VxLEARN Networks

Networking & Cybersecurity Track
Simulated Employment Program

Lab Report:
Configure a Wireless Router and Client

Prepared by:
Kudzaishe Majeza
Junior Network Engineer – VxLEARN Networks

Mentor:
Titus Majeza
Senior Network Engineer

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1. Objective

The purpose of this lab is to configure a wireless router and connect multiple clients to it through both wired and wireless connections. This exercise demonstrates how DHCP, wireless security, and IP addressing function in a small office or home environment. The goal is to ensure that devices such as the Office PC, Bedroom PC, and Laptop can access the internet via the configured home router.

2. Background

Natsumi has recently moved into a new home and requires a wireless network to connect her devices to the internet. As a network specialist, you were asked to assist her in setting up a home wireless router, configuring DHCP, enabling wireless security, and ensuring that all devices can access the web successfully. This configuration was performed in Cisco Packet Tracer, simulating real-world router setup procedures.

3. Part 1 – Connect the Devices

In the first stage, the Office PC, Bedroom PC, and Laptop were connected to the Home Wireless Router. The Office PC was connected using an Ethernet cable, while the Laptop was connected wirelessly. This formed the base topology of Natsumi's home network.

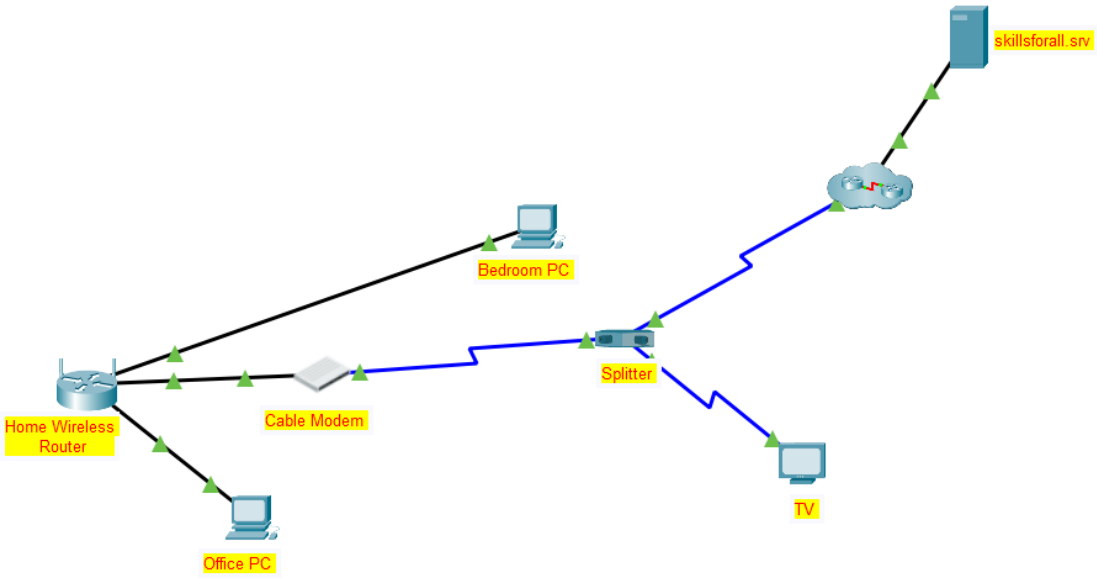


Figure 1 – Network Topology Setup

4. Part 2 – Configure the Wireless Router

4.1 Accessing the Router GUI

Using the **Office PC**, the router's interface was accessed through a web browser.
The PC was first configured to use DHCP, ensuring it received an IP address on the same network as the router.
Once an address beginning with `192.` was assigned, the **default gateway address** was noted as the router's IP.
That IP was entered into the browser to open the **router's GUI** using the default credentials `admin/admin`.

This allowed full configuration access to Natsumi's network settings.

