Lab 4
Design LAN using DHCP and Design LAN using Wireless Nodes

What is DHCP?

Dynamic Host Configuration Protocol (DHCP) is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

Wireless Network

A wireless local-area network (LAN) uses radio waves to connect devices such as laptops to the Internet and to your business network and its applications. When you connect a laptop to a WiFi hotspot at a cafe, hotel, airport lounge, or other public place, you're connecting to that business's wireless network.

Wired Network

A wired network connects devices to the Internet or other network using cables. The most common wired networks use cables connected to Ethernet ports on the network router on one end and to a computer or other device on the cable's opposite end.

Benefits Wireless Network

The benefits which can be obtained from a wireless network, including:

➢ **Convenience**: Access your network resources from any location within your wireless network's coverage area or from any WiFi hotspot.

➢ **Mobility**: You're no longer tied to your desk, as you were with a wired connection.

➢ **Easy setup**: You don't have to string cables, so installation can be quick and cost-effective.

➢ **Expandable**: You can easily expand wireless networks with existing equipment, while a wired network might require additional wiring.

➢ **Security**: Advances in wireless networks provide robust security protections.

➢ **Cost**: Because wireless networks eliminate or reduce wiring costs, they can cost less to operate than wired networks.

Aims of This Lab

➢ The aim of this Lab is to show how to configure DHCP Server within Local Area Network.

➢ The aim of this Lab is to show how to configure wireless nodes within Local Area Network.

➢ After this Lab, the Student can know how to configure wireless nodes within LAN.

Experiment Procedure

1. **Configure DHCP Server**

   ➢ Design a LAN consists of Four Computers and switch.
   ➢ Select Server.
   ➢ Add server to the network.
   ➢ Connect the server to the switch.
   ➢ Configure the server by doing the following steps:
      a) Go to desktop then IP.
      b) Give static IP address and subnet mask to the server.
      c) Go to config. and select DHCP from the list on left hand.
      d) Set the service on.
      e) Select starting address.
      f) Select number of users.
      g) Press save and remove the window.
   ➢ Go to PC0 and select desktop.
   ➢ Go to IP and select DHCP
   ➢ This server will give IP address to PC0.
   ➢ Repeat for all computers.
   ➢ Check your network.

2. **Wireless Network Design**

   ➢ Select wireless Devices and then go to Linksys router.

   ➢ Select two computers (generic).

   ➢ Go to PC0 and select physical then do the following actions.

     a) Turn off PC0.

     b) Remove the Ethernet port.

     c) Bring wireless port from the list.

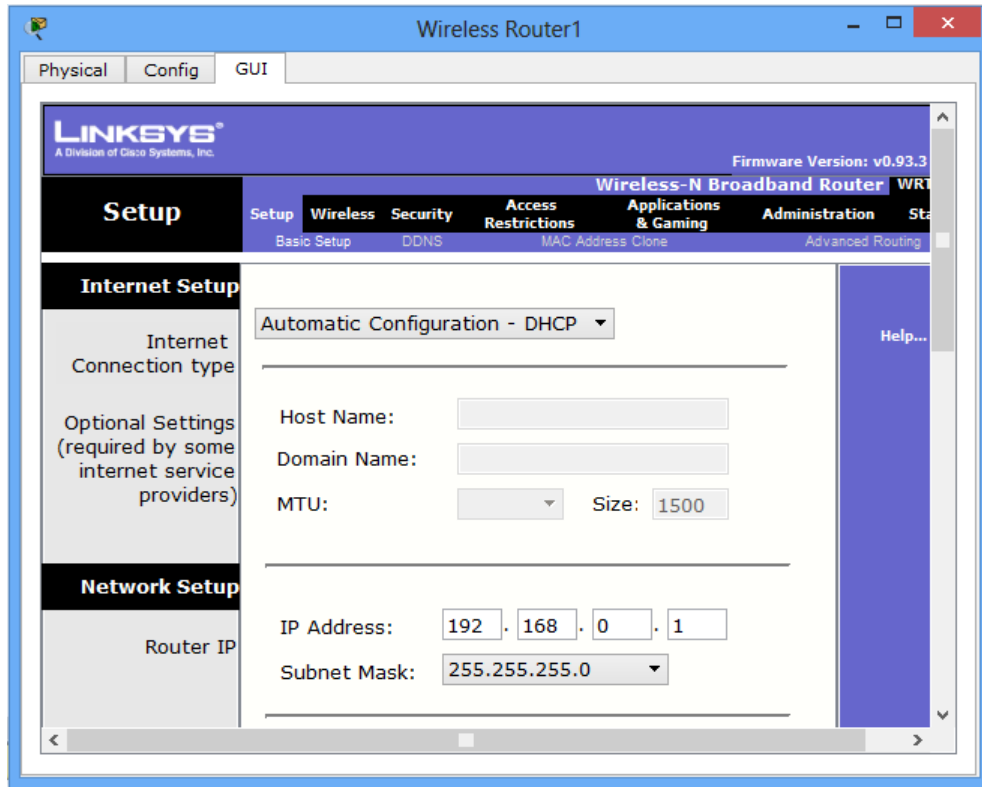   d) Turn on PC0.

