PRACTICAL LAB: WIRELESS NETWORK CONFIGURATION 2

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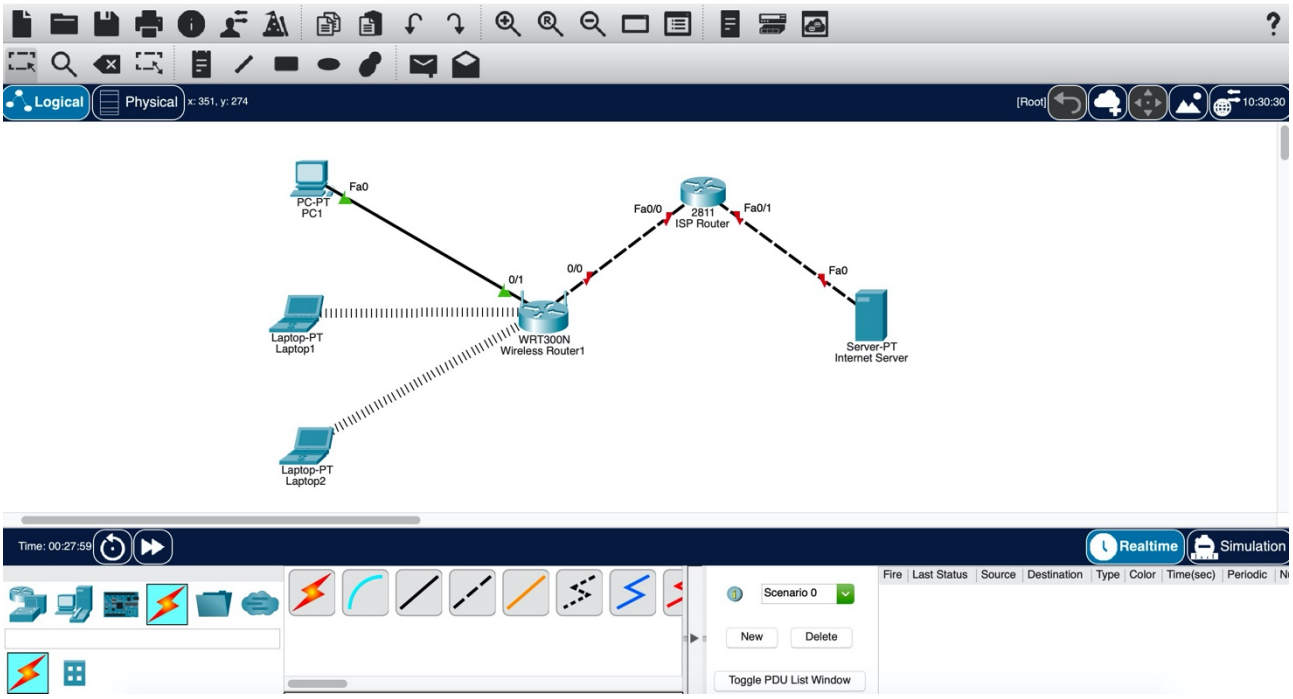
1 Introduction

For this practical we will be using *Cisco Packet Tracer (student edition)*, a tool provided by Cisco to build and test Cisco networks. We will be setting up a wireless network with multiple devices, and configuring them so that there is WPA security, an ISP router connected to an internet server, and then implementing MAC address filtering. In our network, we will have two laptops and a PC which should connect to a local area network (LAN) provided by a wireless router. The PC connects to the LAN via an Ethernet port of the wireless router while the laptops should connect to the same LAN wirelessly. Further, the LAN needs to connect to the internet via an ISP Router.

2 Setting Up Devices

Open Packet Tracer and add the following devices: a wireless router, two laptops, a PC, a generic server (name it 'Internet Server') and a 2811 router (name it 'ISP Router'). For the laptops, you will need to install a wireless adapter module. See configuration below:

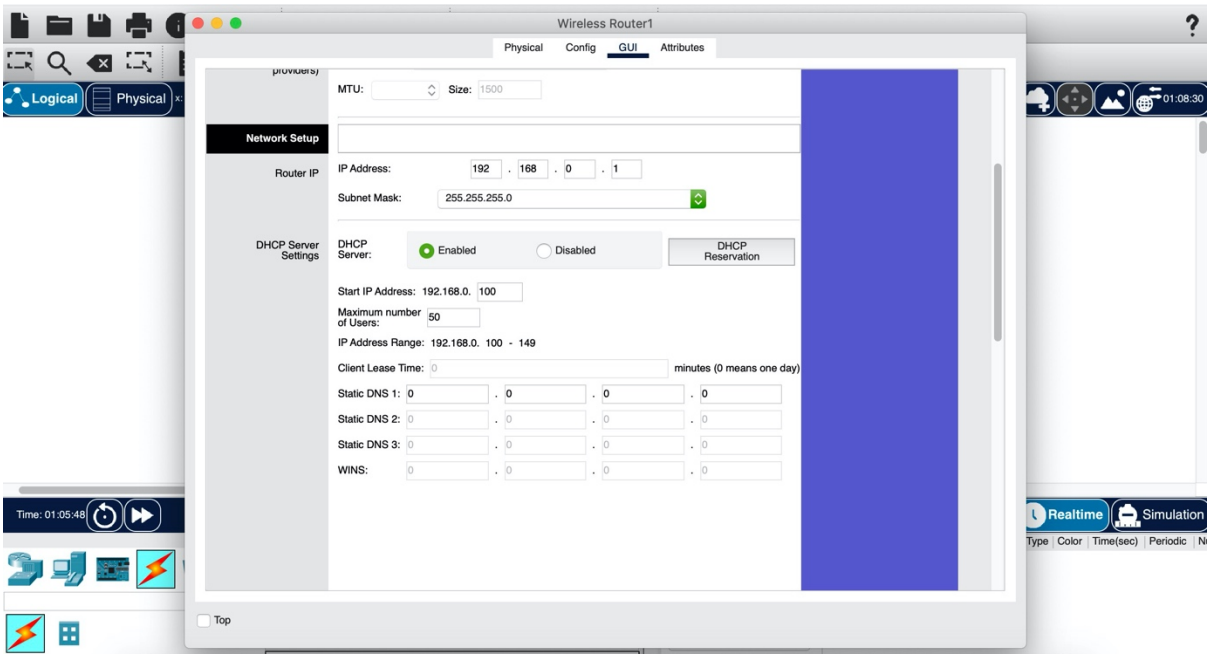


By default, the wireless router should have the following settings:

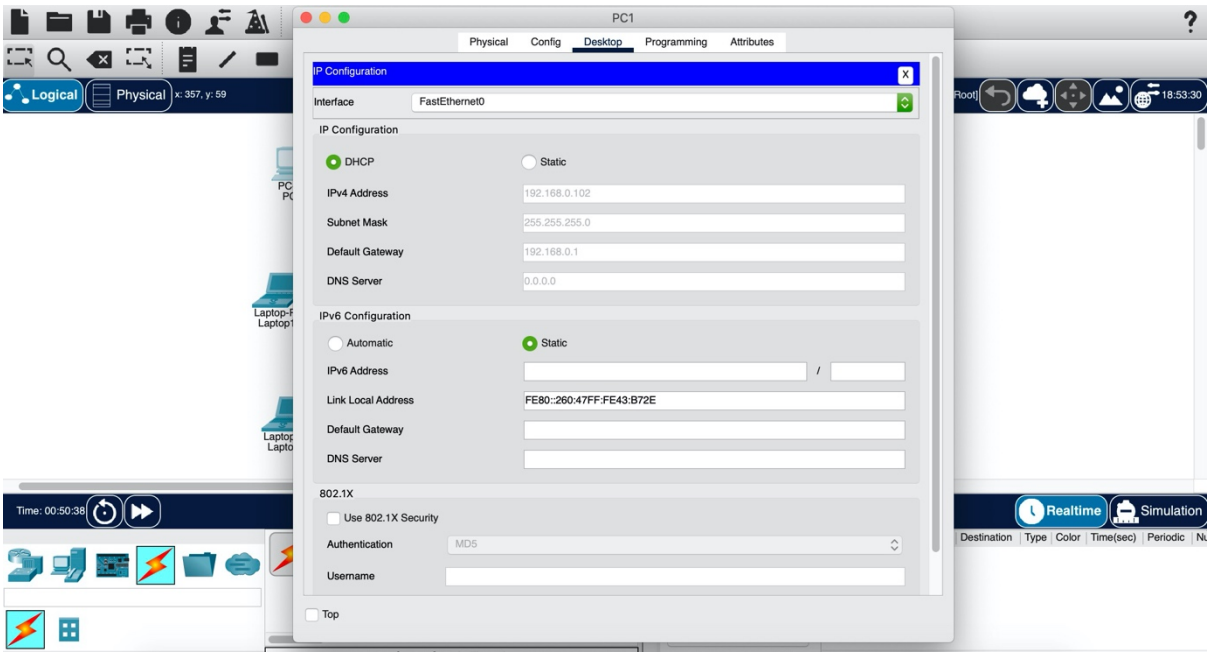
- DHCP (dynamic host configuration protocol) is configured automatically and enabled on Wireless router
- Router IP Address of 192.168.0.1
- IP pool for the router is 192.168.0.100 to 192.168.0.149

Further, no security should be configured, and the default SSID is configured to Default.