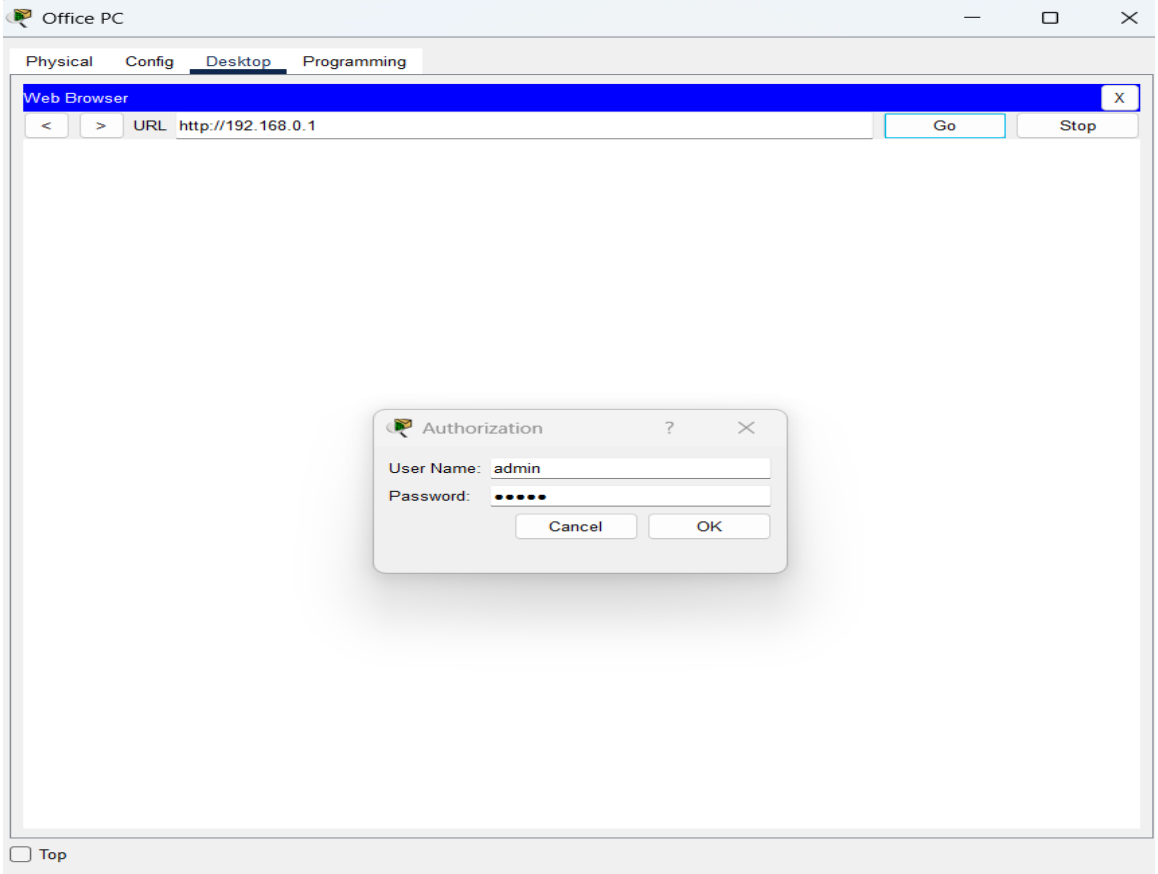


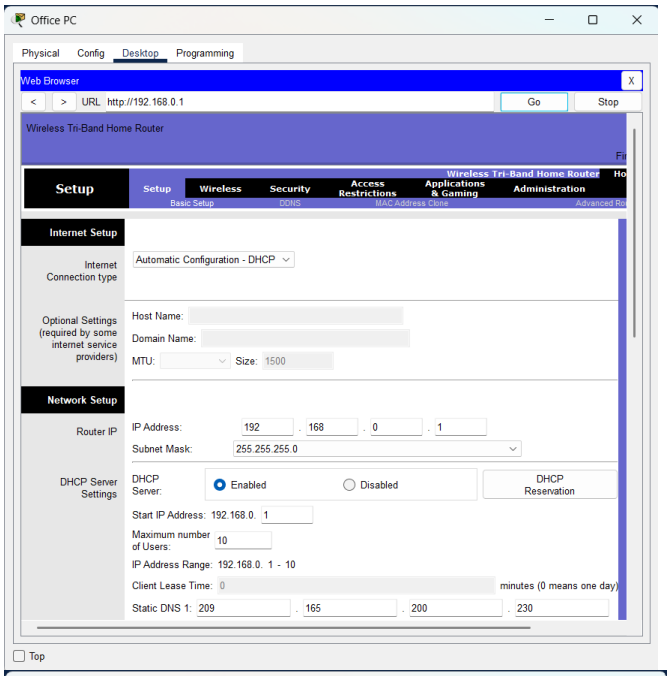
Figure 2: Router GUI Access

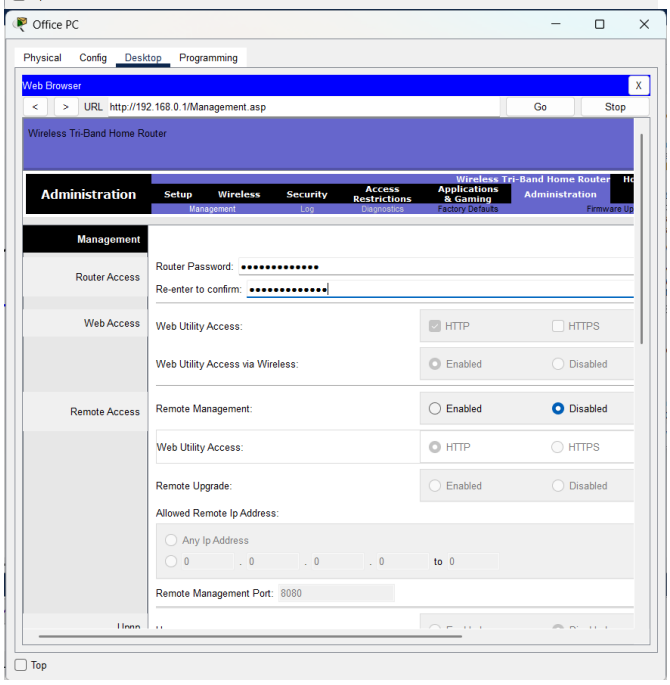
4.2 Basic Settings Configuration

Inside the **Setup tab**, DHCP parameters were adjusted to limit the number of connected devices. Because Natsumi only expects a few users, the maximum number of DHCP users was set to 10. This helps conserve IP resources and improve overall security.

In the **Administration tab**, the router password was changed from the default admin to **MyPassword1!**, then saved.