➢ Here you must see the wireless connection between PC0 and the router.
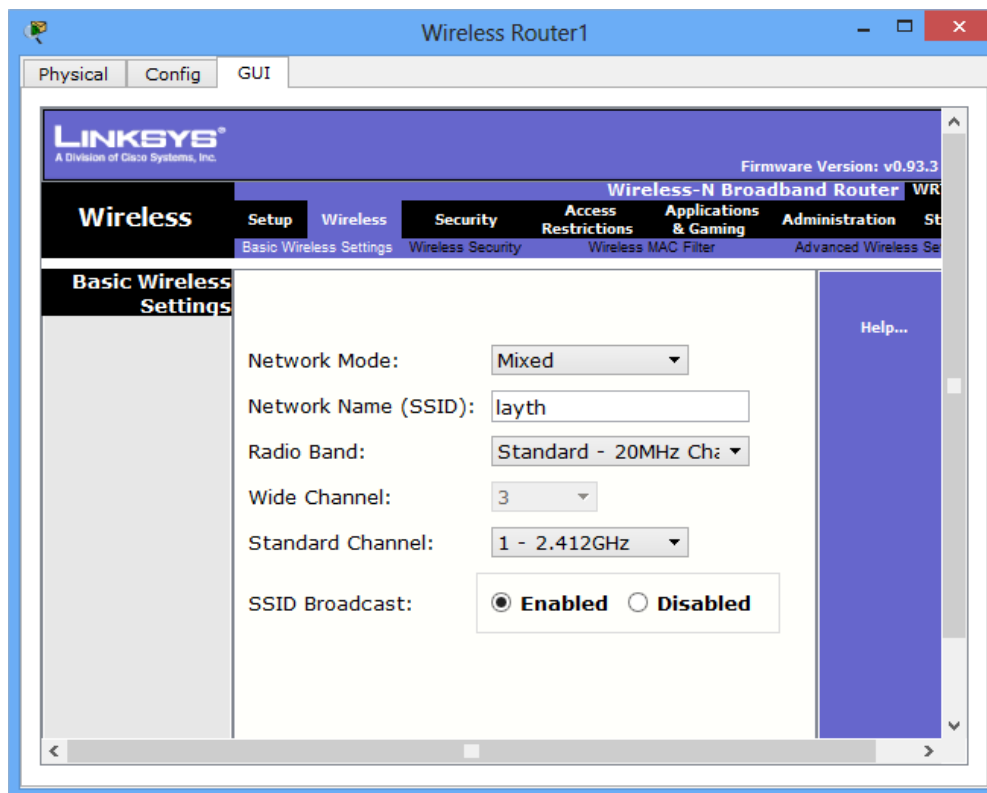
Configure Wireless Router

➢ Click on router and select config. you will see the following window.
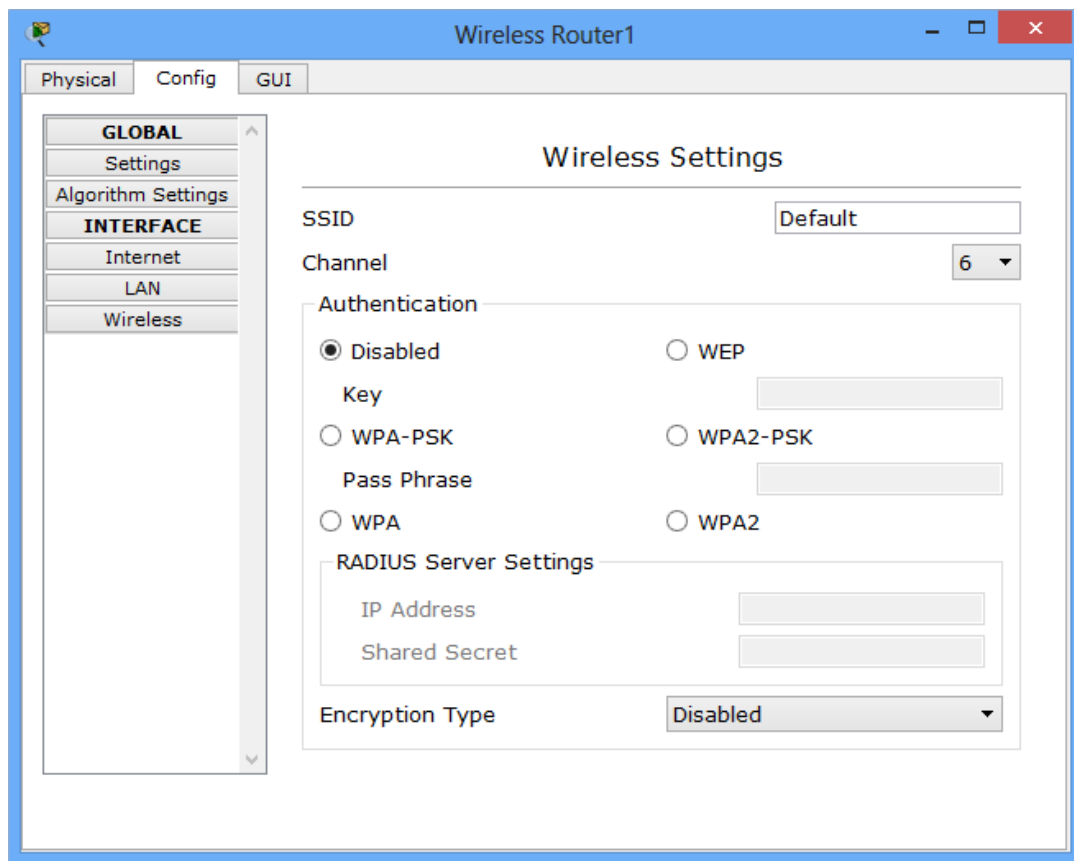
➢ Enable WEP from Authentication.

