Singapore Polytechnic
School of Electrical and Electronics Engineering
ET1205: Wireless Technology Applications

Experiment 03: Setting Up Wireless LAN IEEE 802.11g Client and Access Point

Objectives:

Students will learn how to

- setup wireless IEEE 802.11g client using external **GW-US54Mini2** USB dongle and the **Planex Wireless Utility** client software to connect SP wireless network
- connect and configure a wireless network with IEEE 802.11g client Adapters and Access Point for Homes/small Offices network
- setup infrastructure and ad-hoc WLAN

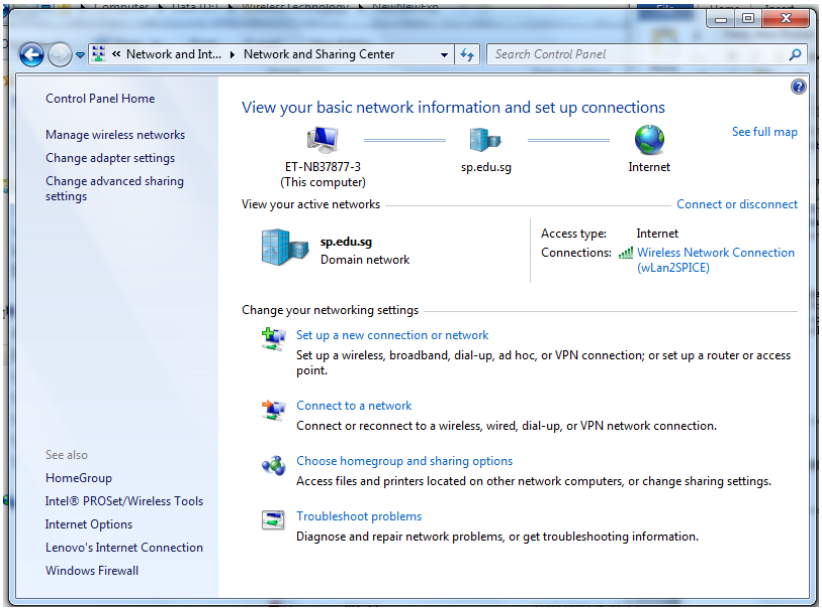
Introduction:

Today, IEEE 802.11 Wireless LAN is used widely to enable mobile users to access the Internet wirelessly. This provides convenience and flexibility to users.
In this experiment, we will learn how to setup the external Wireless LAN client adaptor on the laptop using Planex Wireless Utility client software.

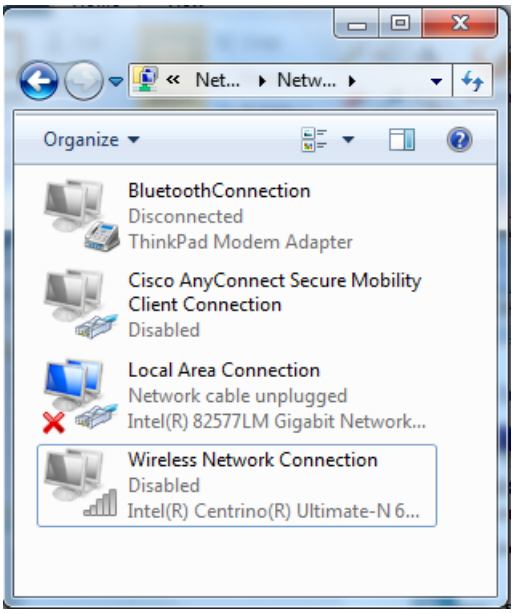
Procedure:

A. Setting up IEEE 802.11g Wireless LAN client using external IEEE 802.11g Wireless Mini-USB Adaptor and its software (Planex Wireless Utility)