After saving, the router required re-authentication using the new credentials.





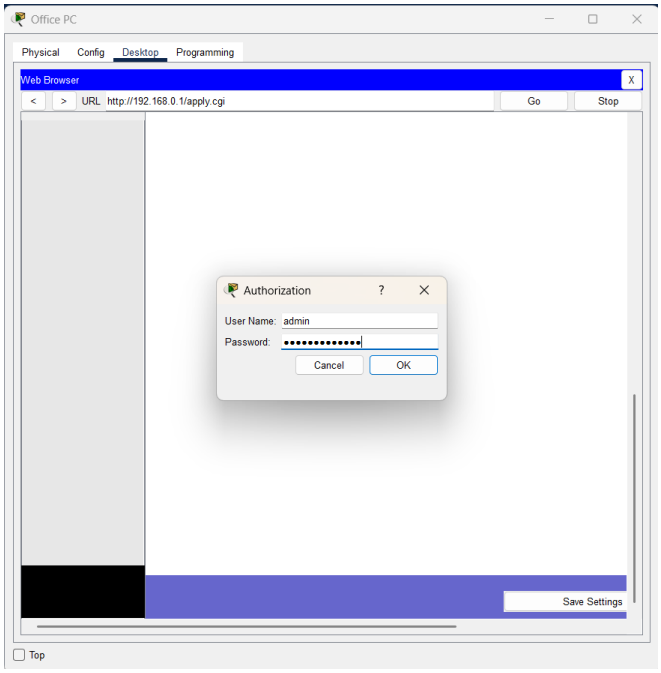


Figure 3: DHCP and Password Configuration

4.3 Wireless LAN Configuration

The router's wireless functionality was enabled and the **SSID** was changed from Default to **MyHome.**

This name identifies the Wi-Fi network for Natsumi's household.

For security, the **2.4 GHz** network was configured to use **WPA2 Personal** encryption with the passphrase **MyPassPhrase1!**.

This ensured only authorized users could join the wireless network.

