**CSIS2270 - Lab #2**

20

***Introduction to Home Router Configuration***

***Due: 11:59 PM January 23rd, 2021***

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**Introduction:** This lab introduces the basic networking commands and the configurations of DHCP service and wireless service on a Home Router.

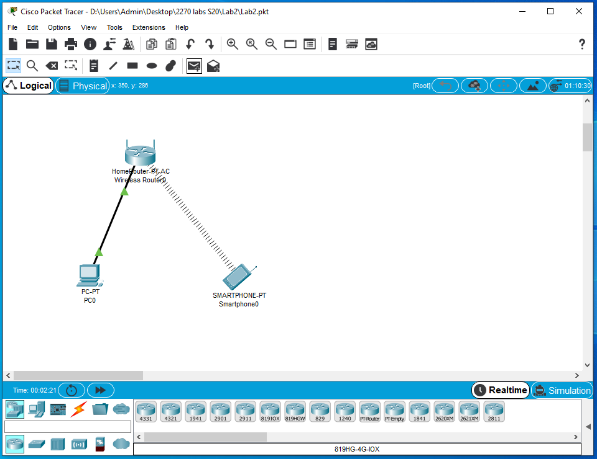
**Objectives:**

1. To get familiar with the basic networking commands.
2. To get familiar with router configurations.

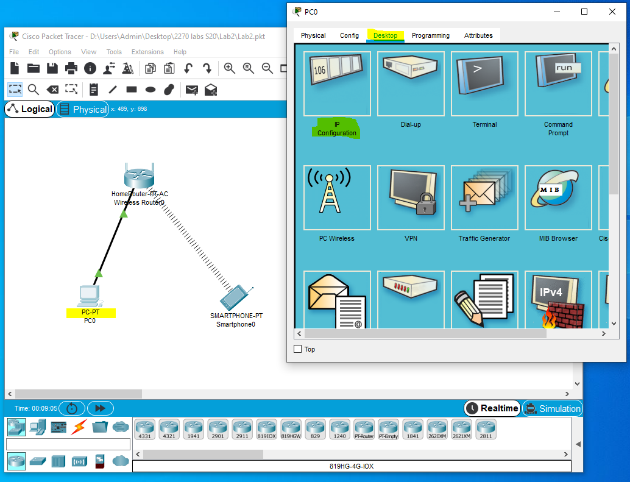
**Equipment Required:**

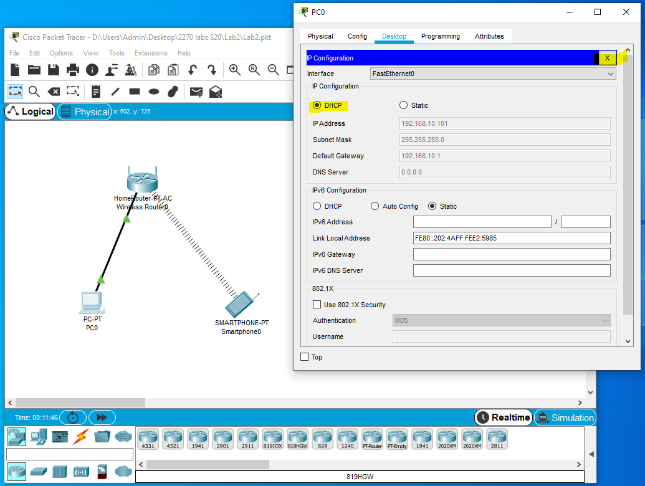
* PC installed with Cisco Packet Tracer program

1. **Network Address [\_\_\_\_\_/2]**
2. Start Packet Tracer (log in if asked to do so) and drag a PC , Home Router and a Smart phone to the workspace
3. Connect the PC to the Home Router with a straight network cable.