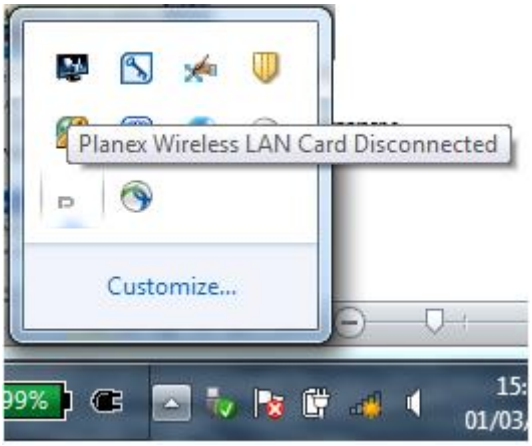
1. Go to Start > Control Panel and click on View network status and tasks at Network and Internet section to open the Network and Sharing Center.



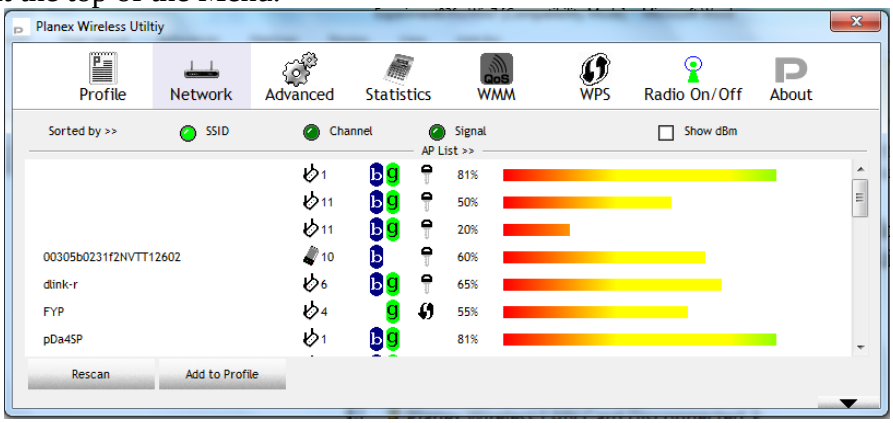
2. Click on the Change adapter settings to show the Network Connection. Right click on the Wireless Network Connection icon and select disable the internal wireless network adaptor as follow.



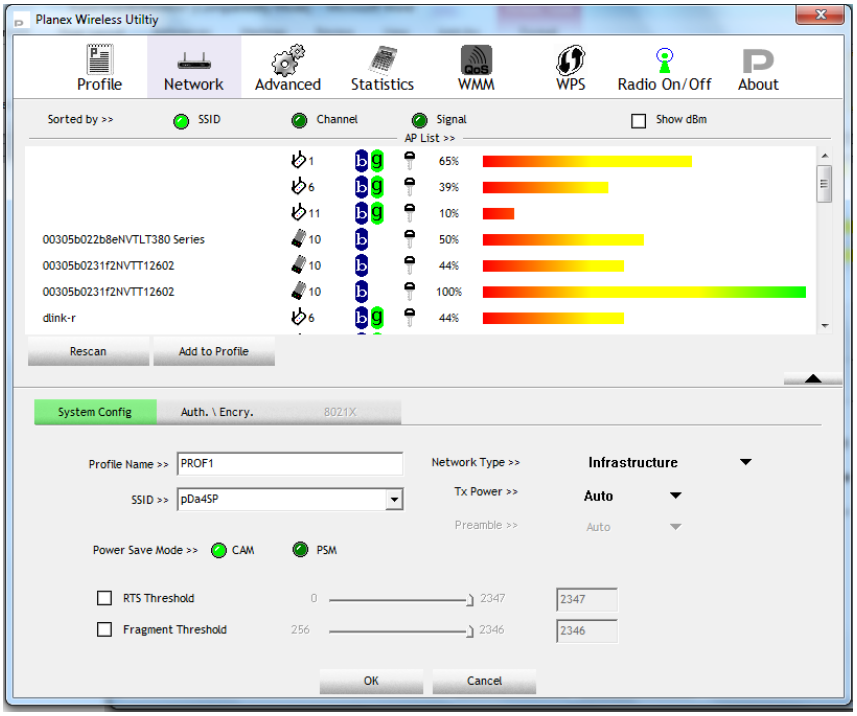
3. Plug in the Wireless LAN IEEE 802.11g Wireless Mini-USB Adaptor to one of the USB ports at the side of the laptop.
4. Since the Driver & Utility of the Wireless LAN IEEE 802.11g Wireless Mini-USB Adaptor **have been installed**, the utility program can be launched by clicking the icon at the bottom right hand corner of the system tray as shown in Figure.