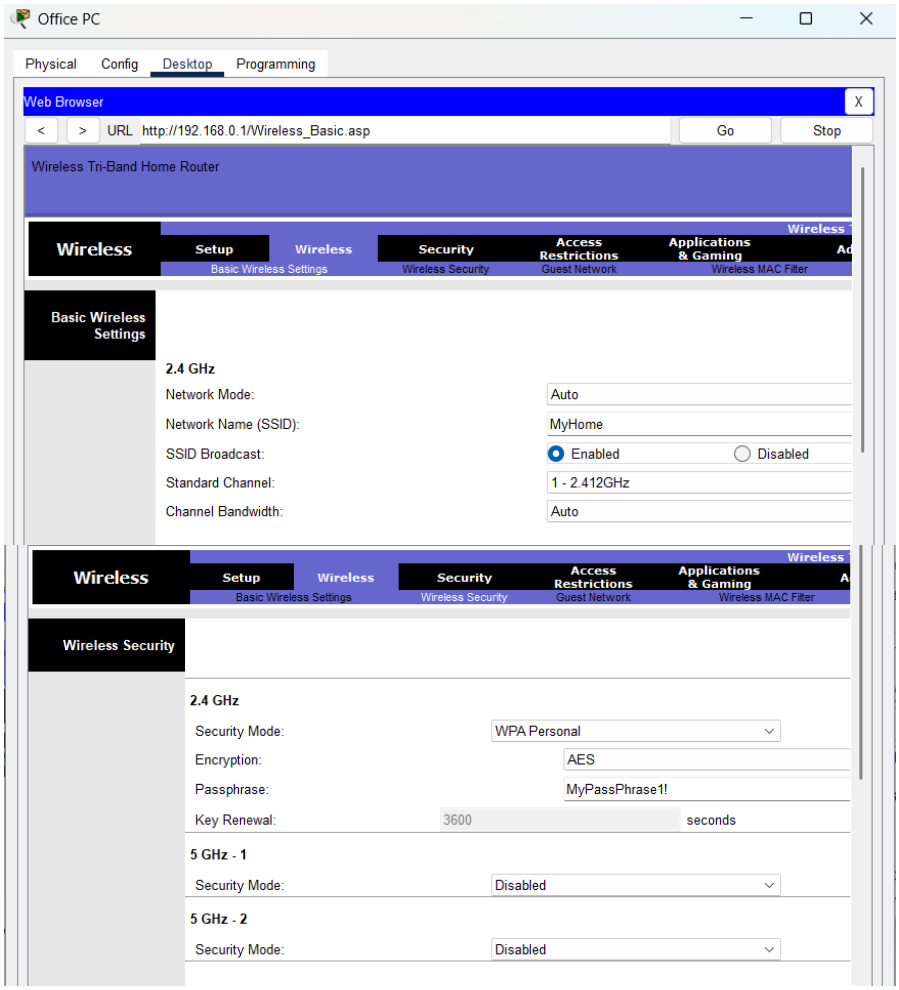


Figure 4: Wireless SSID and Security Setup

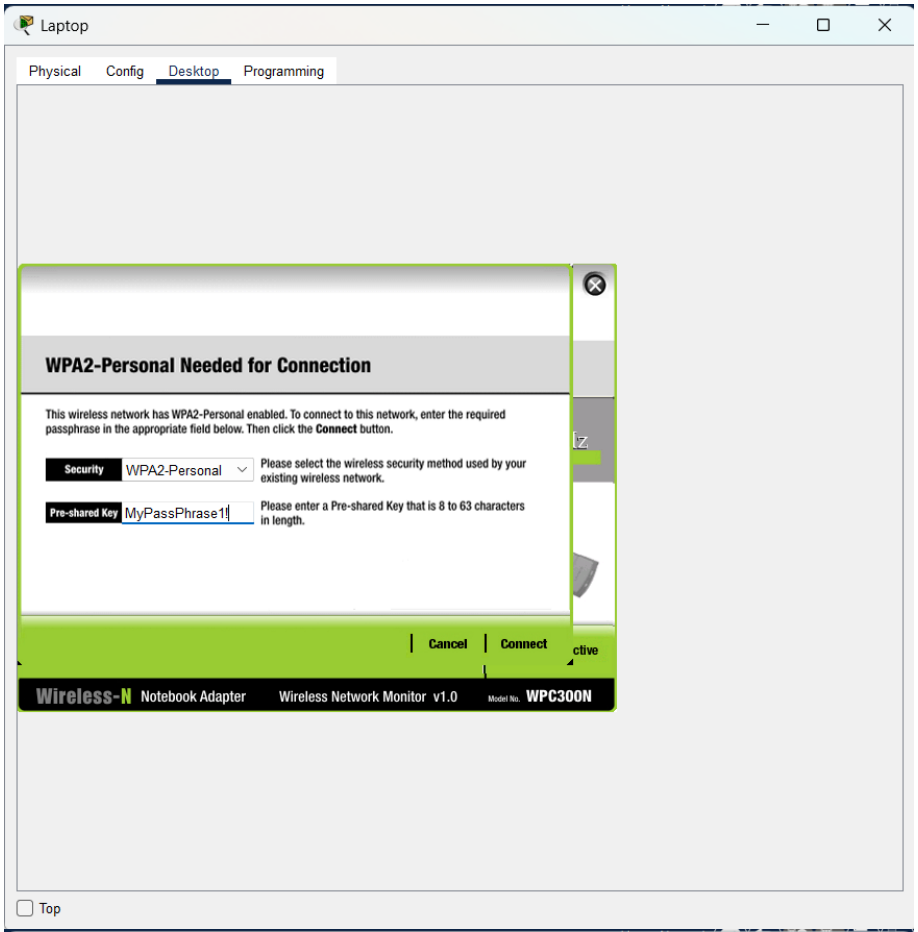
5. Part 3 – Configure IP Addressing and Test Connectivity