There should also be an automatic password under the GUI tab, and more specifically the 'administration tab'. This will be blocked out as ***** but the default is 'admin' for both the username and password.



Finally click on one of the devices. Click on config, and then wireless. You will see that the laptops are already configured to receive IP from the DHCP Server. However, we need to enable DHCP for PC1. Therefore, on PC1 – go to desktop, and for IP configuration, click DHCP. The PC will then automatically be assigned an IP address from the wireless router.

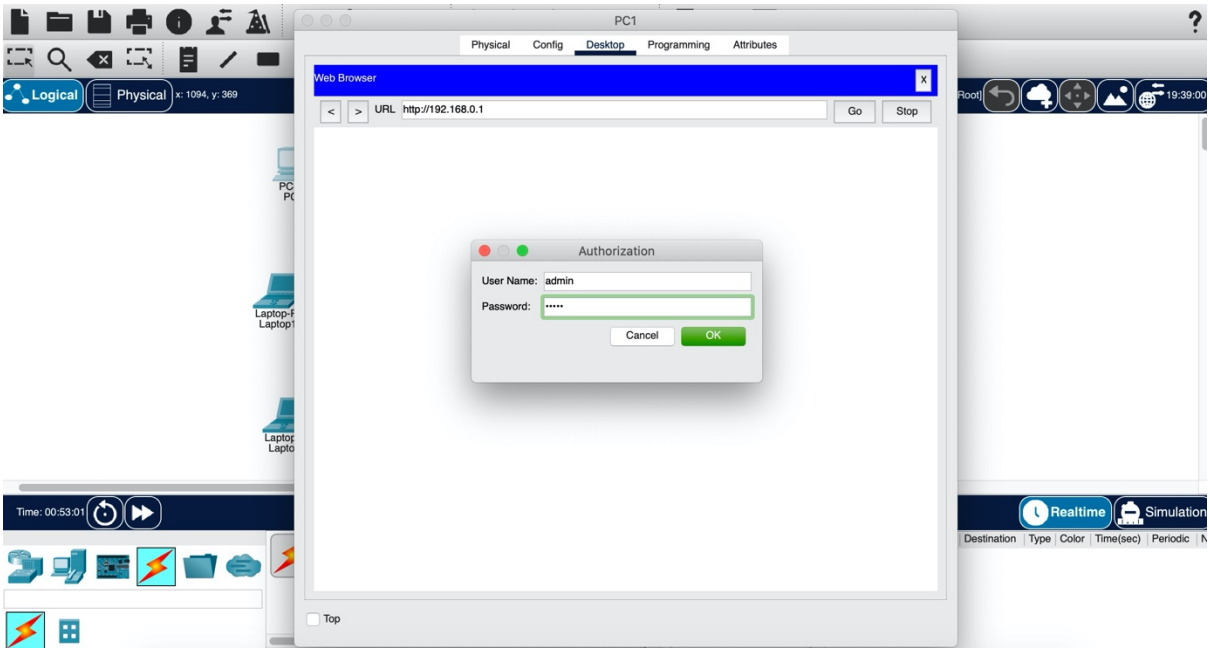


3 Wireless Router Administration

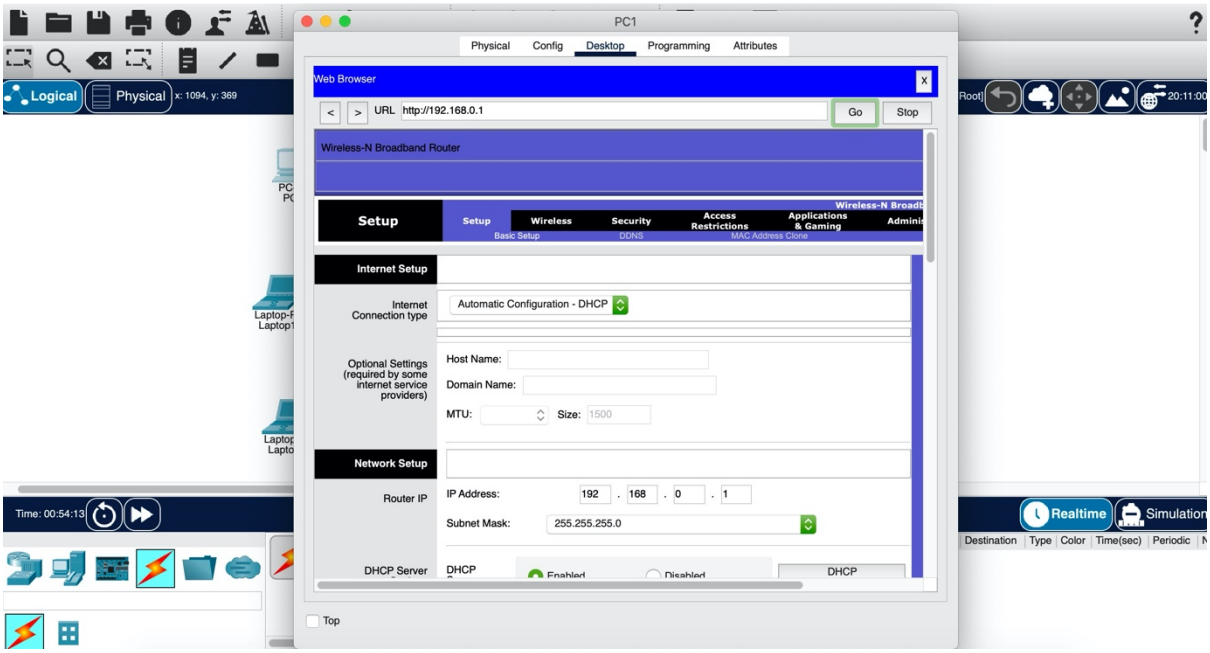
Next, we are going to configure some settings on the wireless router to create a LAN and then connect it to the internet. To do any configuration on the wireless router, we'll use its GUI (Graphical

User Interface) which we can access either by clicking on the wireless router or through a browser on a PC or laptop.