5. Double click in the Planex Wireless LAN icon to launch the utility window and click on Network at the top of the Menu.

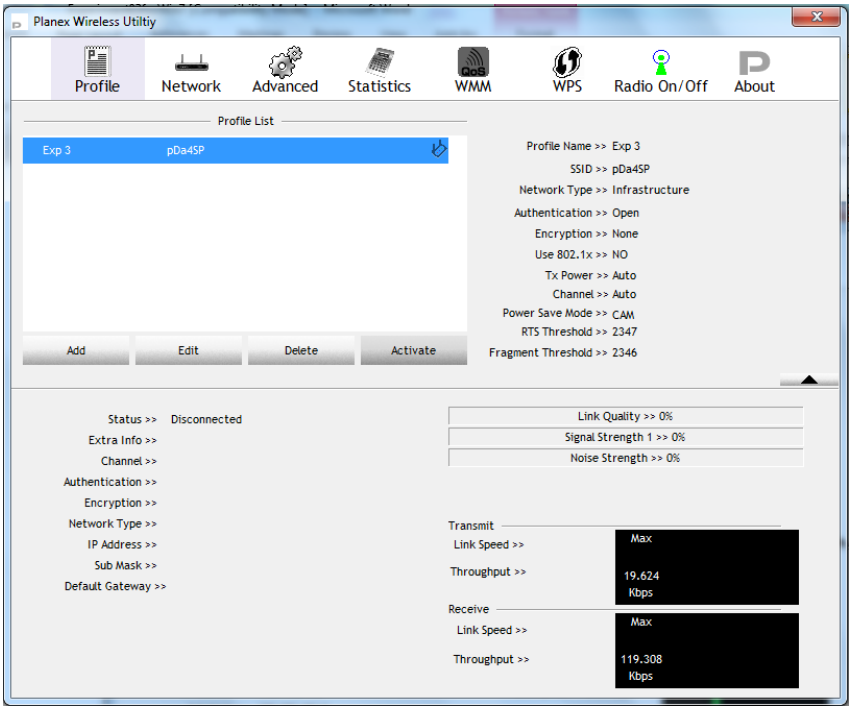


6. Set up a mobile hot spot using your smart phone. For example, SSID “pDa4SP” with your own password as shown in figure.
7. Select your SSID and click on the Add to Profile button to extend the Add Profile window as follow.