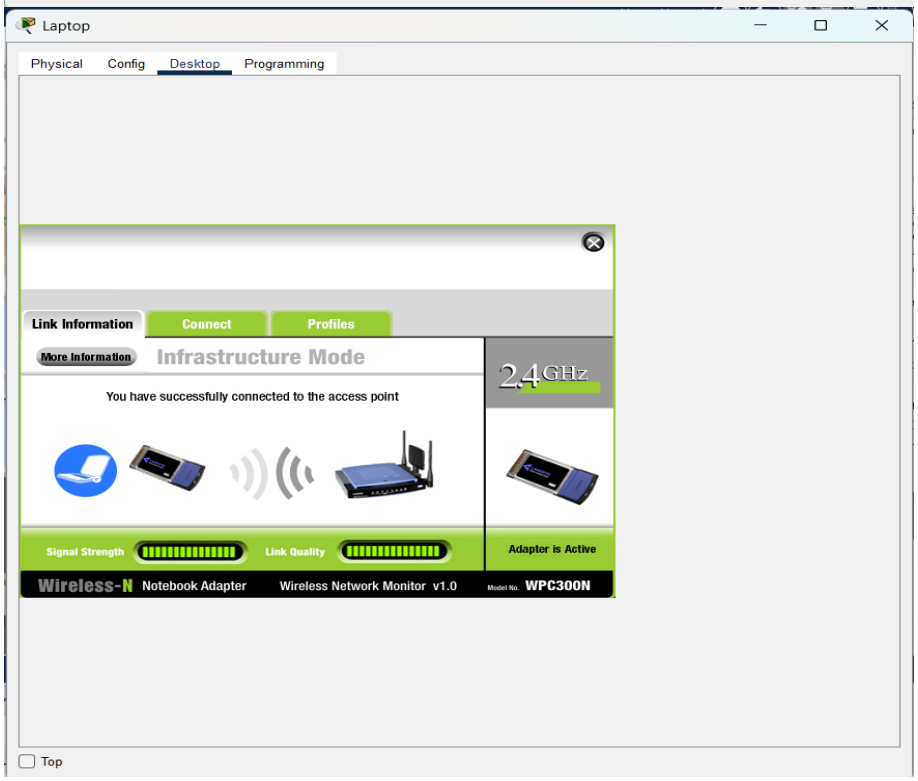
5.1 Laptop Connection to Wireless Network

The Laptop was connected to the “MyHome” network using the PC Wireless utility.

After selecting the SSID and entering the passphrase **MyPassPhrase1!**, the laptop obtained an IP address automatically from DHCP.

The IP began with `192.168.0.x` , confirming successful connection to the home router.


Laptop
Physical
Config
Desktop
Programming
WPA2-Personal Needed for Connection
This wireless network has WPA2-Personal enabled. To connect to this network, enter the required passphrase in the appropriate field below. Then click the Connect button.
Security
WPA2-Personal
Please select the wireless security method used by your existing wireless network.
Pre-shared Key
MyPassPhrase1!
Please enter a Pre-shared Key that is 8 to 63 characters in length.
Cancel
Connect
Wireless-N Notebook Adapter
Wireless Network Monitor v1.0
Model No. WPC300N
Top


Laptop
Physical
Config
Desktop
Programming
Link Information
Connect
Profiles
More Information
Infrastructure Mode
2.4GHz
You have successfully connected to the access point
Signal Strength
Link Quality
Adapter is Active
Wireless-N Notebook Adapter
Wireless Network Monitor v1.0
Model No. WPC300N
Top

