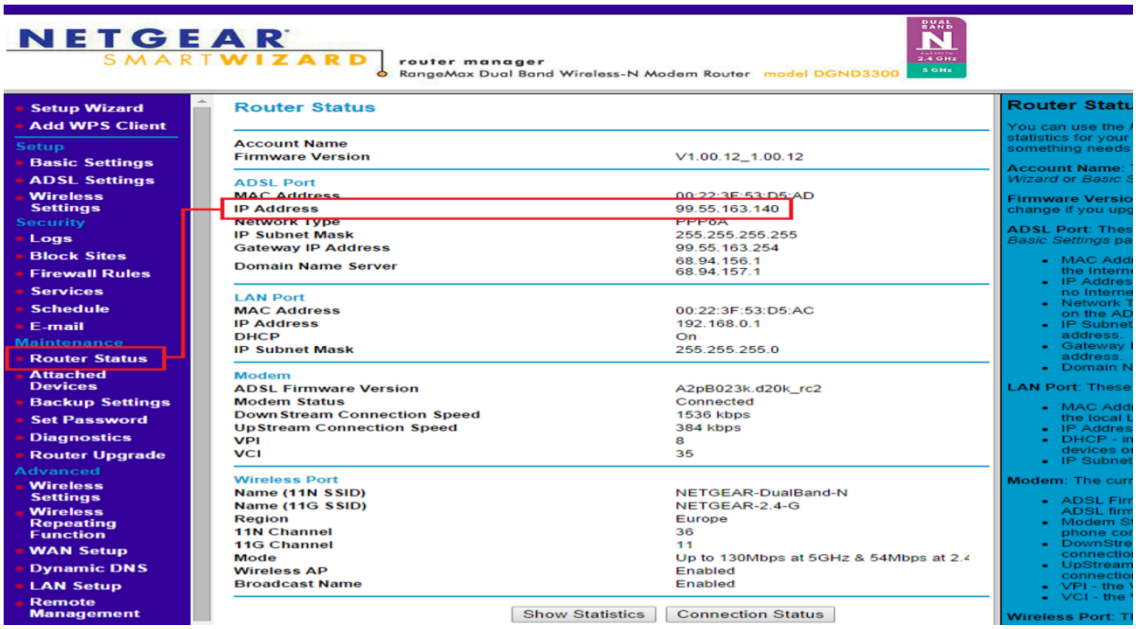
If you choose IPoA, the router will be able to detect the gateway IP address but you still need to provide the router IP address.

3. Enter your assigned **IP Address**, **Subnet Mask**, and the **IP Address** of your ISP's gateway router.

This information should have been provided to you by your ISP.

4. Enter the IP address of your ISP's Primary DNS Server. If a Secondary DNS Server address is available, enter it also. **5**. Click **Apply** to save the settings.
6. Click **Test** to test your internet connection.

7. The router will now save these settings. When complete, you can verify whether you are connected to the internet from the **Router Status** under **Maintenance** menu.



Verify that you have a valid IP address (not blank or 0.0.0.0) on the Internet or ADSL Port.

8. **Procedure on Cisco tracer: Download Cisco tracer from https://www.netacad.com/courses/packet-tracer.**
9. **Watch you tube video for WI router configuration in Cisco tracer:** https://www.youtube.com/watch?v=vu0najkh9vQ