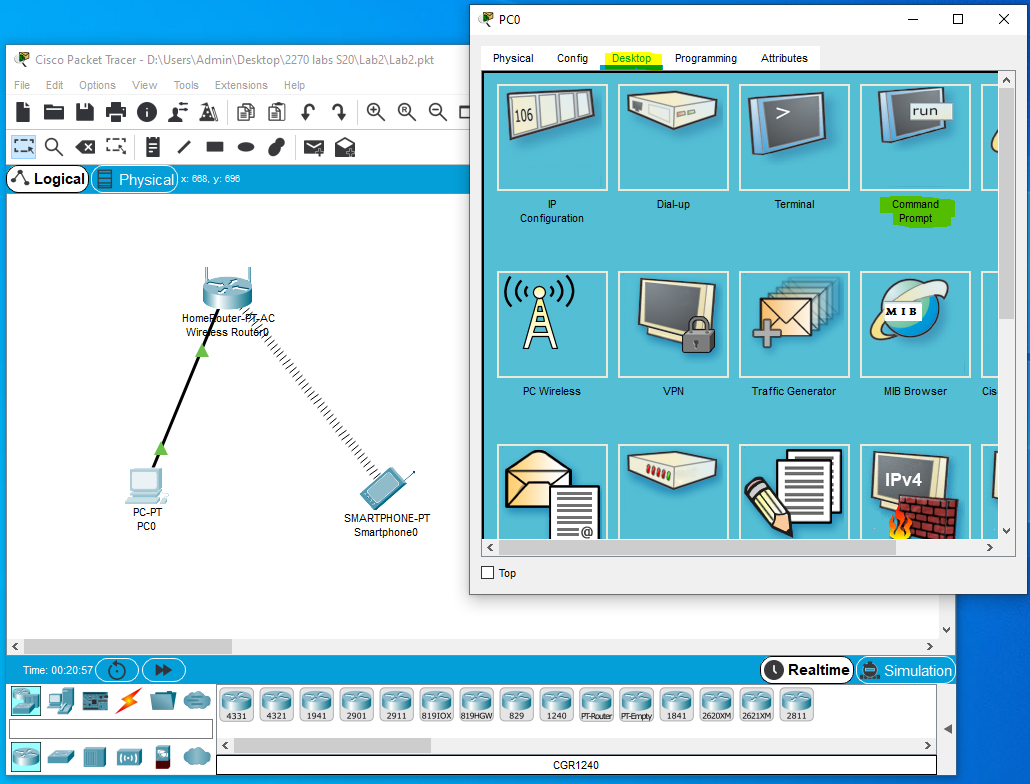


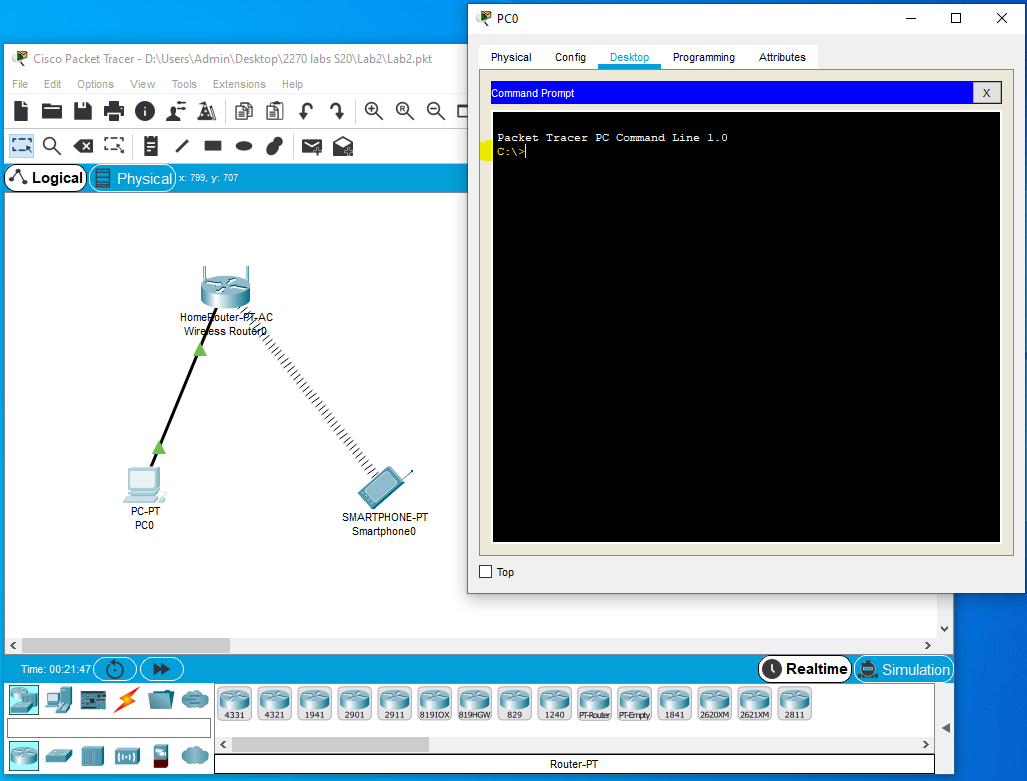
1. Click on the PC and click on Desktop menu and from the top menu bar find the IP Configuration icon and click it then click on the DHCP radio button to select it, then click the X button to close the window.





1. On the Desktop menu from the top menu bar find the Command Prompt icon and click it and you will get the ***cmd*** of the PC.





1. Enter the command ***ipconfig*** after C:\> prompt.
2. What is the IP address of your machine? **192.168.0.101**
3. What is the IP address of the Default Gateway? **192.168.0.1**

(Note that the Default Gateway is the router that the PC is connected to.)

1. Enter the command ***ipconfig /all***
2. What is the physical address (also known as the MAC address) of the Ethernet adapter?