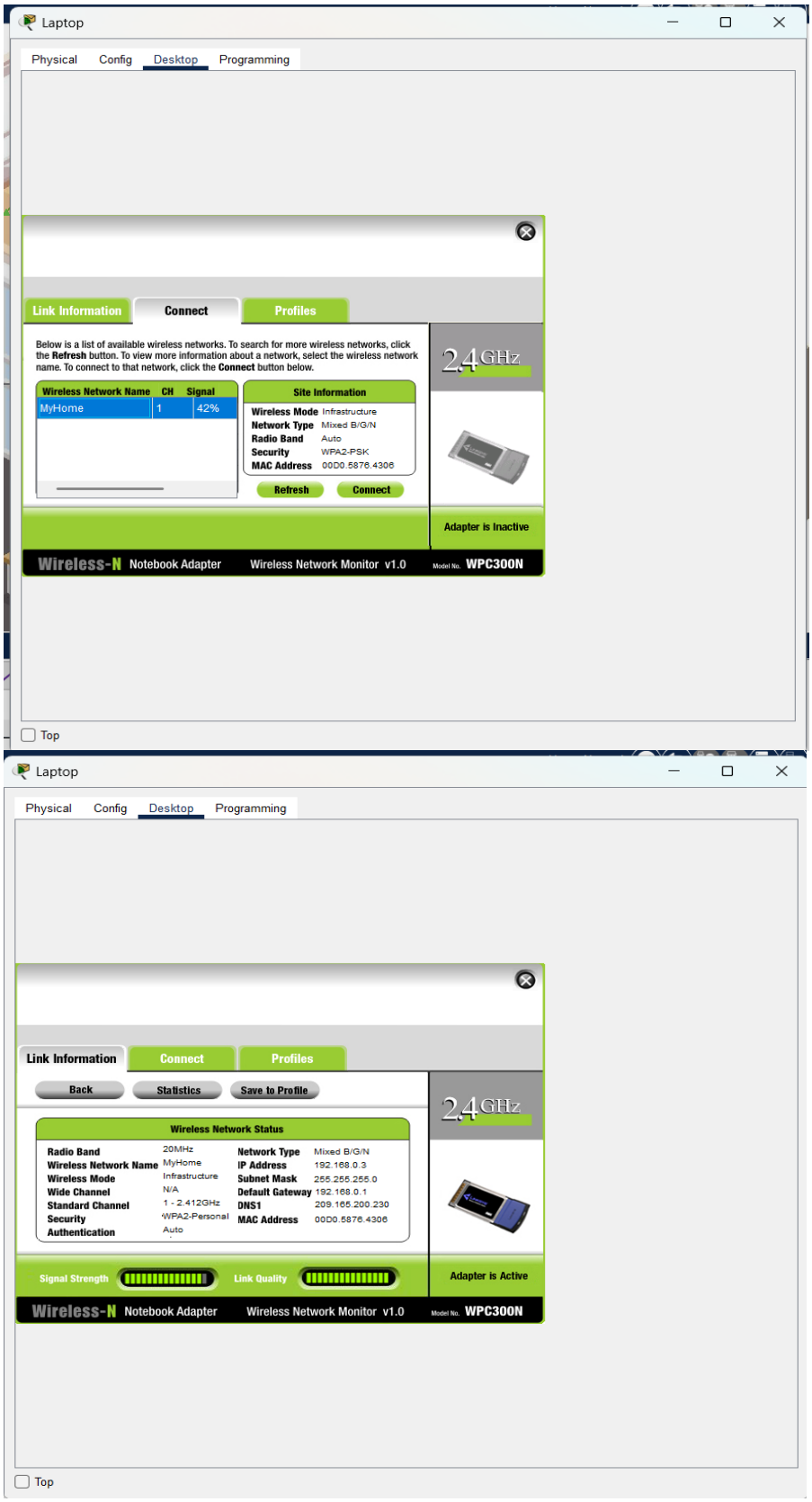


Figure 5: Laptop Connected to Wi-Fi

5.2 Office PC Connectivity Verification

The **Office PC**, which was used for configuration, was tested for internet connectivity.

A browser test to skillsforall.srv successfully loaded the page, confirming both LAN and WAN connectivity for the wired client.