PART B

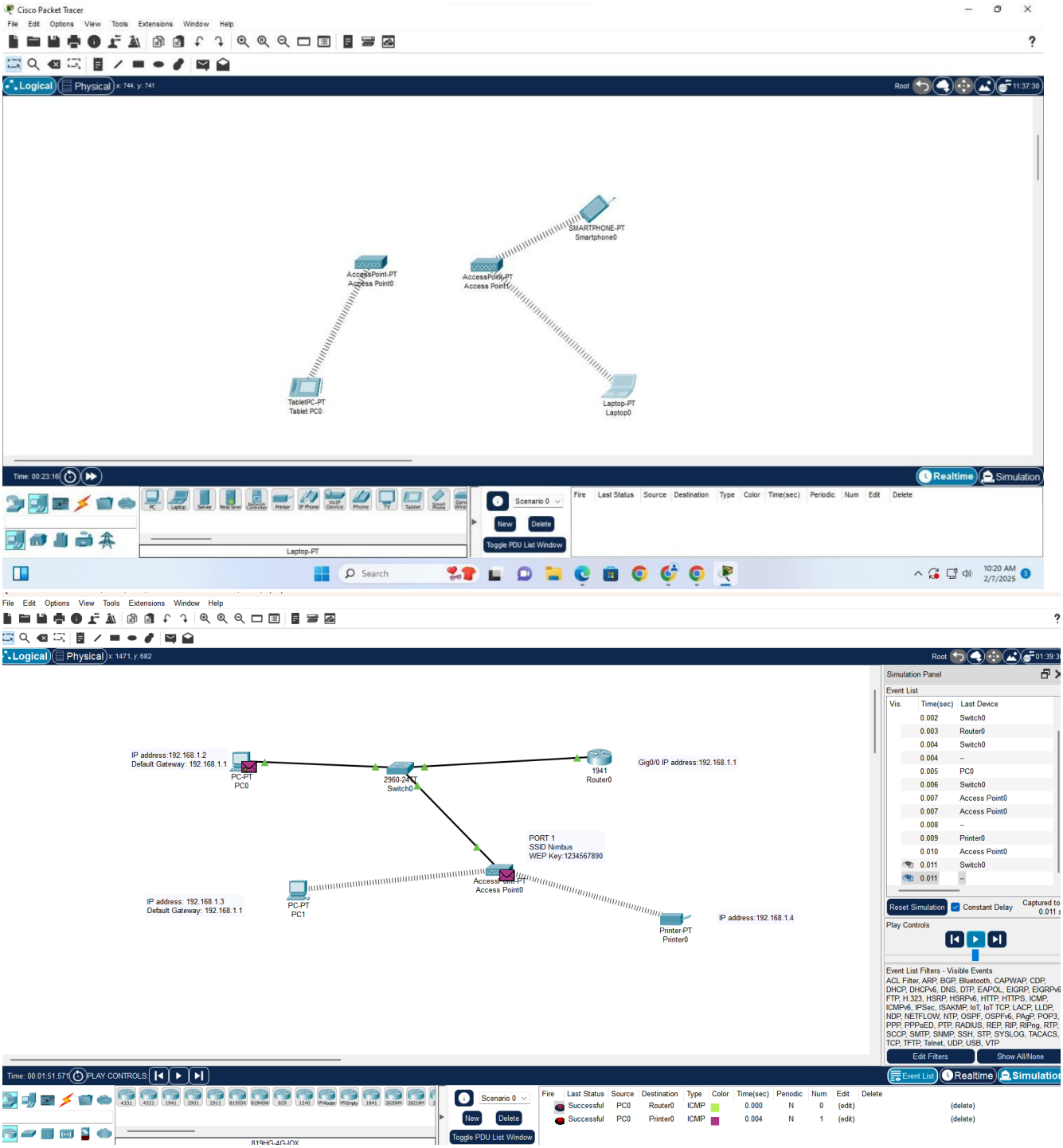
(PART B: TO BE COMPLETED BY STUDENTS)

(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the ERP or emailed to the concerned lab in charge faculties at the end of the practical in case the there is no ERP access available)