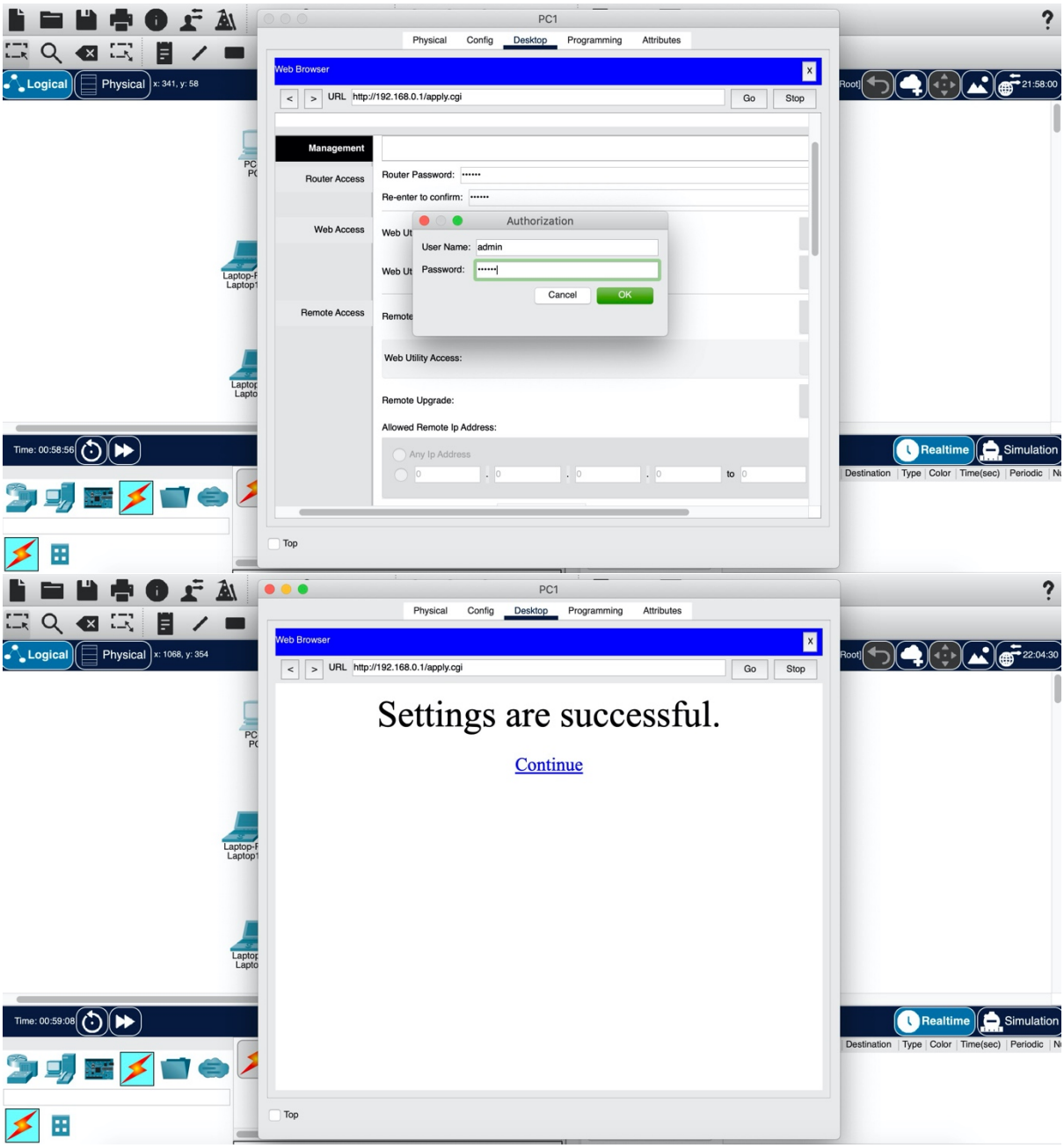
Using PC1, go on to the web browser, and enter the IP address of the LAN interface of the wireless router (192.168.0.1 by default), and hit go. A login prompt will appear so provide the username and password and click OK.



You should now be in the GUI of the router:



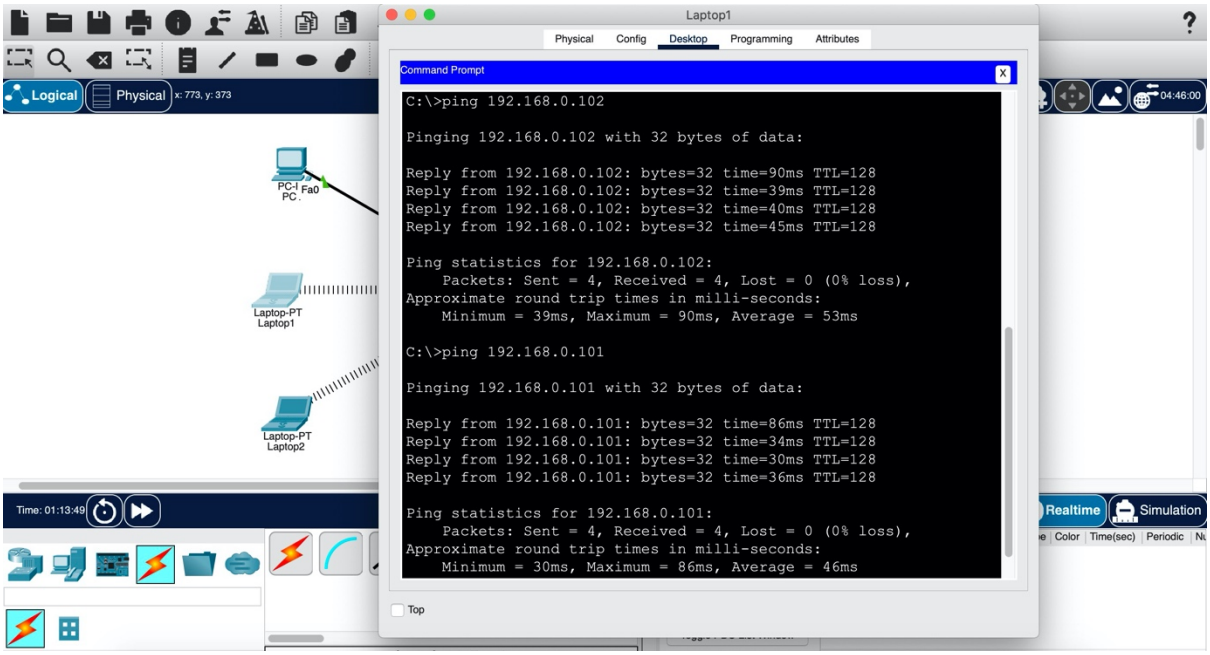
Click on the 'Administration' tab and set a new password for administrative access. Scroll down and Save settings. You will be prompted for a username and the new password you just set. Type them in and click OK. You can click on continue to continue with configurations.



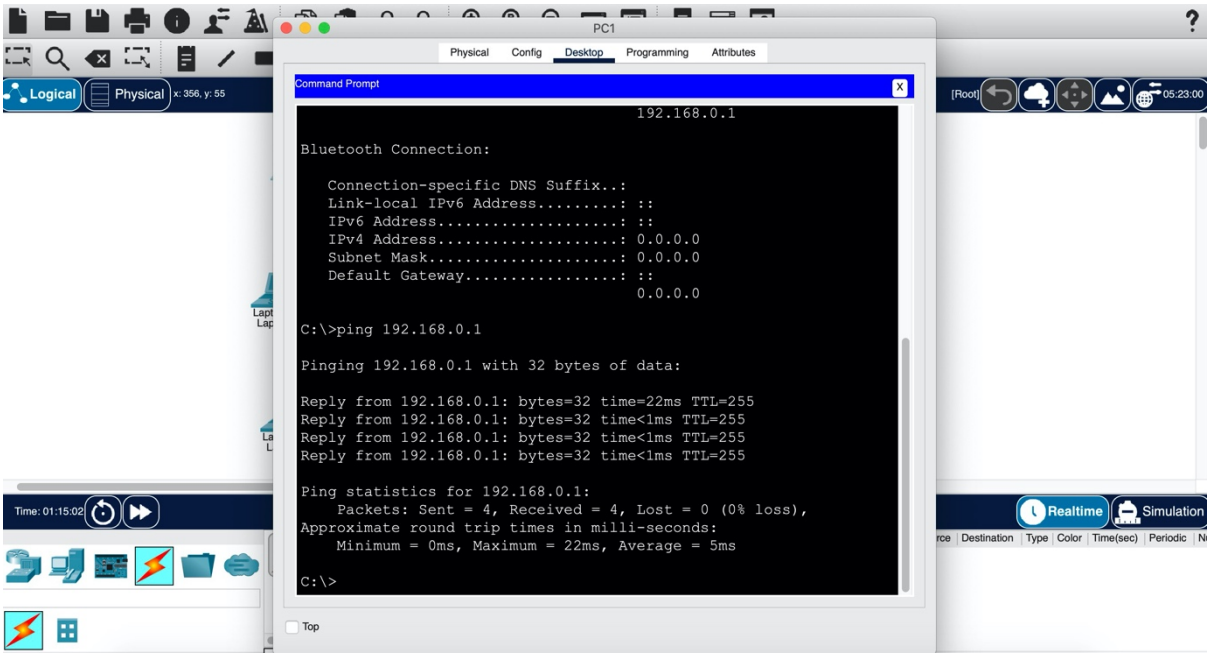
To test for the new password entered, close the browser of PC1 and try to access the GUI again using the browser. You'll now have to provide the new password you have just set.

4 Network Testing (so far)

Ping Laptop2 and PC1 from Laptop1. Both pings should succeed.