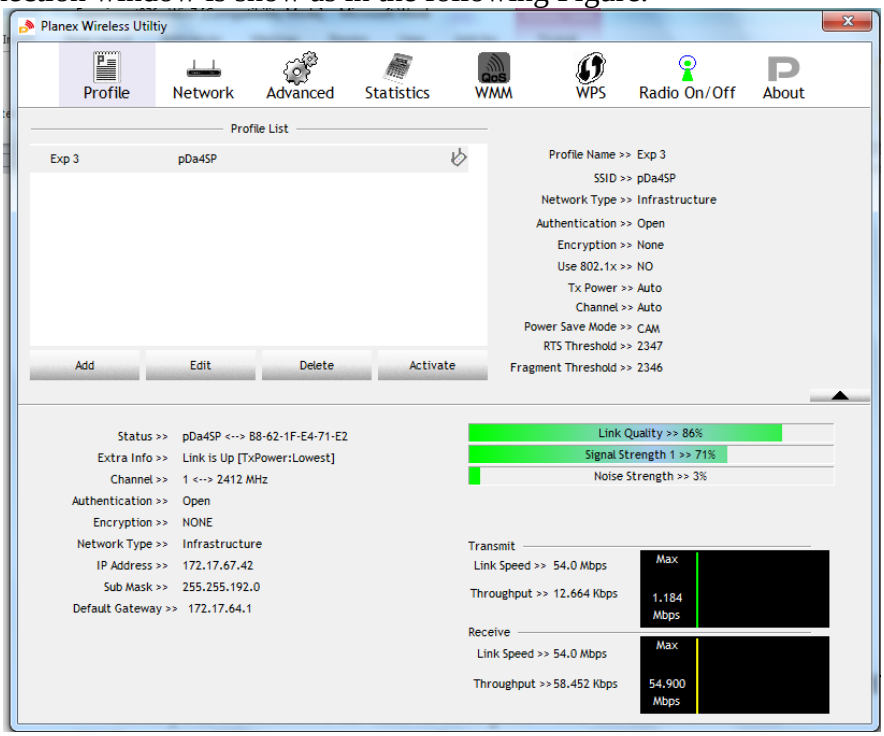


8. Then, define a new profile “Exp 3”, choose Network Type “Infrastructure”, Authentication “TKIP”, Encryption “your own password” and Tx Power “Auto” as shown in Figure below and click OK button.

9. Select the Exp 3 at Profile window and click on the Activate button.



10. The connection window is show as in the following Figure.



11. Once connected, launch Internet Explorer browser to access the Internet. You need to enter your Admission ID and SPICE password for Cisco wireless network authentication.
12. Enter any URL name to access the internet.

B. Setting up IEEE 802.11g Wireless LAN access point without security

1. Power up the Netgear wireless access point and press and hold the reset button at back of the router for 30 seconds to make default setting.
2. Connect the Ethernet straight UTP-5 cable from your laptop RJ-45 port to one of the four ports on your NetGear access point. (You also need to connect another straight UTP-5 cable from the Ethernet RJ-45 port on your access point to either your cable modem or ADSL modem. **This step is skipped in this experiment**.)
3. Go to start and run CMD program. Then, type "ipconfig/all to check the IP address of router to make sure that "192.168.0.1" (sliver color) or " 192.168.1.1" (white color) to check resetting of the router whether it is successful.
4. To configure your Local Area Connection **at the laptop** to a dynamic IP address. Click on Start, type Control Panel to be opened and click on View network status and tasks at Network and Internet section or click on the wireless icon at bottom right hand corner at Window System tray or right click, to open the **Network and Sharing Center**. Click on the Change adaptor settings. Right-click on the Local Area or Ethernet Connection and select Properties. Select Internet Protocol Version 4 (TCP/IPv4) and click on Properties button. Select "Obtain an IP Address automatically".
5. Then, at the CMD program type "ping 192.168.0.1" (sliver color) or "ping 192.168.1.1" (white color) to check the connection to the router whether it is OK.
6. Launch the Internet Browser to the following URL: http://192.168.0.1/start.htm for sliver color and http://192.168.1.1/start.htm for white color router.
7. If prompted for login, use username: **admin** and password: **password.**
8. Click on the *Setup Wizard*. Choose "No. I want to configure the router myself". Click "Next" button as shown in Figure 3 below.