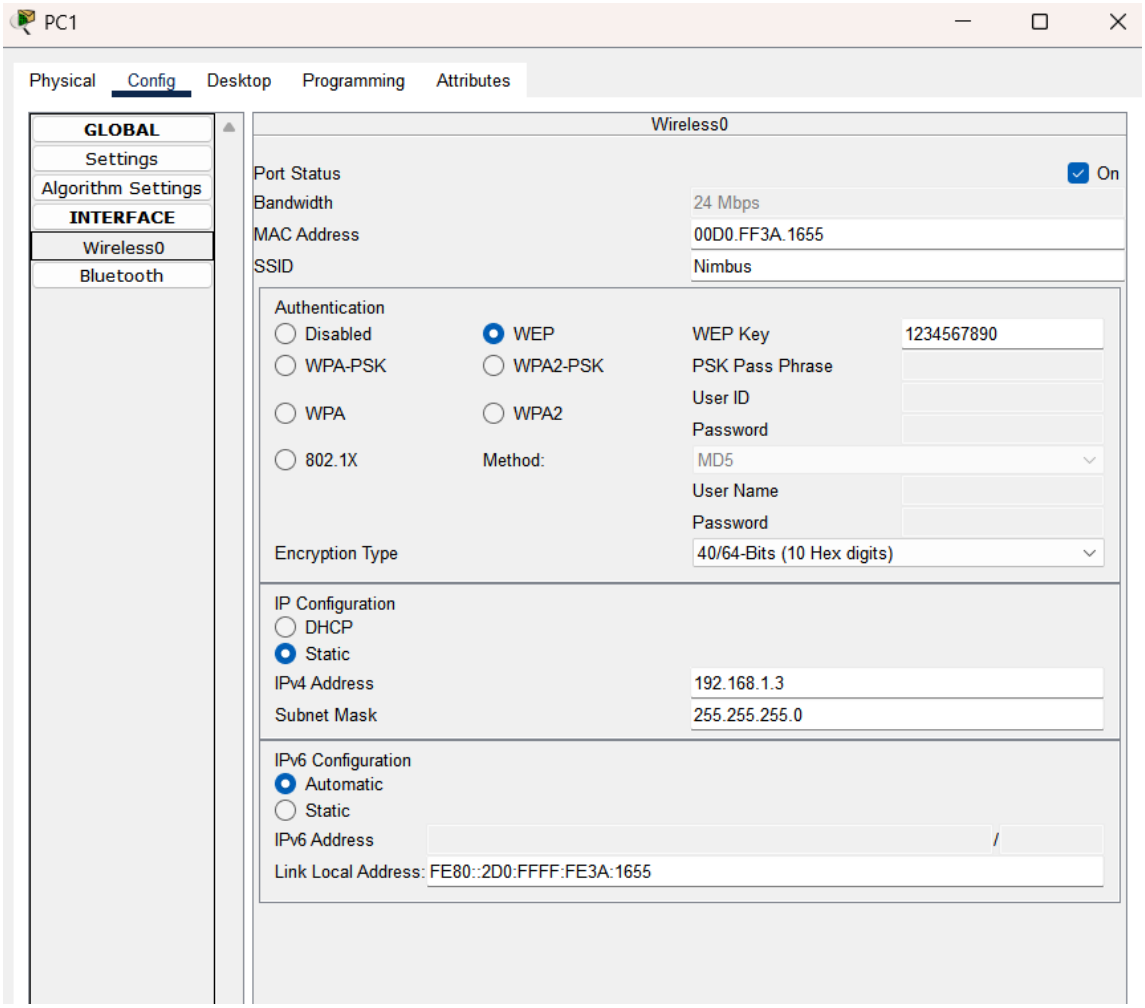
Roll No. B30	Name: Pranjal Bhatt
Class : TE COMPS B	Batch : B2
Date of Experiment:	Date of Submission
Grade :	