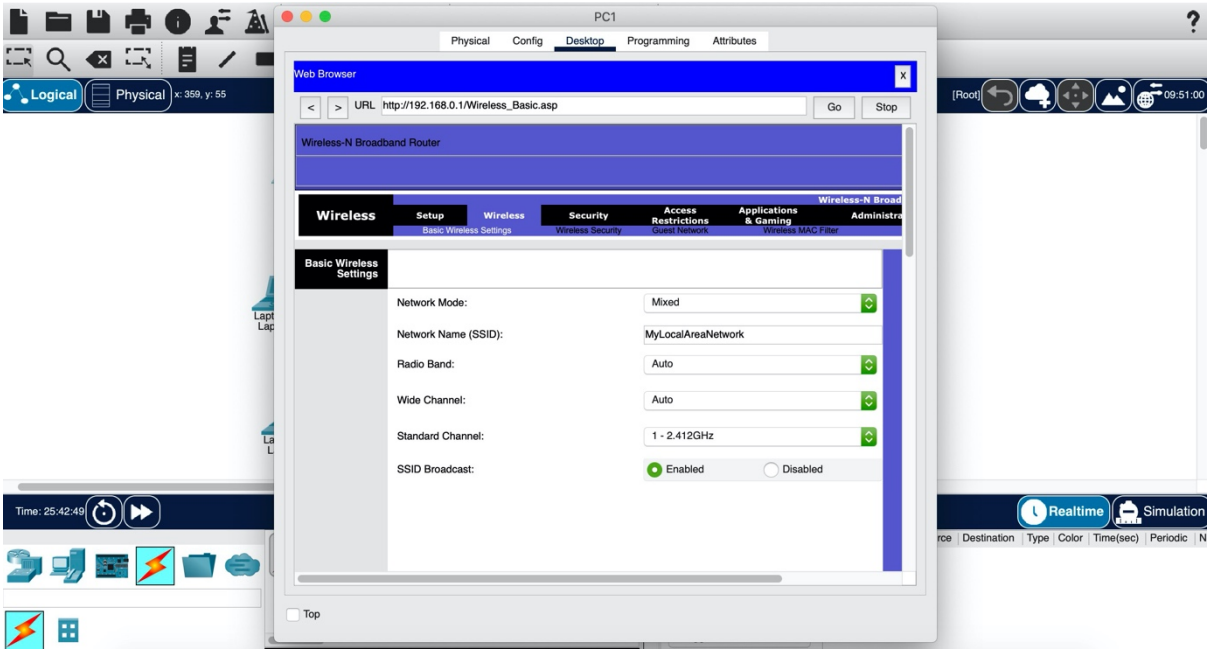


Try to ping the LAN interface of the router from PC1. It should be successful.

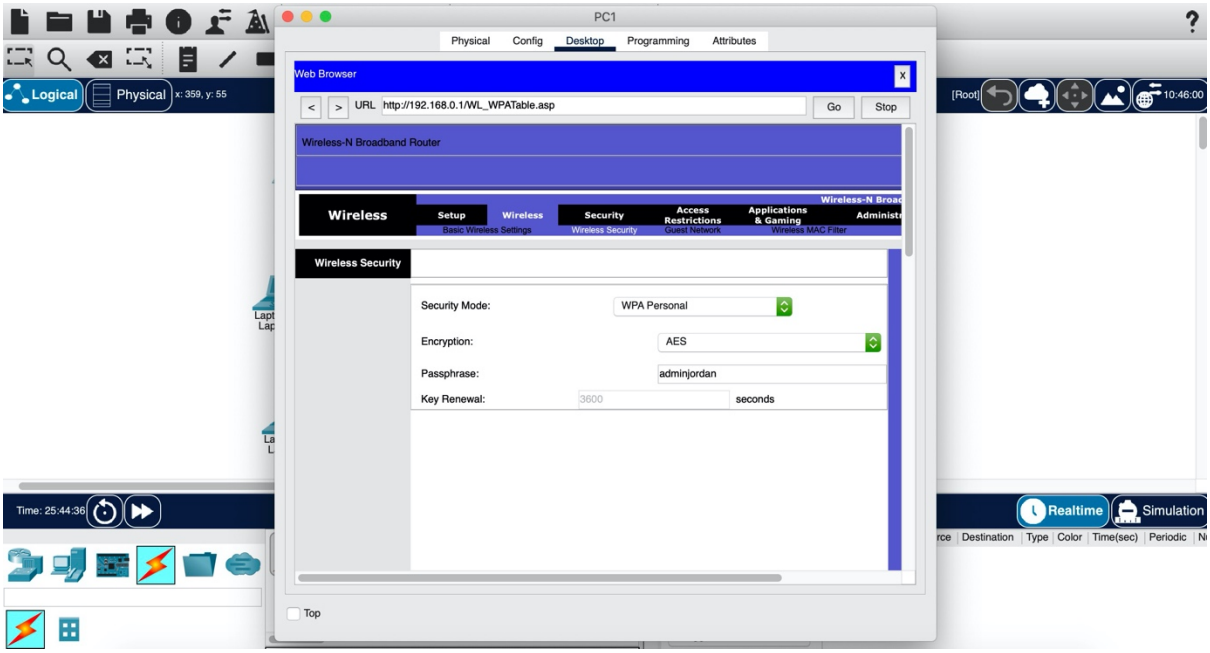


5 Adding Wireless LAN Security

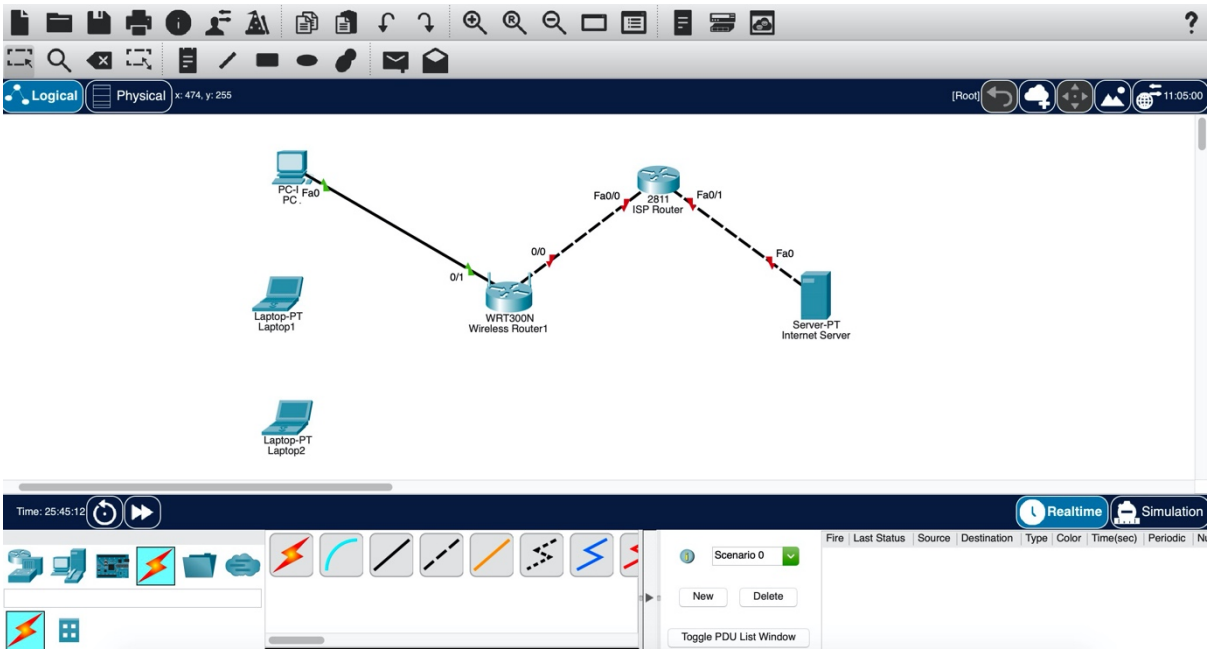
The LAN network setup has no wireless security features enabled so this requires changing. Access the GUI of wireless router and click on Wireless tab. Under ‘Basic Wireless Settings’ change the default wireless SSID to any name of your choice, such as ‘MyLocalAreaNetwork‘ as seen below. After this, don’t forget to scroll down and click on ‘Save settings’.