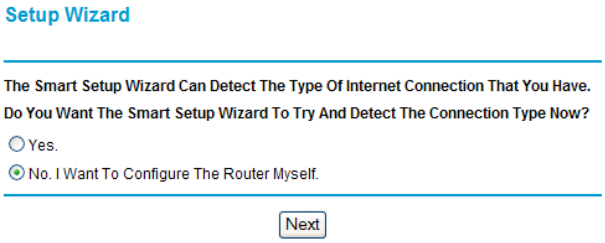
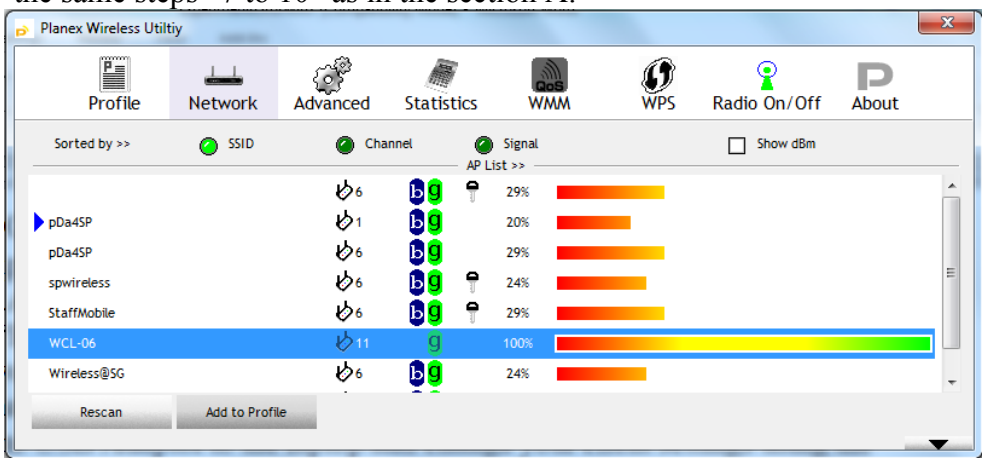


Figure 3

9. Click on the *Wireless Settings* and configure the following parameters:
   - Name (SSID): WCL-XX where XX follows the number on the access point.
   - Country: United States
   - Channel: Select any channel no. from 1 to 13 except channel 1, 6 or 11
   - Mode: g only
   - Security Options: Disable
   - Click "Apply" button.
10. Click on the *Advanced Wireless Settings*. Ensure that both "Enable Wireless Router Radio" and "Enable SSID Broadcast" are checked. Click "Apply" button.
11. Click on the *Advanced LAN IP Setup*. Change the IP Address of the router to 192.168.1XX.1, Starting IP Address to 192.1XX.2 and Ending IP Address to 192.1XX.100 where XX follows the number on the access point. Click "Apply" button.
12. Disconnect the Ethernet straight UTP-5 cable.
13. Make sure that the built-in wireless LAN adaptor must be remained disable and plug-in Wireless Mini-USB Adaptor to the laptop and change your client settings using the **Planex Wireless Utility** client software.

14. Connect your Wireless Mini-USB Adaptor client to **the new access point (WCL-XX)**. Follow the same steps "7 to 10" as in the section A.



15. Once connected, launch Internet Explorer browser to access http://192.168.1XX.1/start.htm where XX follows the IP of the access point.

D. Setup an ad-hoc WLAN

Ad-hoc WLAN uses only Adaptors to communicate with each other: there is no Access Point. There are four parts to this experiment:

(i) Power off all the Access Points/routers
(ii) Work out with other group to identify a network address
(iii) Change the configuration of the Adapter
(iv) Test out the wireless network.

1. Power off all the Access Points
2. For the ad-hoc network:
   Network IP address: _____
   SSID: _____
   Channel: _____
3. Configure the adaptor
   Change the Adaptor SSID to _____ and Channel to _____.
4. Testing the ad-hoc WLAN
   Test out the connections among the clients in the ad-hoc network.
   Can the client get connected to other ad-hoc network? Why?

   _____

E. Questions

1. Name the devices required to set up a Home/small Office network.

_____

2. Draw a sketch of the NetGear AP and indicating the type of connections available.

3. Draw a diagram to show how these devices are used to setup an infra-structure WLAN.

4. Draw a diagram to show an ad-hoc WLAN.

i. Conclusion

To setup a WLAN, the _____ is usually connected to a wired network.
On the client PC or notebook, a _____ is installed.
In order for a client to join a WLAN, its _____ and _____ must be set accordingly.