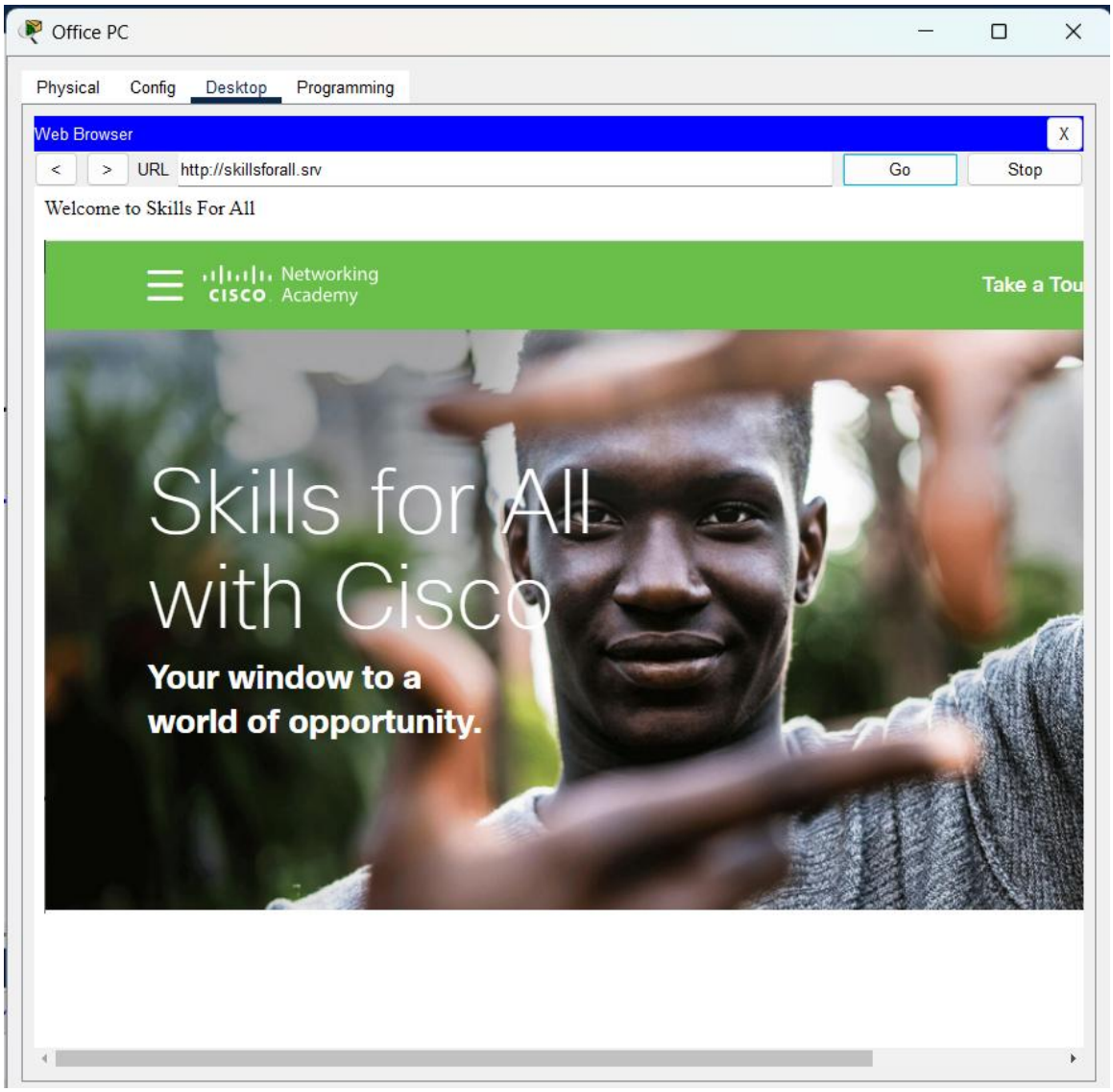


Figure 6: Office PC Web Access Test

5.3 Bedroom PC Configuration

The **Bedroom PC** was configured to use DHCP and received a valid address in the 192.168.0.x range.

A test connection to skillsforall.srv confirmed full network access and router functionality.