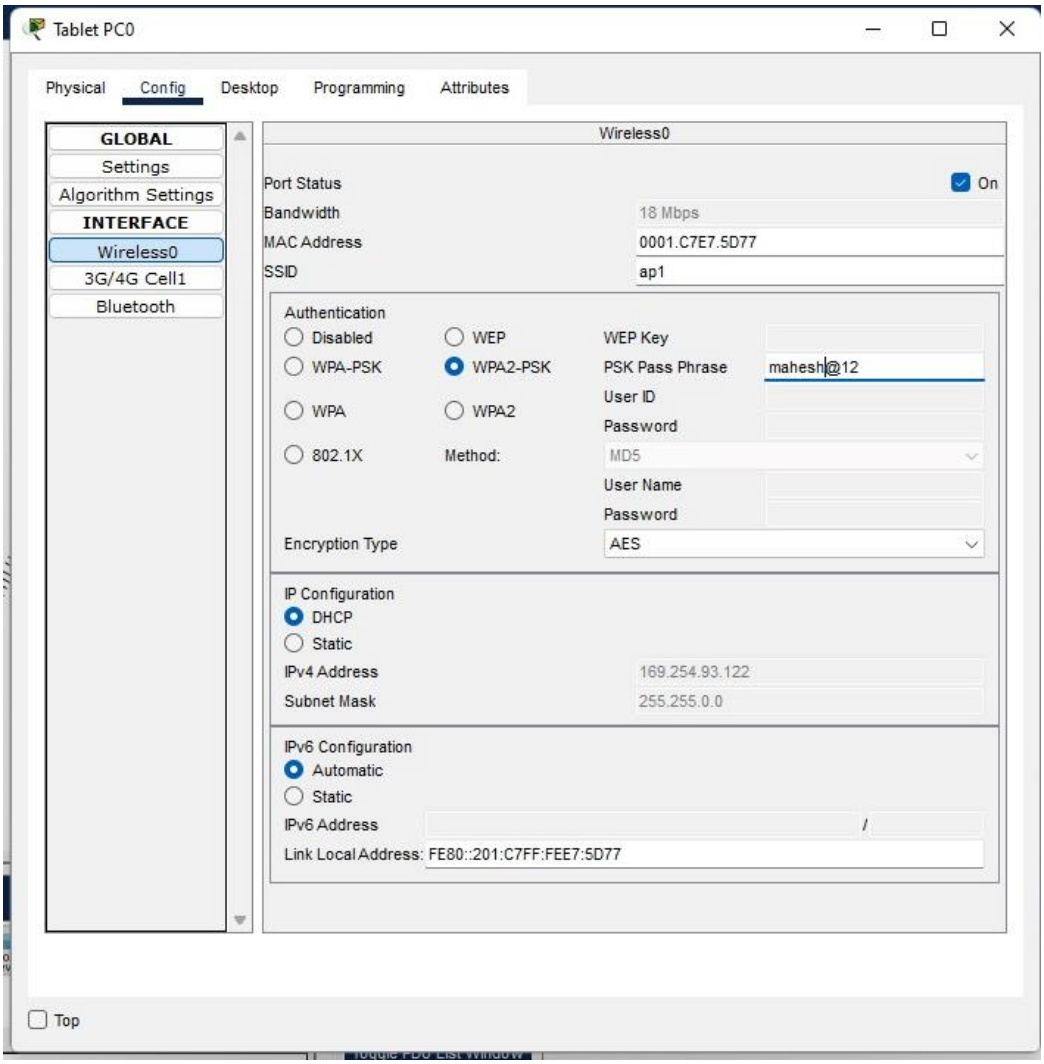
B.1 Question of Curiosity:

Q.1: Create small Wires less network using WAP. (attach all screenshots)