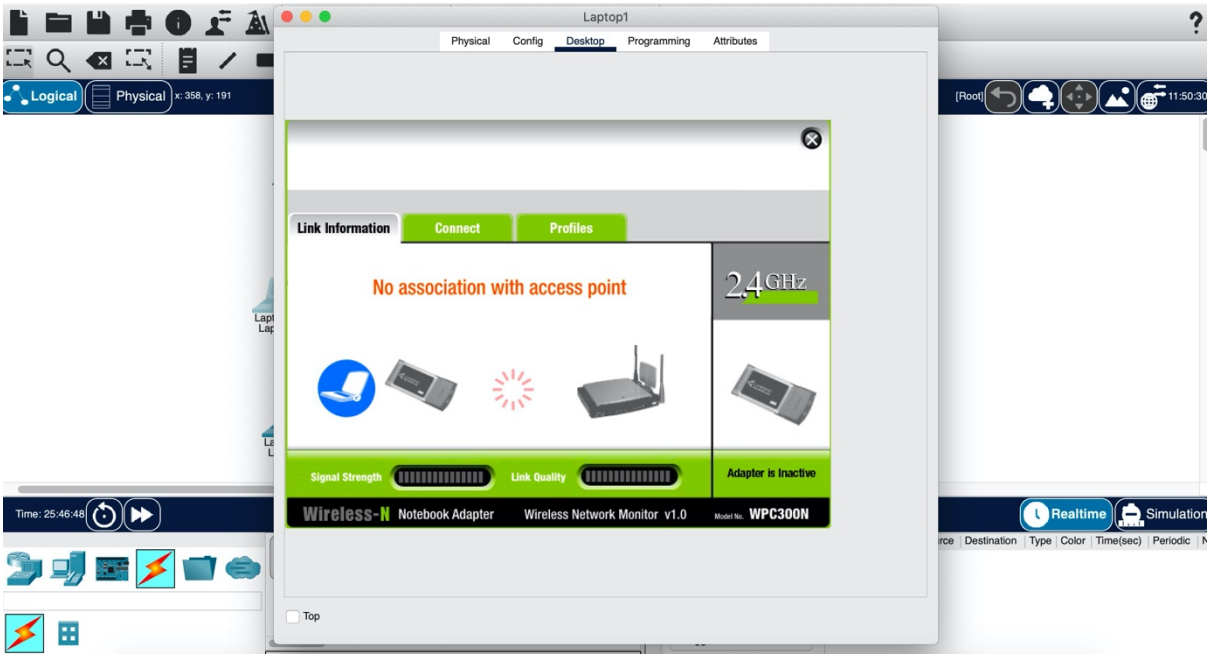
Furthermore, under 'Wireless Security, change the security mode to 'WPA Personal', and set the passphrase field to a password of your choice. Scroll down and click on 'Save settings'.



Once you have done this, the laptops should now not be connected, as below:

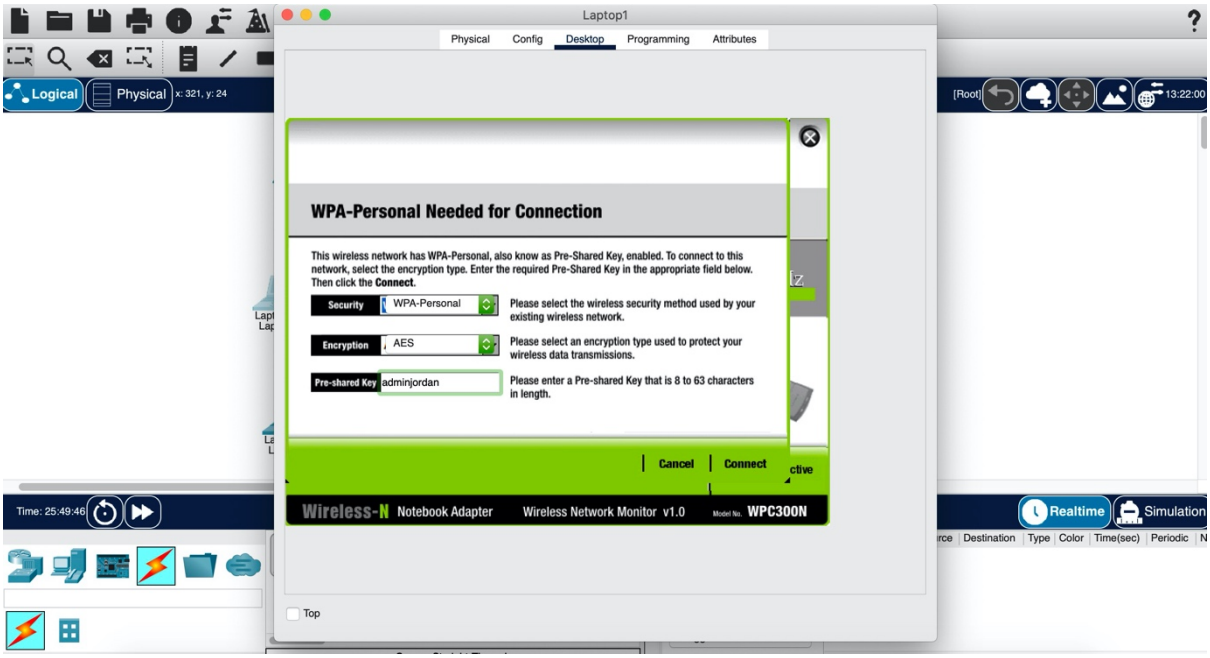


The LAN network is now secured for wireless access. To test whether it is really protected, click on Laptop1, go to Desktop, and then 'Wireless'. A new window appears that shows the now secured wireless network.

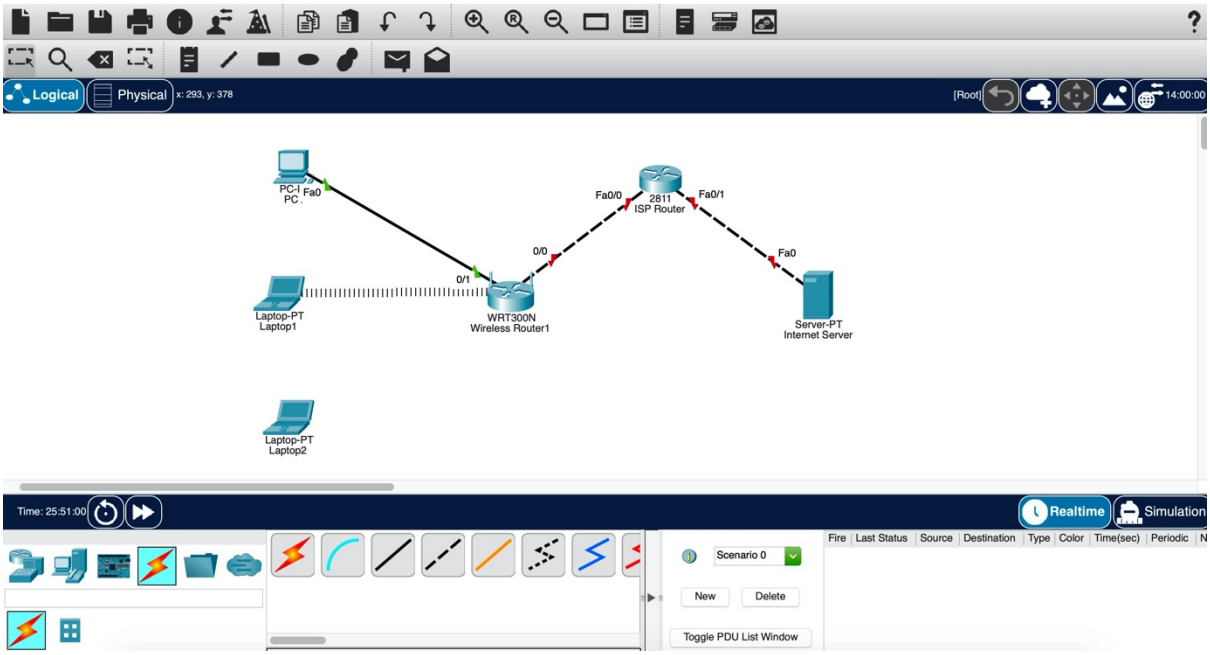


Click 'connect'. You can now see the name of the wireless network (MyLocalAreaNetwork, in this case), its signal strength, and other features such as WPA1 PSK security.

Again, click 'connect', then provide the security pre-shared key for the Wi-Fi that you set, then 'connect'. Laptop 1 is now connected to the wireless network.