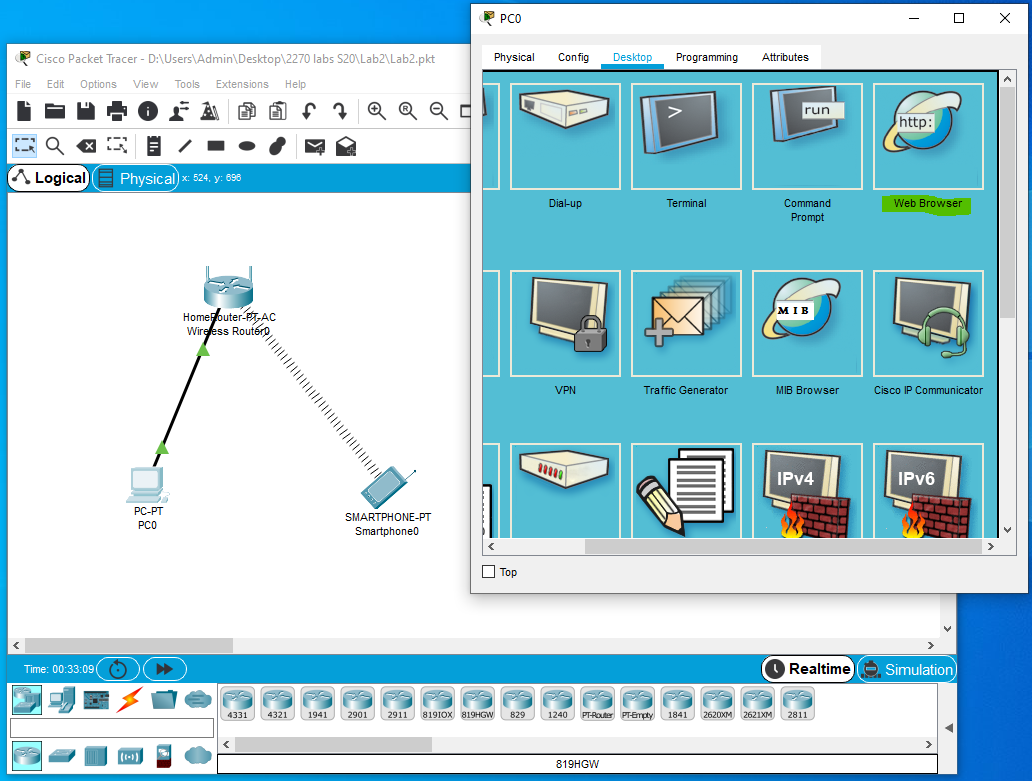
**MAC address: 00D0.FF33.5DE6**

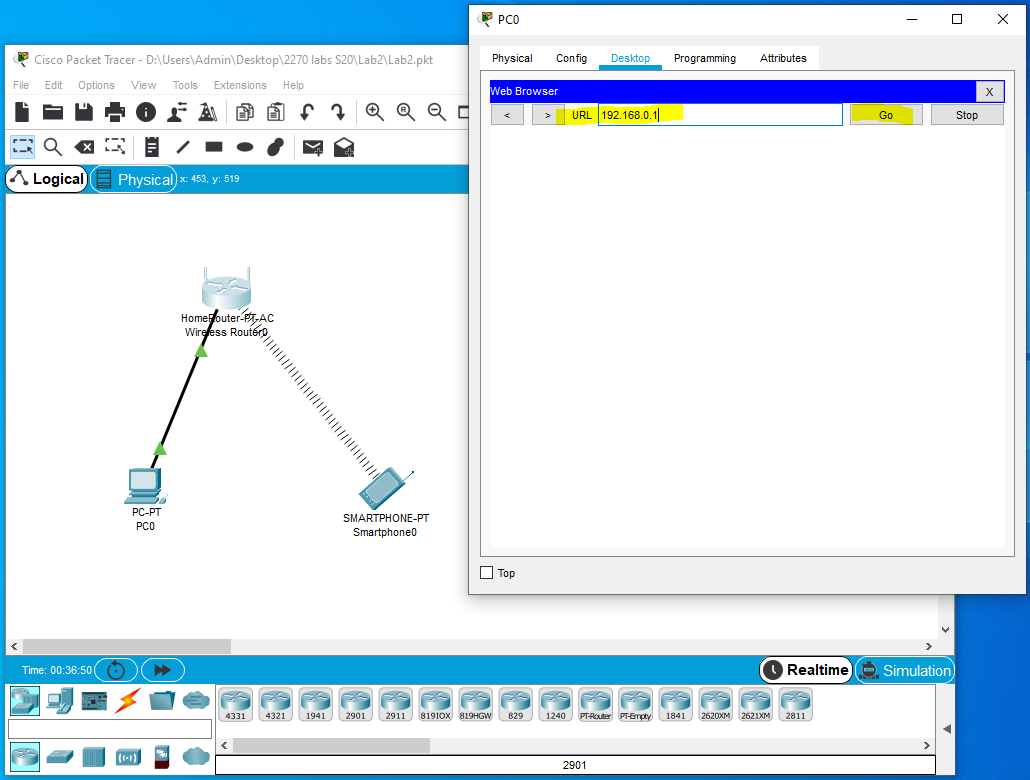
**B. Router Configuration – DHCP Server**