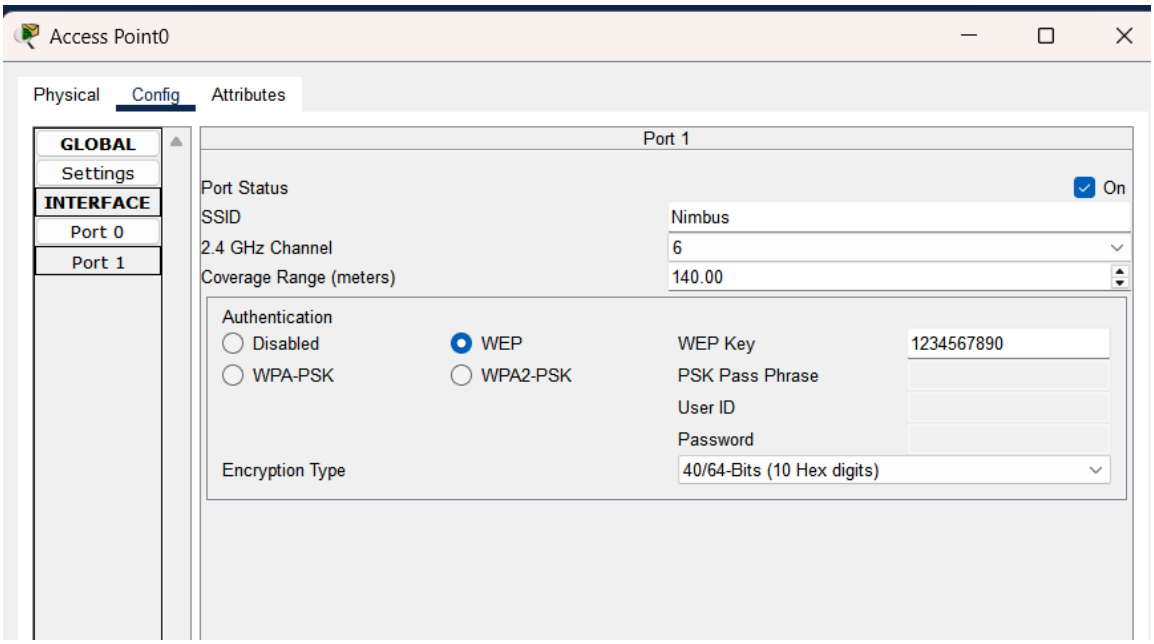


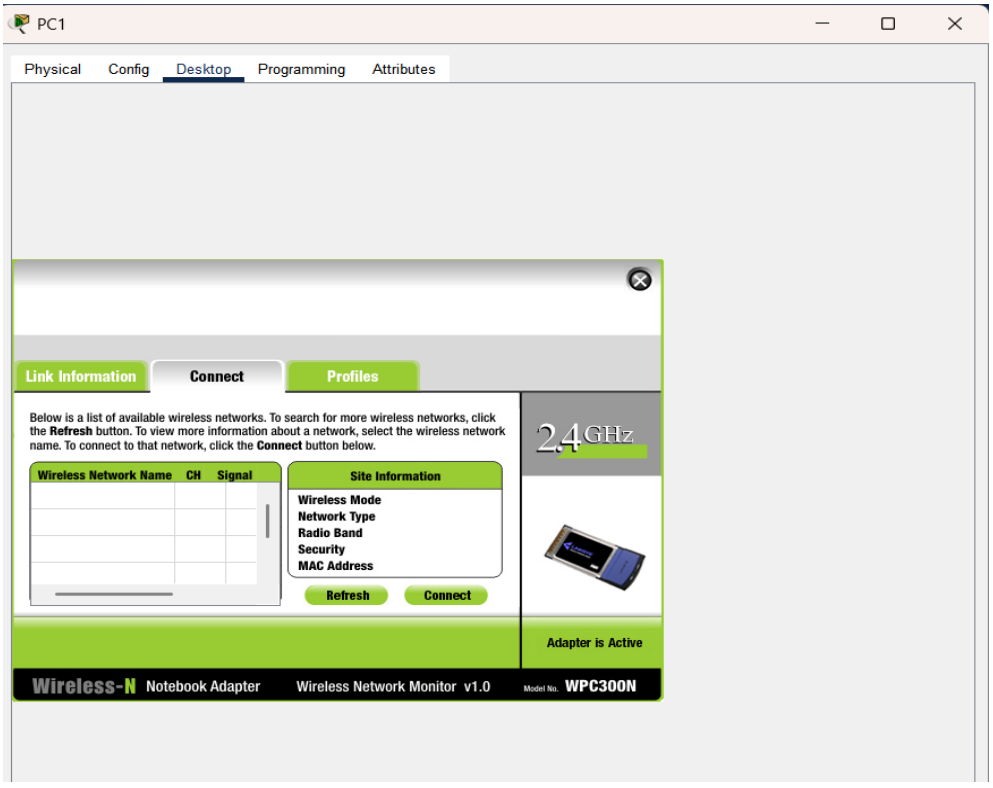
Q.2: How to Perform configuration of wireless access point. (Attach all screenshots)