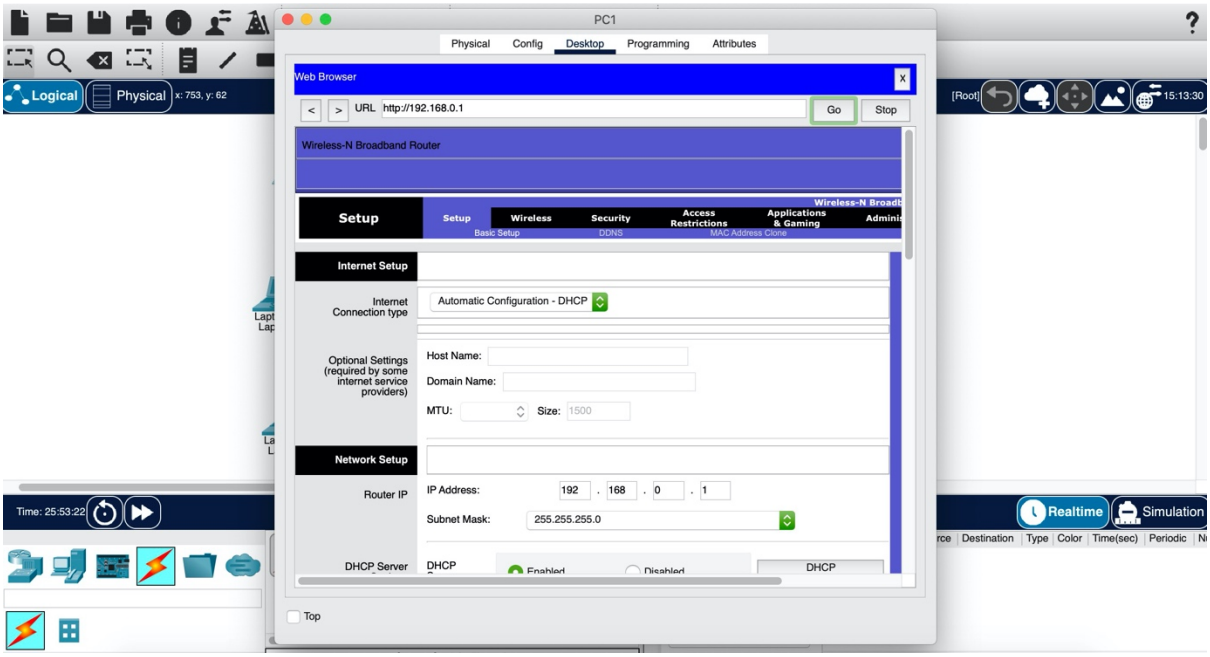
You can now see that Laptop1 is connected:



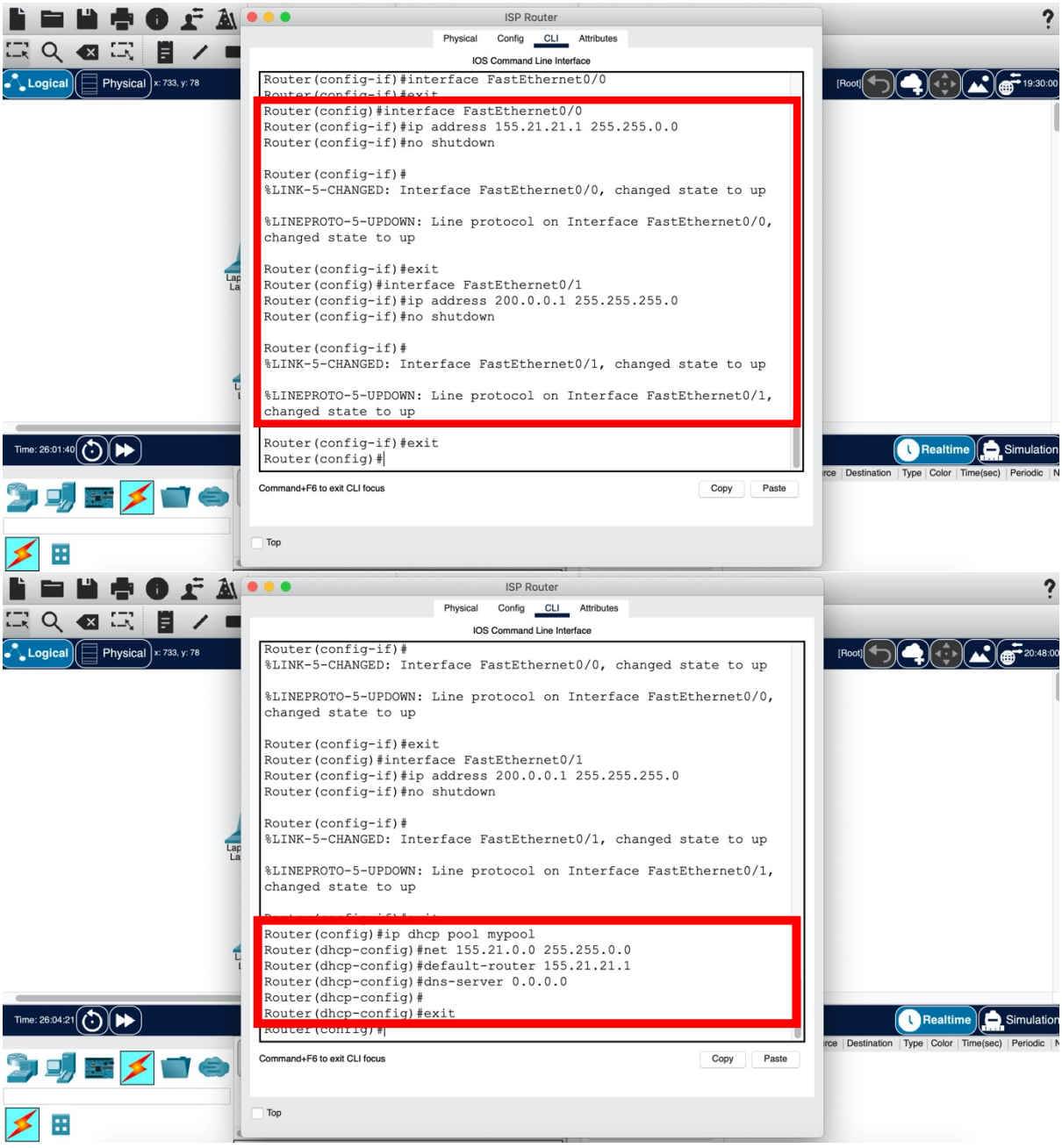
Repeat this process for the Laptop2.

6 Internet Setup

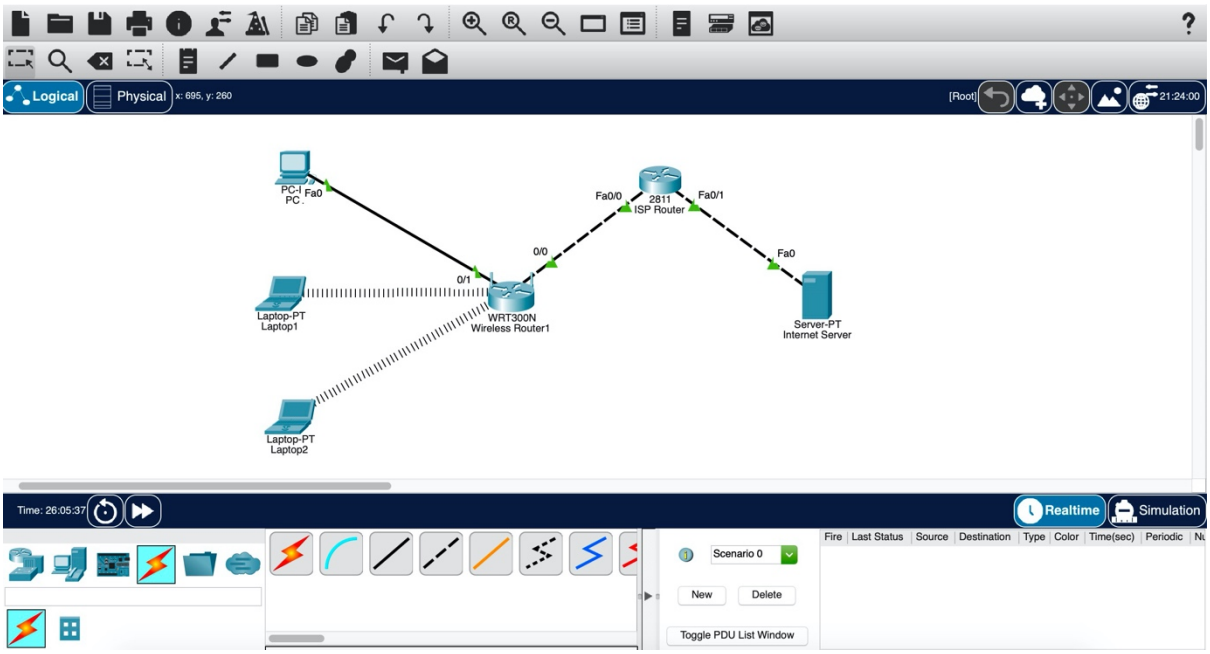
For this part, we'll configure the internet interface on the router to connect our LAN to the internet. Here, we'll connect the internet interface to the ISP router which then connects to the internet server. To do this, access the 'Internet Setup' tab on the GUI of the wireless router. Remember the username and the new password you set.