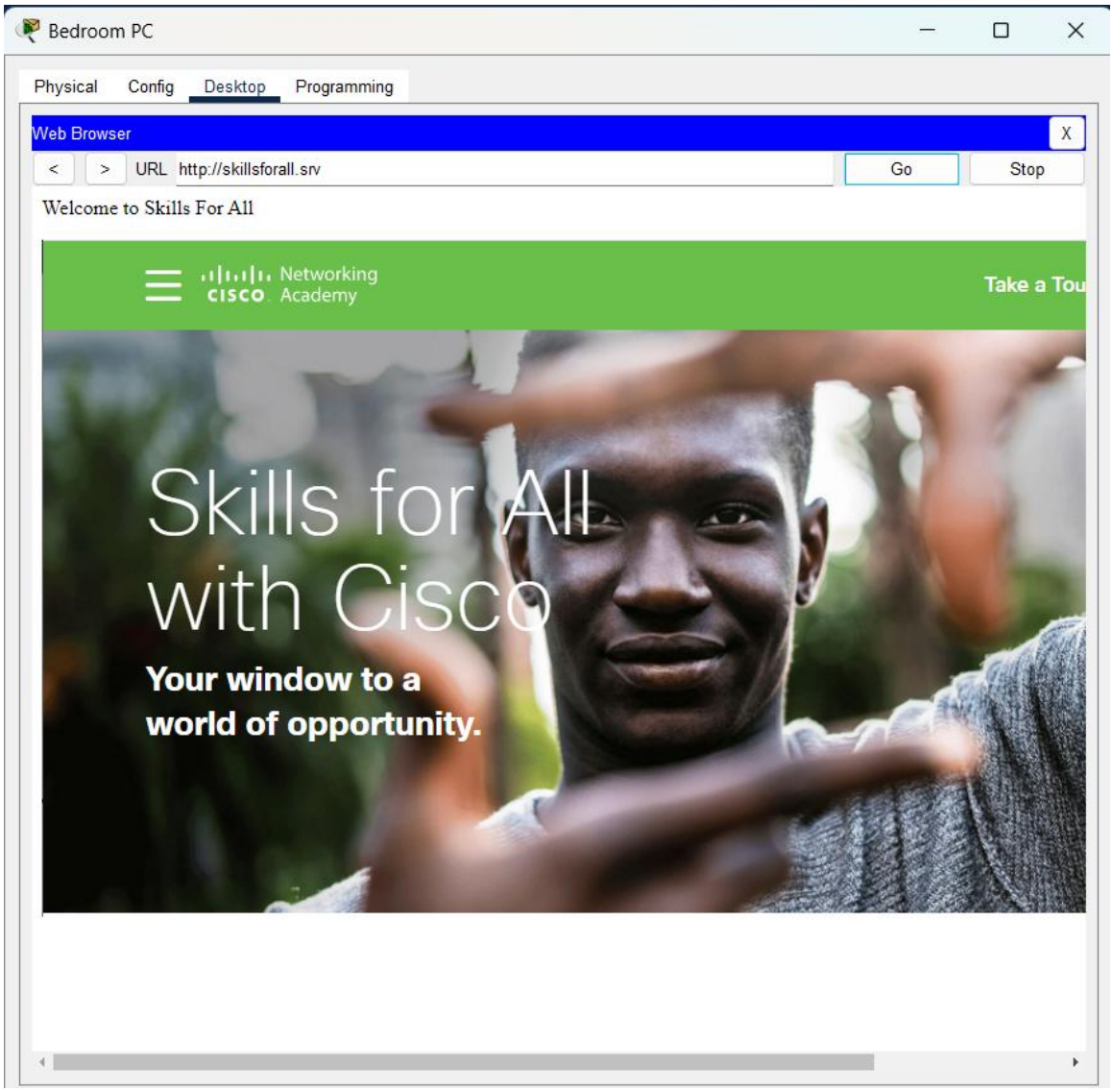


Figure 7: Bedroom PC Connectivity Test

6. Results and Observations

All three devices were able to obtain IP addresses and access the internet successfully.

- The **Office PC** and **Bedroom PC** verified wired connections.
- The **Laptop** demonstrated secure wireless connectivity.

Ping and browsing tests confirmed proper DHCP configuration, network routing, and internet connectivity.

7. Reflection and Conclusion

This lab demonstrated the configuration of a SOHO (Small Office/Home Office) wireless router using Cisco Packet Tracer.

I learned how DHCP dynamically assigns IP addresses, how to apply WPA2 security, and how to verify device connectivity across wired and wireless networks.

It reinforced my understanding of:

- DHCP operation and gateway configuration
- Wireless security best practices
- IP addressing and connectivity testing
- The importance of changing default credentials and limiting DHCP users

In conclusion, the lab successfully demonstrated end-to-end wireless configuration using Cisco Packet Tracer. The practical implementation validated theoretical knowledge on DHCP, IP addressing, and wireless security. This lab lays the foundation for more advanced studies in network automation, VLANs, and security policies.

Sign-Off

Prepared by:
Kudzaishe Majeza
Junior Network Engineer – VxLEARN Networks

Reviewed by:
Titus Majeza
Senior Network Engineer