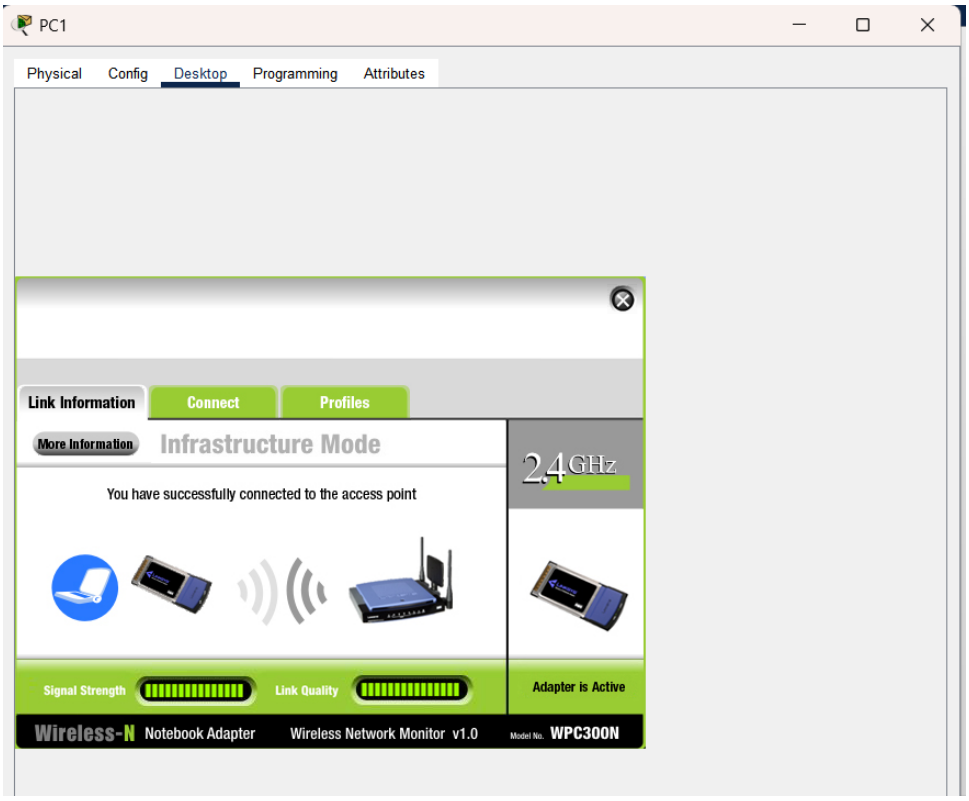

PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
On
Bandwidth
24 Mbps
MAC Address
00D0.FF3A.1655
SSID
Nimbus
Authentication
Disabled
WEP
WEP Key
1234567890
WPA-PSK
WPA2-PSK
PSK Pass Phrase
User ID
WPA
WPA2
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
40/64-Bits (10 Hex digits)
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.3
Subnet Mask
255.255.255.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address:
FE80::2D0:FFFF:FE3A:1655