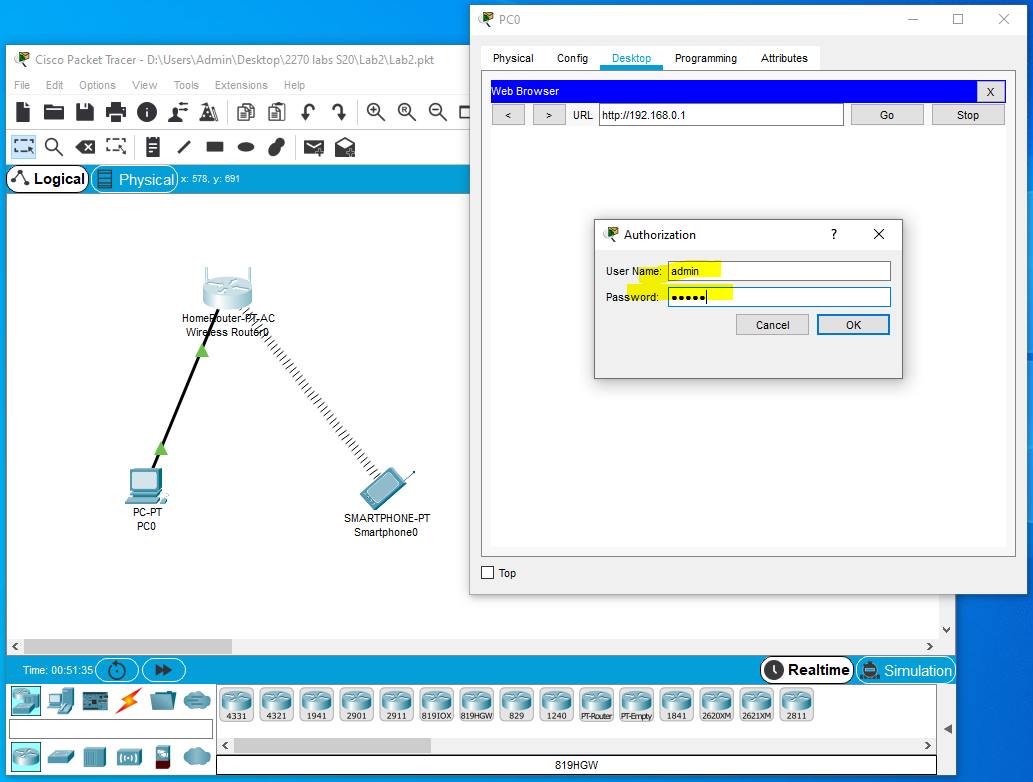
In the above configuration, the router uses the ***Dynamic Host Configuration Protocol*** ***(DHCP)*** service to assign IP addresses to machines connected to the network. The network administrator can set the IP address range to be assigned or alternatively, he can turn off the DHCP server and configure IP address to each machine manually.

**B.1 [\_\_\_\_\_/4]**

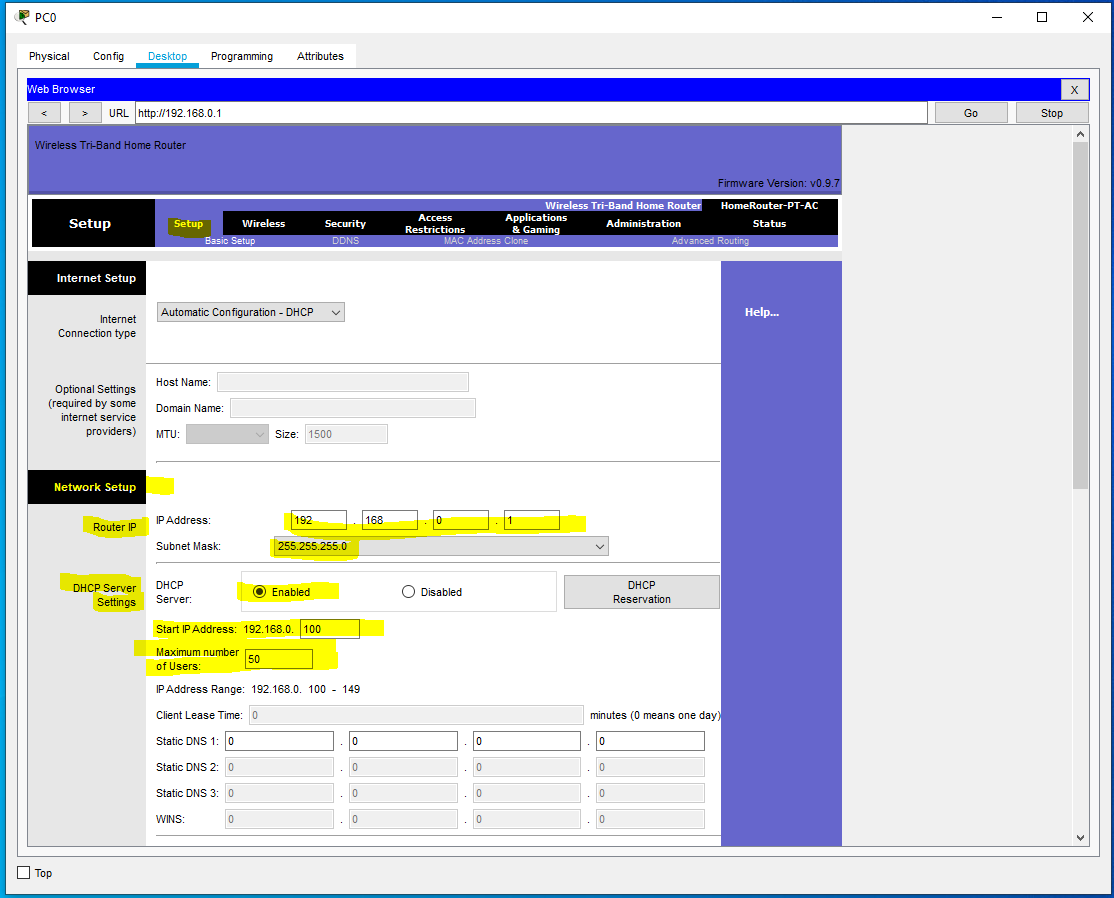
1. Logging into the Home Router
2. Click on the PC and then click on Desktop. Click on the web browser icon and type the Gateway IP address in the URL box and click Go. Use “***admin***” user name and “***admin***” password and click OK. (note that if the Gateway IP is not correct you will not get the log in dialog)







1. Current settings of DHCP server. From the top menu bar click Setup.



1. Check the Network Setup/Router IP and DHCP Server Settings
2. What is the IP address and the subnet mask of the Home Router ? **192.168.0.1** , **255.255.255.0**
3. What is the start address used by the current DHCP server? **192.168.0.100**
4. What is the maximum number of users that the current DHCP server can support? **50**
5. How long is the client lease time (an IP address is assigned to a machine for this period of time, and if a renew request has not been received before the lease expires, the address can be assigned to other machine)? **0 minutes (0 means one day)**
6. Changing the DHCP server settings
7. Edit the Home Router address to 192.168.10.1 and click Save Settings at the bottom of the Setup window. What you will notice? **The Home Router Setting window disappeared**

Why? **Because the Home Router current IP address has been changed.**

1. Open the PC web browser icon and type the new Home Router IP address 192.168.10.1 in the URL box and click Go to connect to the Home Router again ( use the same username and password)
2. Open the Command Prompt and use the command ***ipconfig /release*** to remove the IP address obtained previously.
3. Use ***ipconfig*** to check if the IP address has been removed, if not, repeated the above step again.
4. Use ***ipconfig /renew*** to obtain a new IP address from the Home Router.
5. What is the IP address of your PC now? **192.168.10.101**

**B.2 Manual Configuration of IP addresses [\_\_\_\_\_/4]**

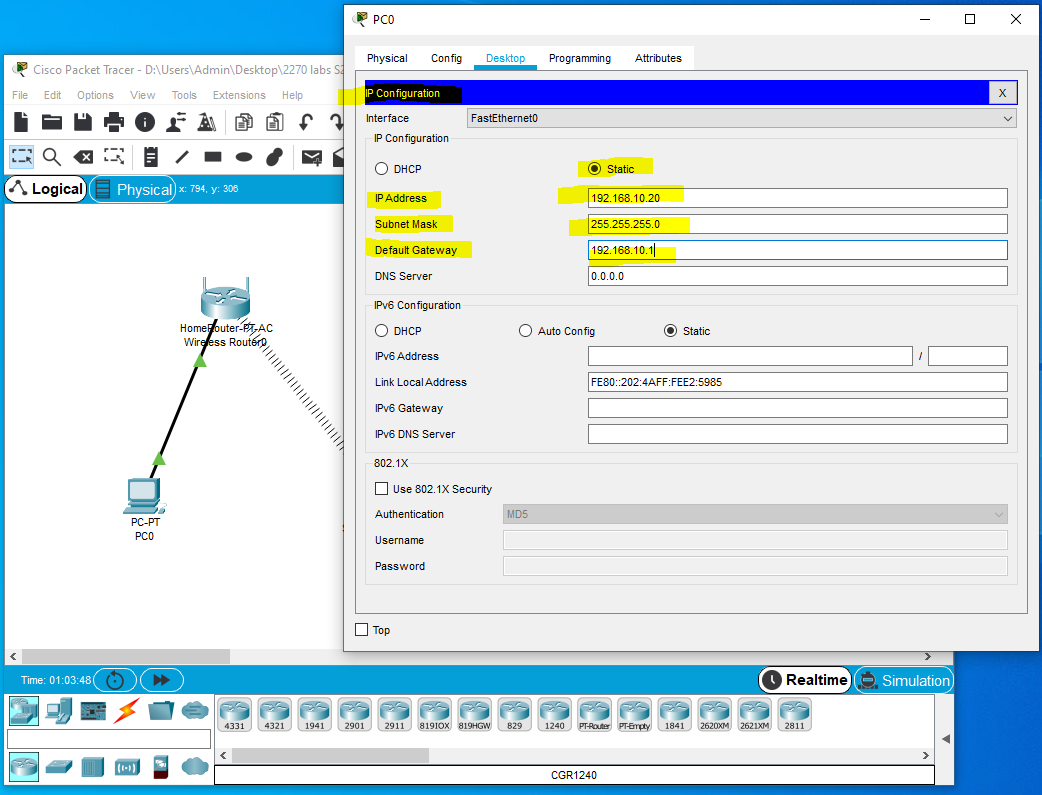
1. While connected to the Home Router, disable the DHCP server on the Home Router by checking the Disabled radio button. Click ***Save Settings***.
2. In the command prompt window of the PC , use ***ipconfig /release*** to remove the IP address of the PC
3. Can you still connect to the router? **No**
4. If you cannot connect to the router, what is the reason? **The DHCP was disabled in the Home Router.**
5. Manual configuration of IP address on a PC with DHCP server disabled.
6. On the PC IP Configuration window click on Static radio button
7. Enter the following settings

IP address: 192.168.10.20

Subnet mask: 255.255.255.0

Default Gateway: 192.168.10.1

1. From the PC Command Prompt window, use ***ipconfig*** to verify your settings.



**B.3 [\_\_\_\_\_/4]**

1. Switching back to DHCP service.
   1. Enable the DHCP server on the Home Router (now you must know how to do it.)
   2. Configure the (network adapter on the) PC to use DHCP service by following the steps in A2 above and select .
   3. What is the IP address of the PC? **192.168.10.101**
2. DHCP Reservation
3. On the Home Router, under Network Setup/DHCP Server Settings, click DHCP Reservations.
4. What are the devices MAC and IP addresses of the machines that are connected to the Home Router?

**MAC: 00:09:7C:B0:40:49 IP: 192.168.0.100**

**MAC: 00:D0:FF:33:5D:E6 IP: 192.168.10.101**

1. Check the ***Select*** box of your PC and click ***Add Client***. Your device will be assigned with the same IP address every time it connects to the network.
2. Click ***Remove*** to remove the DHCP reservation.

**C. Router Configuration – Wireless Network [\_\_\_\_\_/2]**

The dual-band Home Router supports both 2.4 GHz and 5 GHz bands. While you can assign the same SSID for both networks, you can also use them as two separate networks to better manage the traffic. It has been suggested that the 2.4 GHz band to be used for basic internet tasks such as web browsing, email, and downloads, and the 5 GHz band for streaming multimedia. Note that not all 802.11n adapters support dual bands as some only operate at 2.4 GHz.

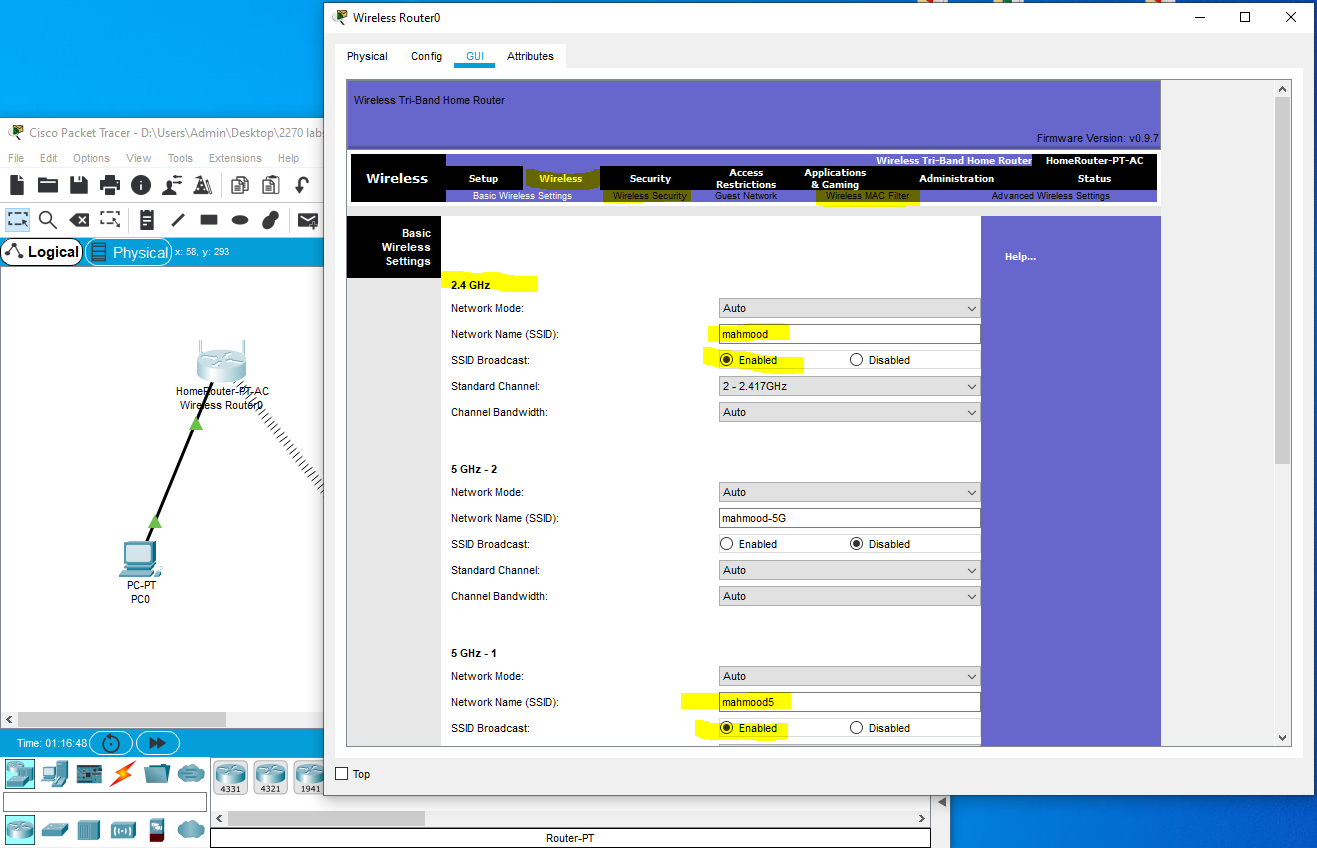
1. Connect to the Home Router using the web browser and click ***Wireless***.
2. Click on Basic Wireless Settings. Edit the 2.4 GHz network with the following settings:

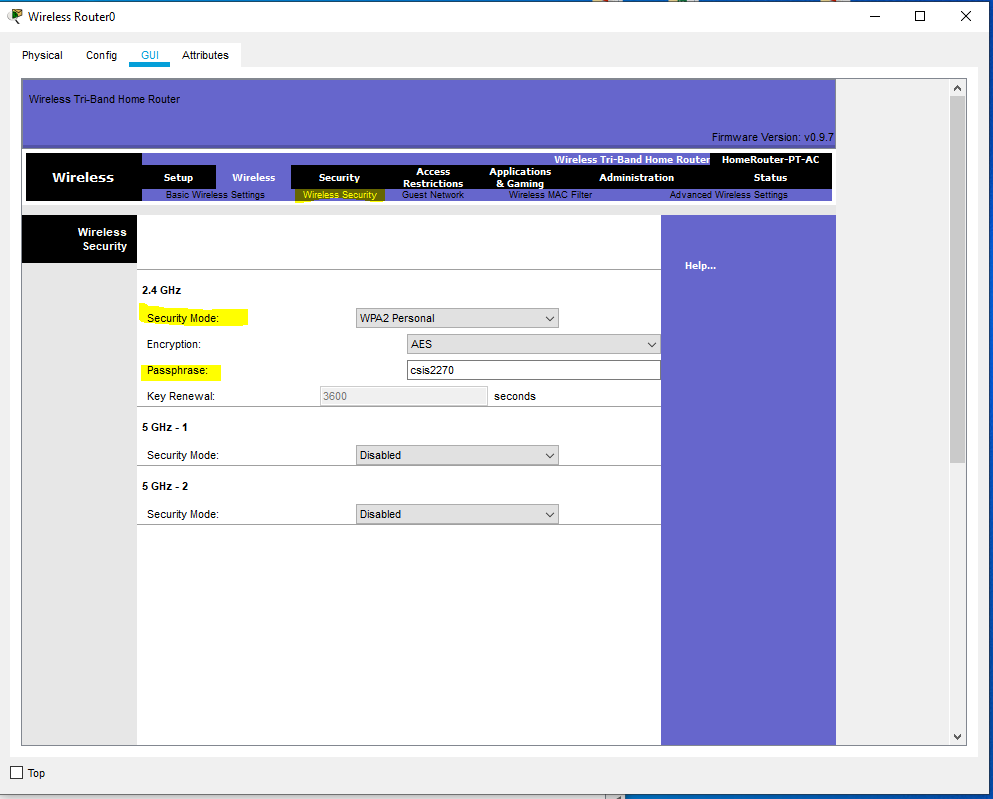
Network name: your\_first\_name (*e.g. Rupa*) , click Save Settings

Security mode: Click on Wireless Security and select WPA2 Personal for 2.4 GHz

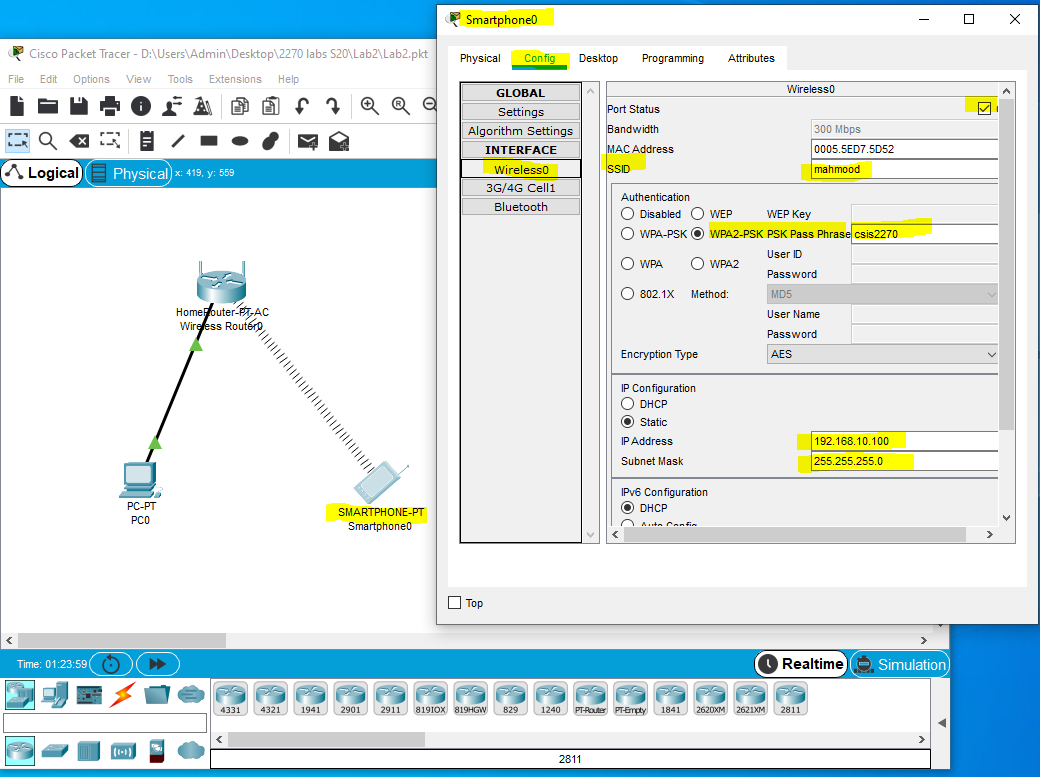
Use Passphrase: **csis2270**

Leave the others unchanged, and click Save Settings



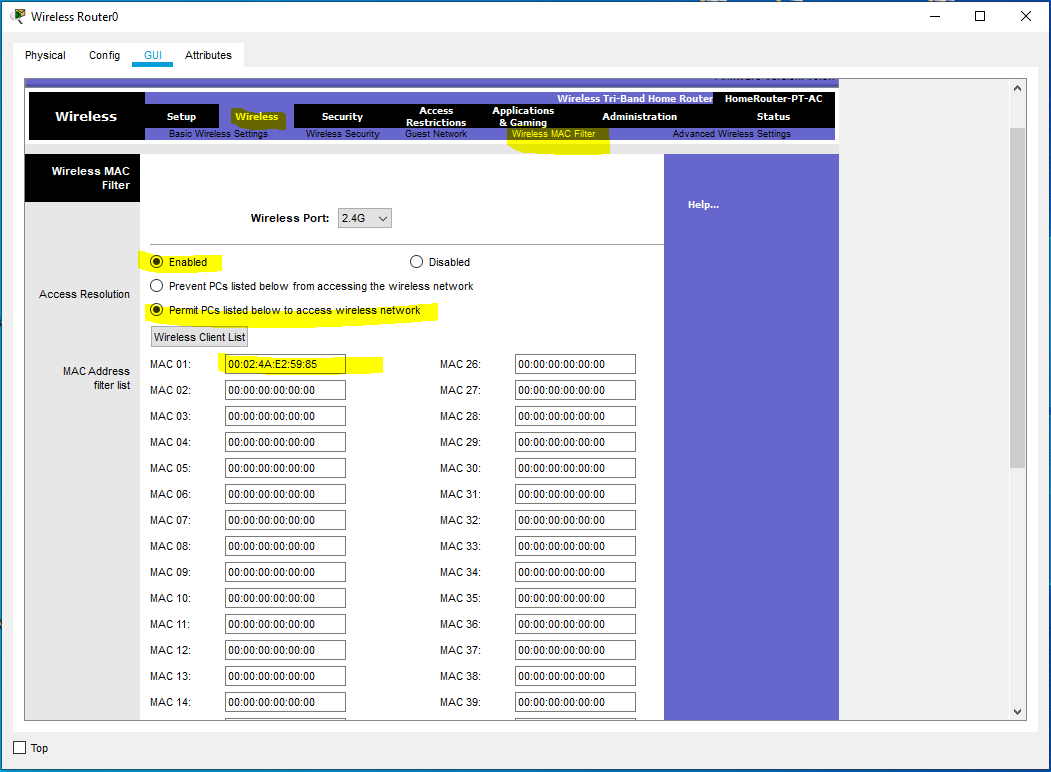


1. Go back to basic wireless settings, edit the 5 GHz network with Network name: your\_first\_name5 (e.g. **Rupa5)**, , click Save Settings
2. Use the smartphone to see if you can connect to the wireless networks.
3. Can you connect to the 2.4 GHz network? **YES** (on the smartphone use Rupa for SSID , select WAP2-PSK and **csis 2270** for passphrase)
4. Can you connect to the 5 GHz network? **YES** ( on the smartphone use **Rupa5** for SSID, Authentication disabled)



**D. Router Configuration – Network Security by MAC filtering [\_\_\_\_\_/4]**

Besides using WPA2, another way to protect your wireless network is by mean of MAC filtering. Every network device has a unique, 12-digit *MAC* (Media Access Control) address. Using MAC filtering, you can allow only known MAC addresses (known devices) onto your network. You can also exclude specific MAC addresses and deny their access to your wireless network.

1. Using ***ipconfig /all***, determine the MAC address (physical address) of the Ethernet adapter of your PC. The MAC address is **00:D0:FF:33:5D:E6**. (e.g. 00:23:18:fc:7c:87)
2. On your Home Router, go to Wireless > Wireless MAC Filter > check ***Enabled*** for Wireless MAC Filters
3. Select ***Permit PCs listed below to access wireless network***
4. Add in the MAC address of your PC (note: separate every 2 digits by a colon “**:”** ).
5. Click Save Settings
6. Use the smartphone and try to connect to your wireless network. Is it successful? **NO, However, if you try to connect with the 5GHz network, you can, because the filter was not applied to it.**
7. Disable the MAC filtering and use the smartphone to try to connect to the network again. Is it successful? **YES**
8. ~~On the Home Router, click~~ ***~~Device List~~***~~. Which devices are connected to the network?~~

**Lab Submission instructions:**

1. Save your report file as yourFirstnameLastname\_yourID\_Lab2.docx.  
    (example: RupaManabala\_1234\_Lab2.docx)
2. Save your Packet Tracer file as yourFirstnameLastname\_yourID\_Lab2.pkt   
    (example: RupaManabala\_1234\_Lab2.pkt)
3. Put both files ( .pkt and .docx) in one folder and name it as   
    yourFirstnameLastname\_yourID\_Lab2 (example:RupaManabala\_1234\_Lab2)
4. Compress the folder into a zip file
5. Submit the compressed zip file no later than **11:59 PM** of January 23rd, 2021 on **Blackboard.** (**Do not send labs by email please. Any lab submitted by email will be ignored**).
6. **Late submissions will NOT be accepted or graded.**
7. **Students who do not save lab files with proper names as indicated in 1,2,3 above, will lose 50% of the lab’s mark**.