➢ Put ten **HEX** codes in key space.

➢ Go to GUI and you will see the following window.

➢ Select wireless then you will see the following window.

➢ Change network name (you can give any name such as your name).

➢ Click save setting and remove this window.

➢ Go to PC0 and select desktop then select **PC wireless** then you will see the following window.

➢ Press connects from the menu then you will see the following window.

➢ Press connects then you will see the following window.
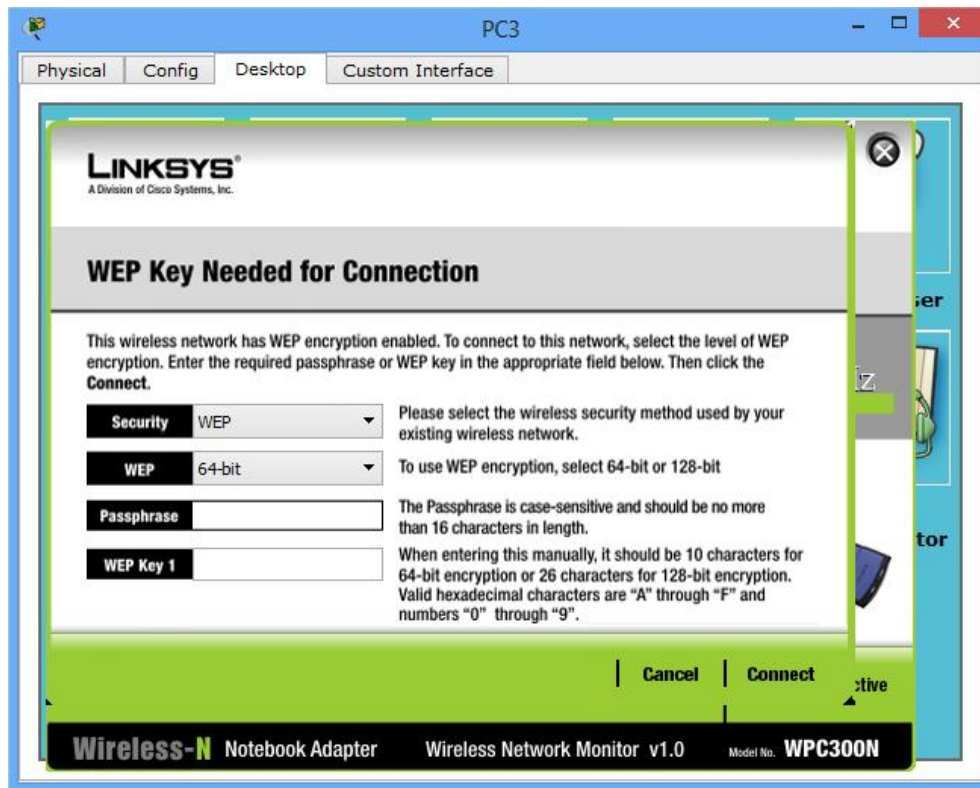
➢ Insert your password (the ten **HEX** codes) in WEB key 1 space.

➢ Press connects and then removes the window.

➢ Repeat this procedure to the next computer and try to ping each other.

➢ Put PDU on PC0 and PC1.

➢ Go to simulation and select only ICMP protocol the try to play your model.

Questions (put the answer in your report)

1. What is the main function of DHCP server?

2. When we must use DHCP Server?

3. What is a wireless network?

4. How is it different from a wired network?

5. What are the main benefits of using wireless network?