Tablet PC0
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
3G/4G Cell1
Bluetooth
Wireless0
Port Status
On
Bandwidth
18 Mbps
MAC Address
0001.C7E7.5D77
SSID
ap1
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
maheshi@12
WPA
WPA2
User ID
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
AES
IP Configuration
DHCP
Static
IPv4 Address
169.254.93.122
Subnet Mask
255.255.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address:
FE80::201:C7FF:FEE7:5D77
Top


Access Point0
Physical
Config
Attributes
GLOBAL
Settings
INTERFACE
Port 0
Port 1
Port 0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto


Access Point0
Physical
Config
Attributes
GLOBAL
Settings
INTERFACE
Port 0
Port 1
Port 1
Port Status
On
SSID
Nimbus
2.4 GHz Channel
6
Coverage Range (meters)
140.00
Authentication
Disabled
WEP
WPA-PSK
WPA2-PSK
WEP Key
1234567890
PSK Pass Phrase
User ID
Password
Encryption Type
40/64-Bits (10 Hex digits)


PC1
Physical
Config
Desktop
Programming
Attributes
Link Information
Connect
Profiles
Below is a list of available wireless networks. To search for more wireless networks, click the Refresh button. To view more information about a network, select the wireless network name. To connect to that network, click the Connect button below.
2.4GHz
Wireless Network Name
CH
Signal
Site Information
Wireless Mode
Network Type
Radio Band
Security
MAC Address
Refresh
Connect
Adapter is Active
Wireless-N Notebook Adapter
Wireless Network Monitor v1.0
Model No. WPC300N



Q.3: How adhoc Wireless LAN will be created?

An **Ad-Hoc Wireless LAN** (Wireless Local Area Network) is created without requiring a central access point (AP) or router. Devices communicate directly with each other in a peer-to-peer fashion. The steps to create an ad-hoc WLAN are:

1. **Enable Wireless Network Interface**: Ensure that all participating devices have Wi-Fi enabled.
2. **Configure Ad-Hoc Mode**:
    1. In Windows/Linux/macOS, configure the Wi-Fi settings to **Ad-Hoc mode** instead of Infrastructure mode.
    2. Assign a **unique SSID** (network name) for the group.
3. **Set IP Addresses**:
    1. Devices must be assigned static IP addresses in the same subnet (if DHCP is unavailable).
4. **Establish Connections**:
    1. Each device scans for available Ad-Hoc networks and connects to the appropriate one.
5. **Enable File Sharing & Communication**:
    1. Devices can now communicate directly, share files, and form a temporary wireless network.

Q.4: What is difference between WLAN and WiMax ?

Feature	WLAN (Wireless Local Area Network)	WiMax (Worldwide Interoperability for Microwave Access)
Coverage Area	Typically up to **100 meters** (indoor/outdoor)	Covers **several kilometers** (up to 50 km in rural areas)
Technology Used	Uses **Wi-Fi (IEEE 802.11)** standards	Uses **IEEE 802.16** standard
Network Type	Designed for **local area networking** (home, office, campus)	Designed for **wide area networking** (broadband internet, rural access)
Speed	Speeds up to **9.6 Gbps** (latest Wi-Fi 6E)	Speeds up to **1 Gbps** for fixed connections
Infrastructure	Requires an **Access Point (AP)** or router	Uses **Base Stations (BS)** similar to cellular towers
Mobility Support	Supports limited mobility within coverage	Supports **high mobility** similar to cellular networks
Use Case	Home, office, campus networking	Rural broadband, metropolitan area networks, mobile broadband

B.2 Conclusion:

In this experiment, we successfully set up and configured a **Wireless Access Point (WAP)** using **Cisco Packet Tracer**. The experiment demonstrated the step-by-step process of establishing a **wireless LAN (WLAN)**, connecting it to the internet via **DSL**, and configuring essential parameters such as **SSID, security settings, and IP addressing**.