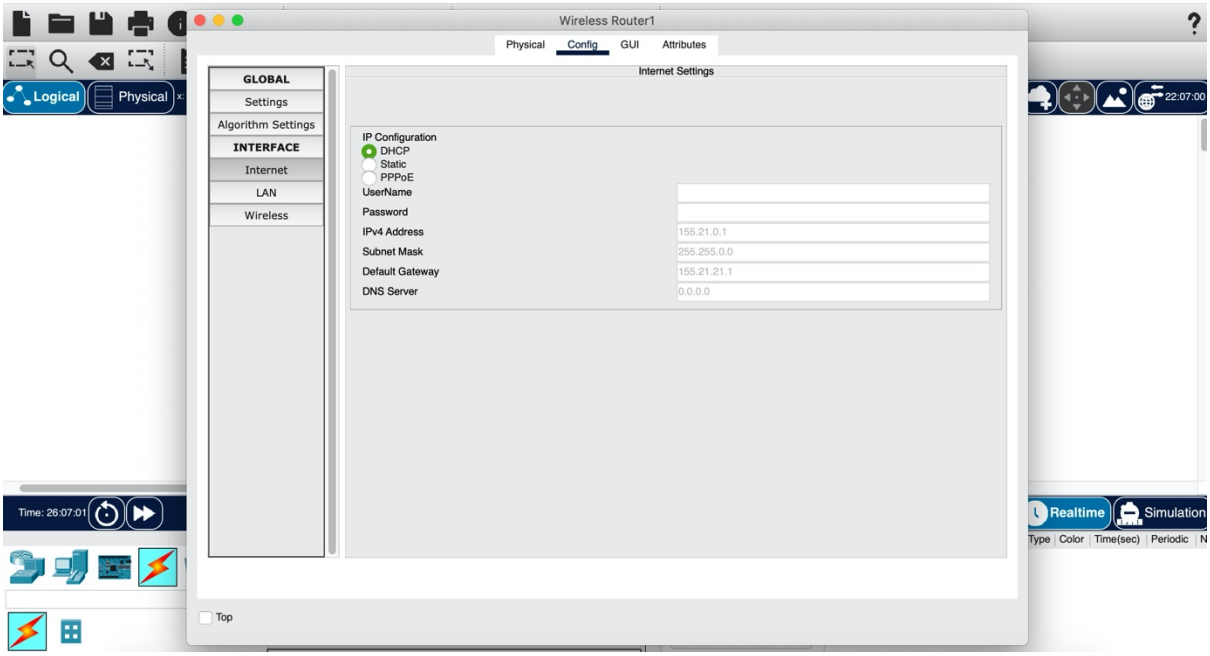
To set internet connectivity in this case, we will setup the internet interface to act as a DHCP client (with the DHCP server configured on the ISP router). To do this, configure IP addresses and a DHCP server on the ISP router as shown below:



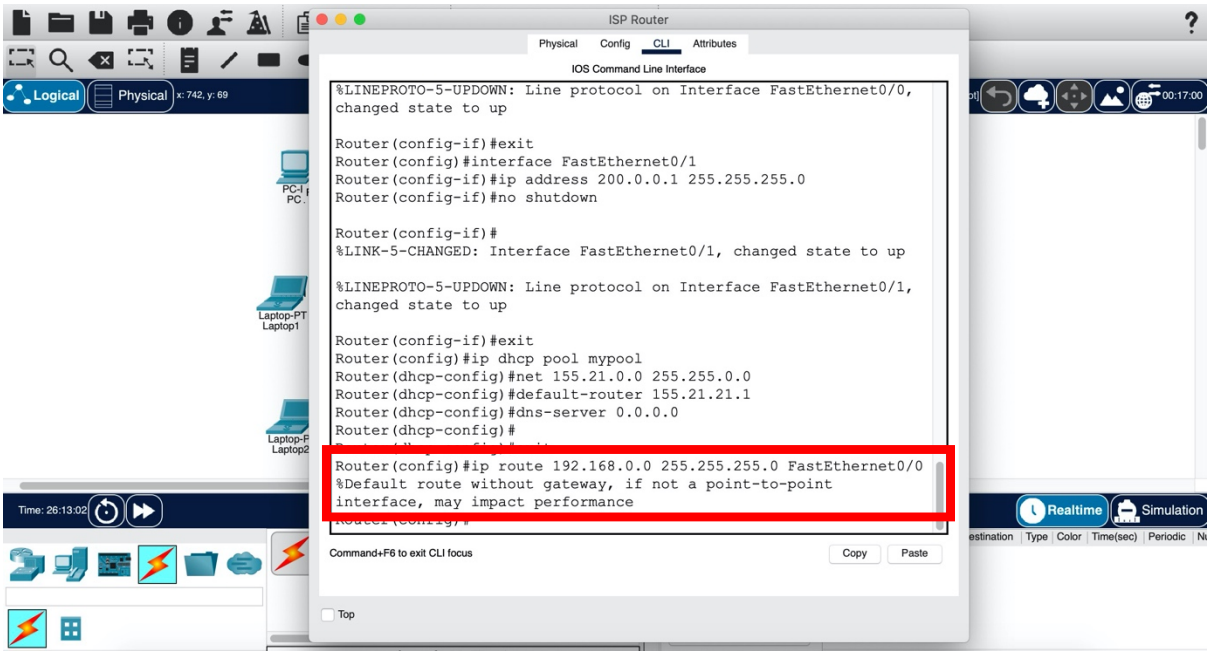
Connections should now all be green:



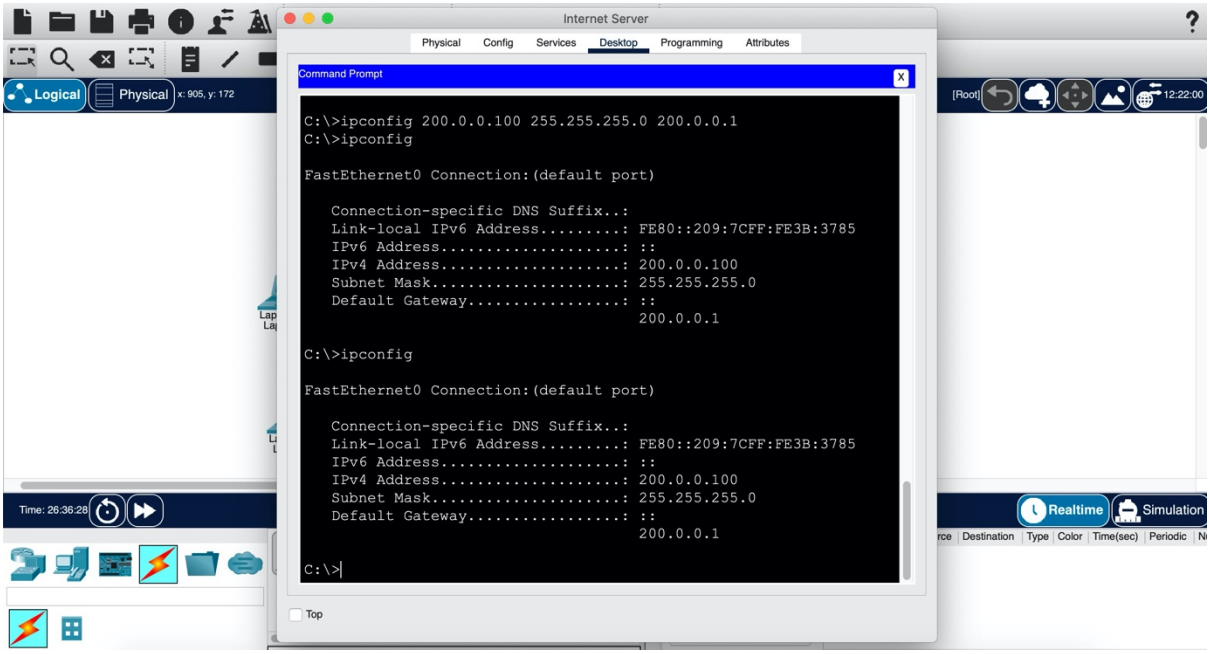
Now make the internet interface a DHCP client by enabling DHCP on it. To verify the DHCP configuration, click on the wireless router, go to 'Config', and pick DHCP. The interface is now configured with an IP address from the pool set in the ISP router, as shown below:



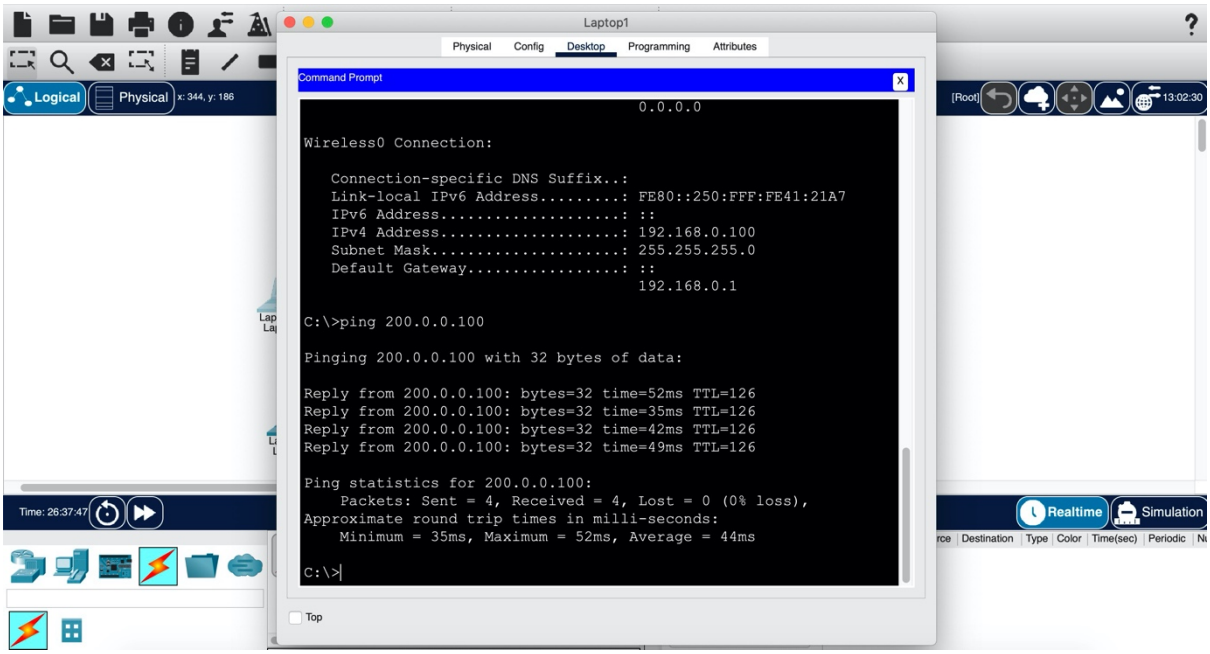
Next, you need to configure static or dynamic routes in the ISP router for the devices in the wireless LAN to gain access to the internet server. Hence, we will do the following:



Lastly, if you have not already done so, assign an IP address to the internet server (in this case 200.0.0.100).

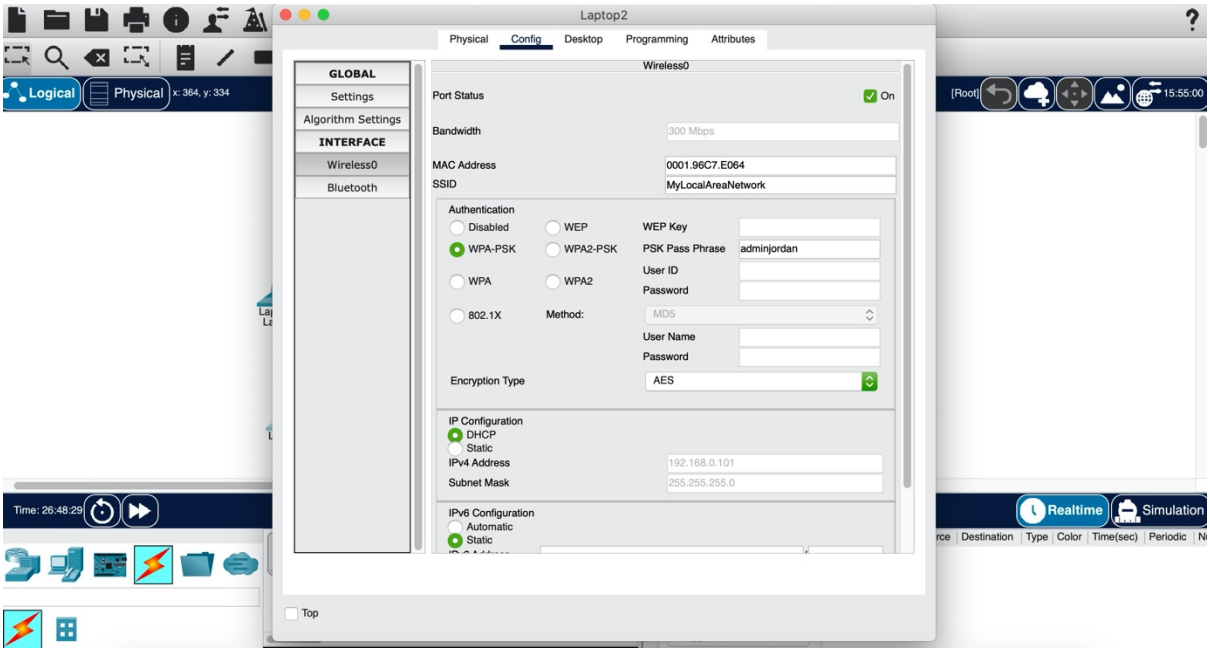


Now try and reach the internet server from a host in the LAN. For example, try and ping the internet server from Laptop1. The ping should succeed as shown below:

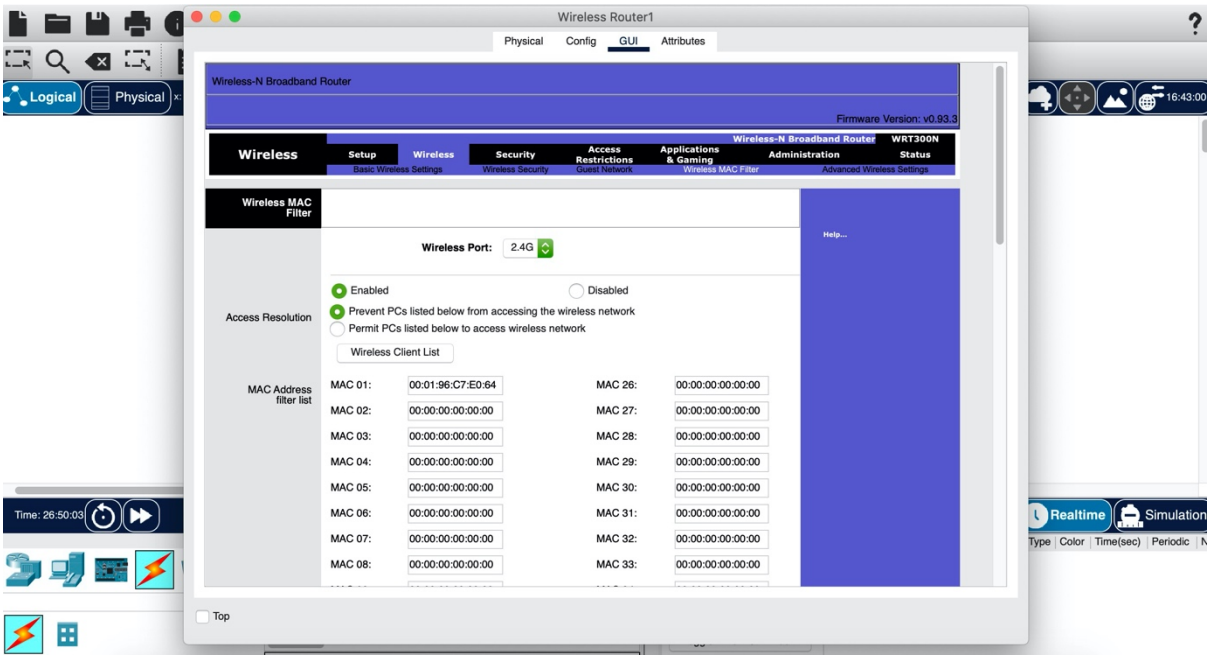


7 MAC Address Filtering

Now we are going to identify the mac address from laptop 2 and prevent it from accessing the network. First find its MAC address (in this case it is 0001.96C7.E064)



Go to the wireless router GUI, click on wireless, and then wireless MAC Filter. Click enable and add in the MAC address for laptop 2. Then remember to scroll down and click ‘Save settings’.



Laptop 2 will now not be connected to the network: