Week 4 Assignment 2

Course: Cloud and Network Security - C1-2026

Student Name: Bussllus Bertrand

Student Number: CS-CNS11-26004

Friday, February 13, 2026

Week four Assignment two:

Class exercise: Packet Tracer WLAN configuration

Contents

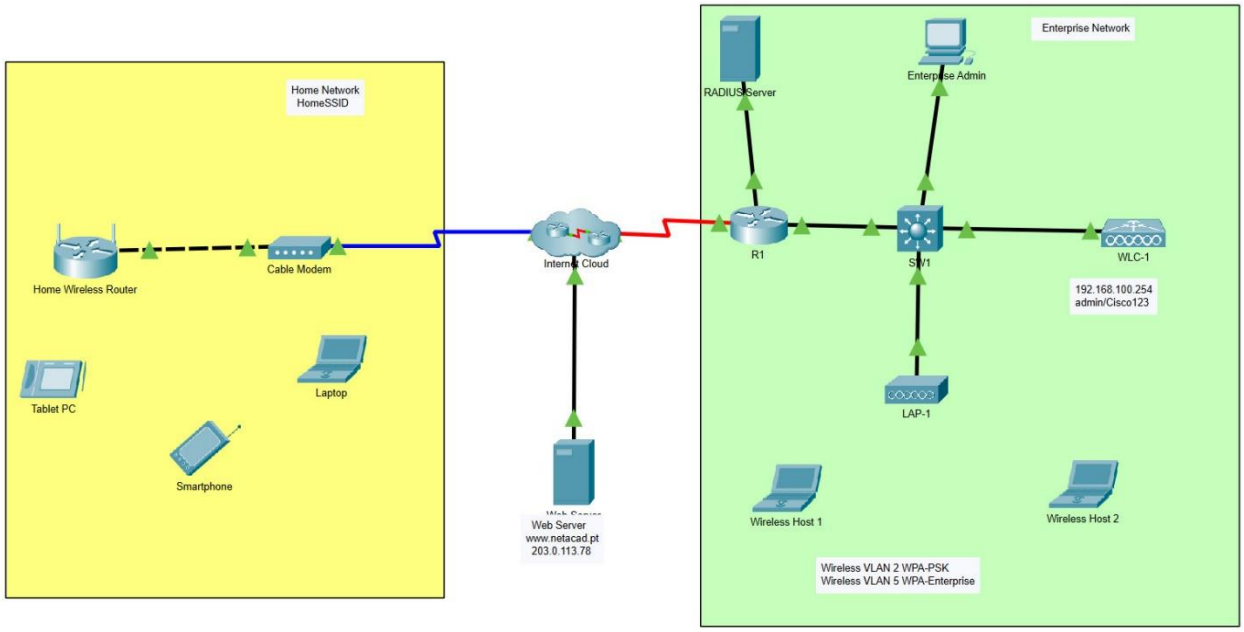
Week 4 Assignment 2

Introduction

In this Packet Tracer activity, you will bridge the gap between consumer-grade and enterprise-grade wireless networking. The exercise provides a comprehensive scenario where you are tasked with configuring two distinct wireless environments: a residential network for a friend and a more complex, controller-based network for an enterprise.

The primary objective is to implement robust security standards across different hardware platforms. You will begin by configuring a Home Wireless Router to provide Wi-Fi connectivity, adjusting DHCP settings, and securing the network using WPA2-PSK (Personal) authentication. Following this, you will transition to an enterprise environment to configure a Wireless LAN Controller (WLC). This advanced segment requires you to create multiple WLANs mapped to VLAN interfaces, configure a DHCP scope for management, and integrate external services by pointing the WLC to RADIUS and SNMP servers. By the end of this exercise, you will have implemented both WPA2-PSK and WPA2-Enterprise security standards and verified connectivity across diverse wireless clients

Topology



Addressing Table

Device	Interface	IP Address
Home Wireless Router	Internet	DHCP
	LAN	192.168.6.1/27
RTR-1	G0/0/0.2	192.168.2.1/24
	G0/0/0.5	192.168.5.1/24
	G0/0/0.100	192.168.100.1/24
	G0/0/1	10.6.0.1/24
SW1	VLAN 200	192.168.100.100/24
LAP-1	G0	DHCP
WLC-1	Management	192.168.100.254/24
RADIUS Server	NIC	10.6.0.254/24
Home Admin	NIC	DHCP
Enterprise Admin	NIC	192.168.100.200/24
Web Server	NIC	203.0.113.78/24
DNS Server	NIC	10.100.100.252
Laptop	NIC	DHCP
Tablet PC	Wireless0	DHCP

Week 4 Assignment 2

Device	Interface	IP Address
Smartphone	Wireless0	DHCP
Wireless Host 1	Wireless0	DHCP
Wireless Host 2	Wireless0	DHCP

WLAN Information

WLAN	SSID	Authentication	Username	Password
Home Network	HomeSSID	WPA2-Personal	N/A	Cisco123
WLAN VLAN 2	SSID-2	WPA-2 Personal	N/A	Cisco123
WLAN VLAN 5	SSID-5	WPA-2 Enterprise	userWLAN5	userW5pass

Objectives

In this activity, you will configure both a wireless home router and a WLC-based network. You will implement both WPA2-PSK and WPA2-Enterprise security.

- Configure a home router to provide Wi-Fi connectivity to a variety of devices.
- Configure WPA2-PSK security on a home router.
- Configure interfaces on a WLC.
- Configure WLANs on a WLC.
- Configure WPA2-PSK security on a WLAN and connect hosts to WLAN.
- Configure WPA2-Enteprise on a WLAN and connect hosts to the WLAN.
- Verify connectivity WLAN connectivity.

Week 4 Assignment 2

Background / Scenario

You will apply your WLAN skills and knowledge by configuring a home wireless router and an enterprise WLC. You will implement both WPA2-PSK and WPA2-Enterprise security. Finally, you will connect hosts to each WLAN and verify connectivity.

Instructions

Part 1: Configure a Home Wireless Router.

You are installing a new home wireless router at a friend's house. You will need to change settings on the router to enhance security and meet your friend's requirements.

Step 1: Change DHCP settings.

a. Open the **Home Wireless Router GUI** and change the **router IP** and **DHCP** settings according to the information in the **Addressing Table**.

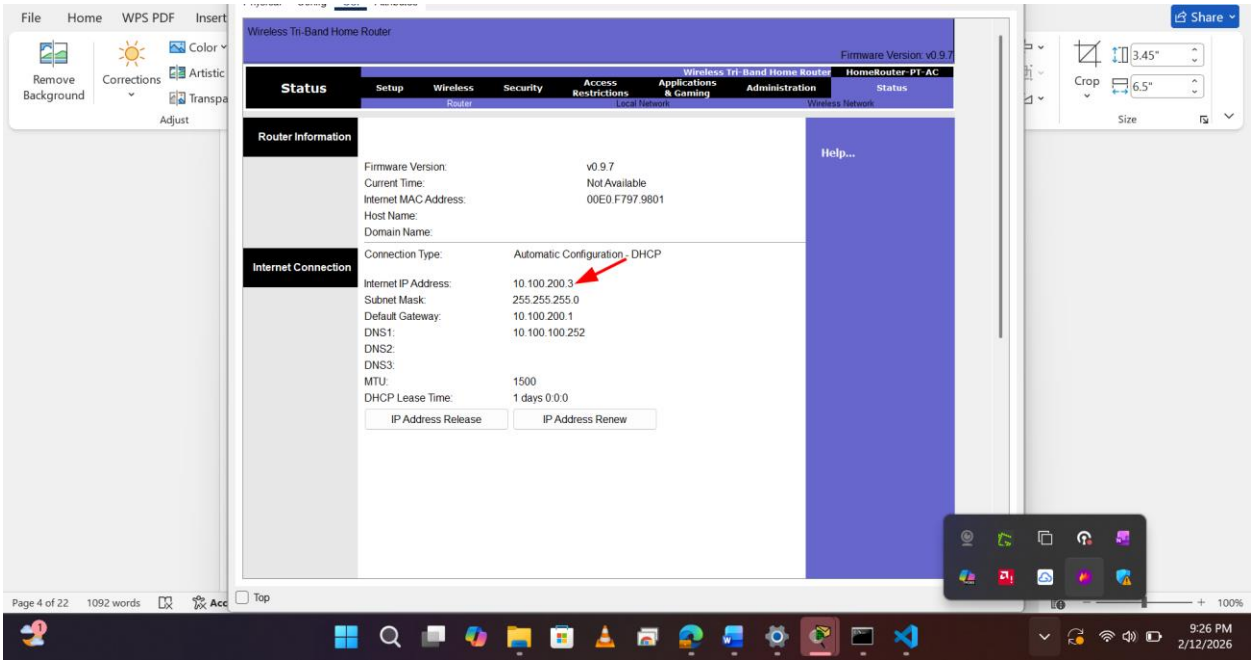
b. Permit a maximum of **20** addresses to be issued by the router.

c. Configure the DHCP server to start with IP address .3 of the LAN network.

d. Configure the internet interface of the router to receive its IP address over DHCP.

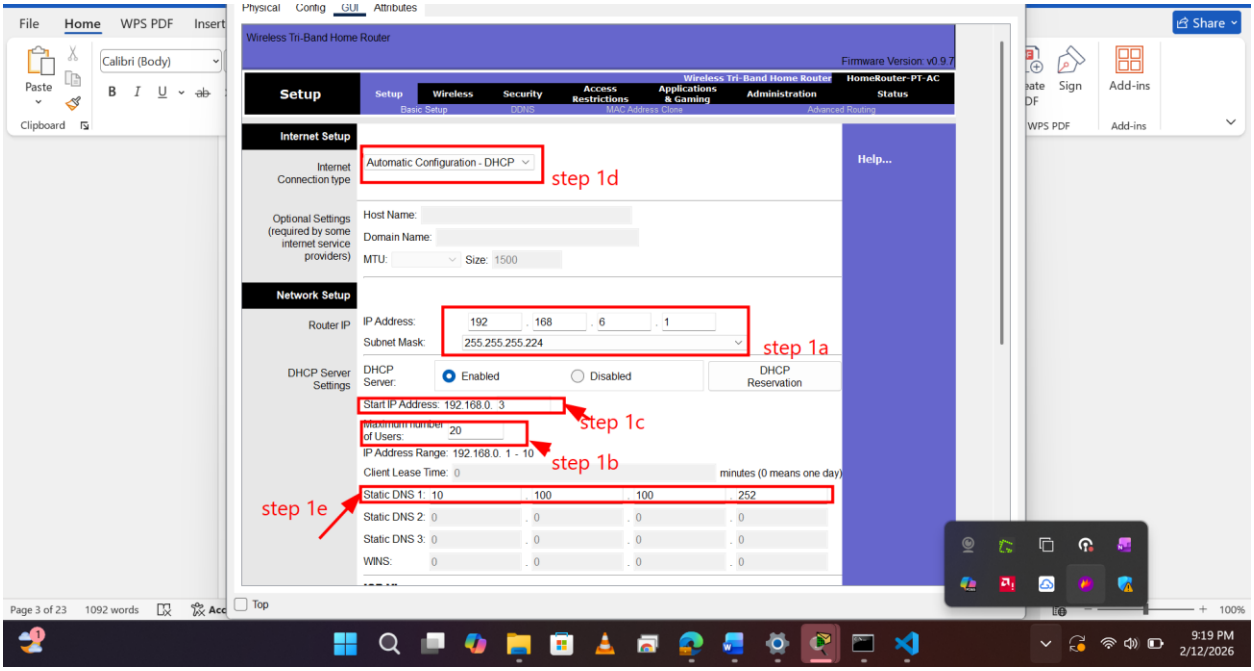
Verify the address. What address did it receive?

It is 10.100.200.3



e. Configure the static DNS server to the address in the Addressing Table.

Go to **Home Wireless Router**, **GUI** tab. Change configuration as shown below and **Save Setting**

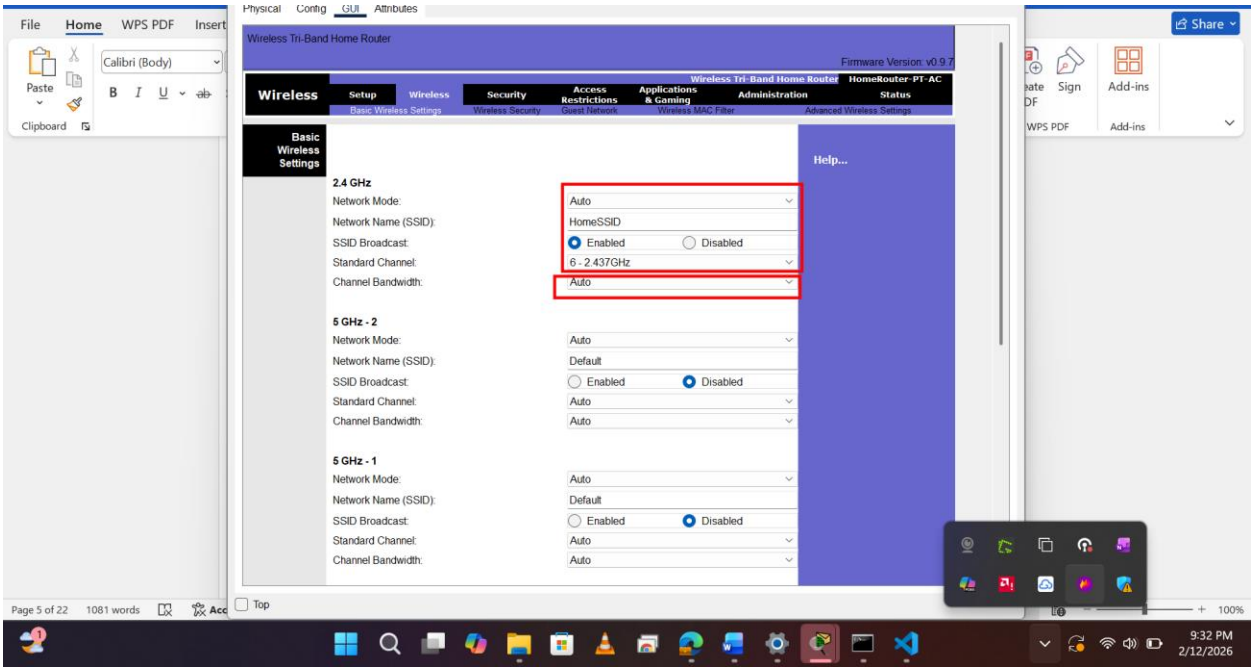


Step 2: Configure the Wireless LAN.

a. The network will use the 2.4GHz Wireless LAN interface. Configure the interface with the SSID shown in the Wireless LAN information table.

b. Use **channel 6**.

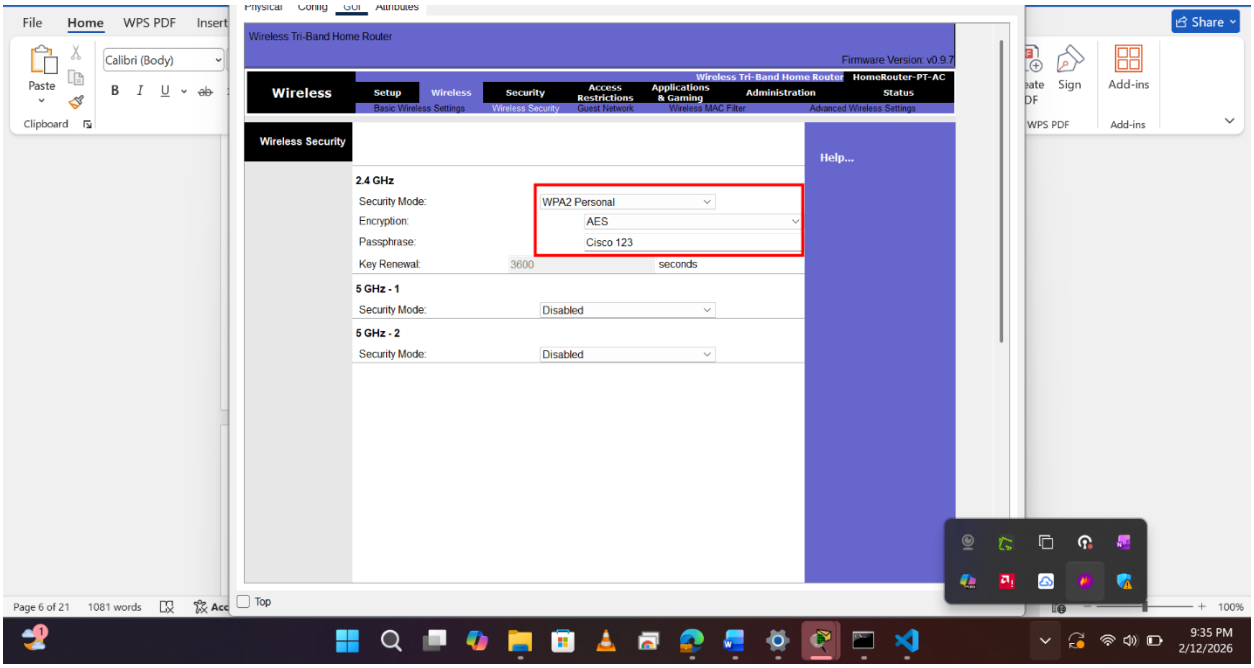
Go to tab **Wireless**. Change configuration as shown below and **Save Setting**



c. Be sure that all wireless hosts in the home will be able to see the SSID.
To see it, go to **Laptop** –> **PC Wireless** –> **Connect** tab

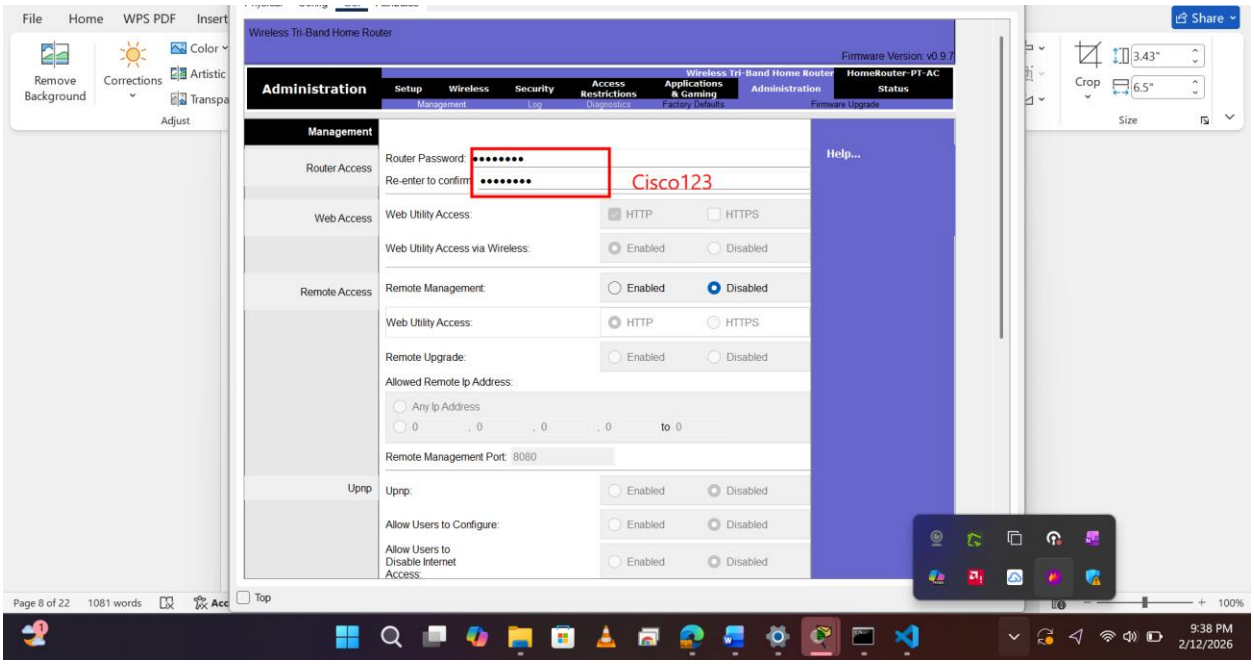
Step 3: Configure security.

a. Configure wireless LAN security. Use **WPA2 Personal** and the passphrase shown in the Wireless LAN information table.
Go to **Wireless** tab, **Wireless Security**



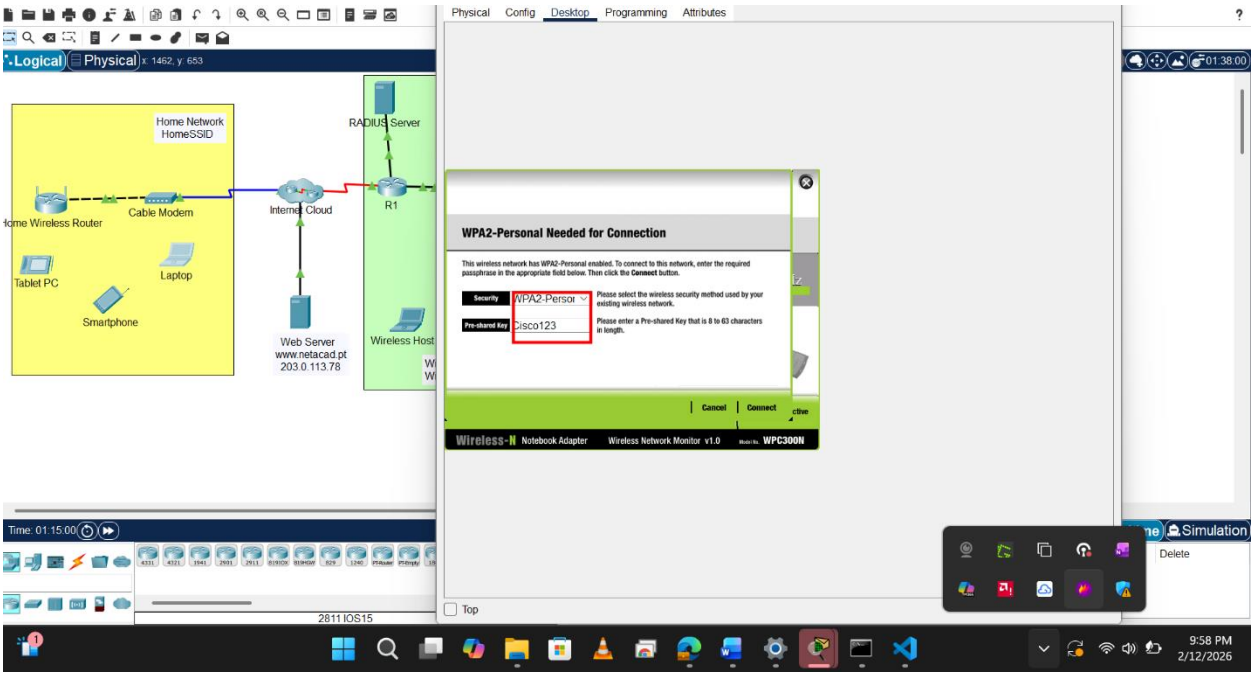
b. Secure the router by changing the default password to the value shown in the Wireless LAN information table.

Go to **Administration** tab, change Router Password to **Cisco123** and **Save Setting**

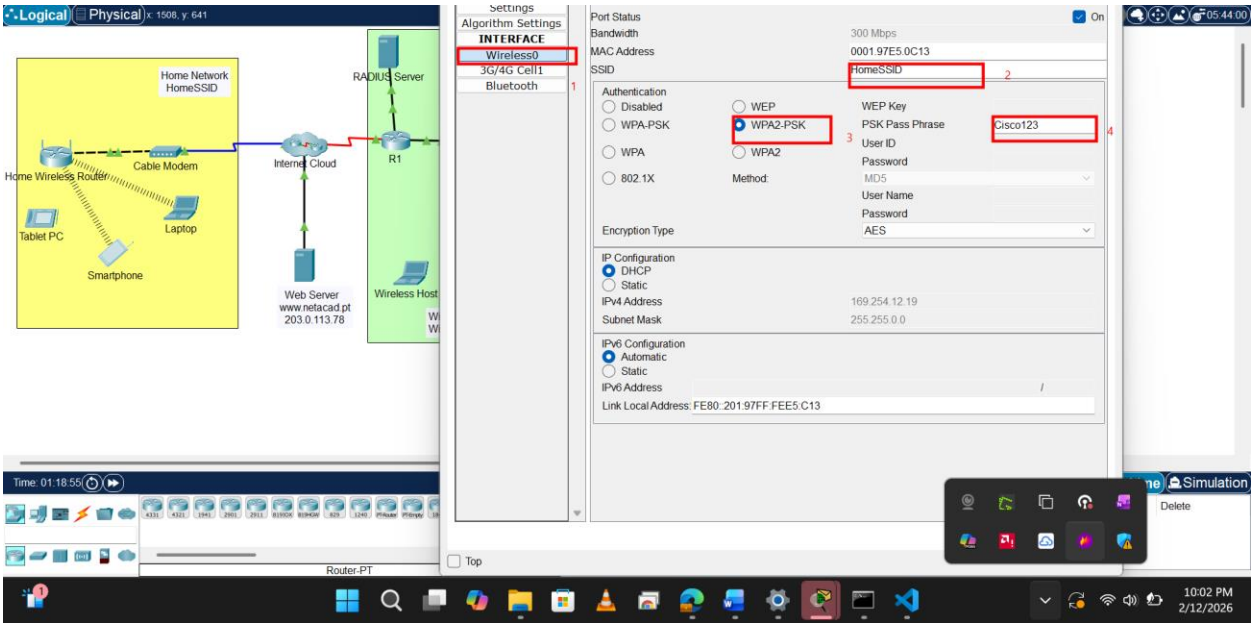


Step 4: Connect clients to the network.

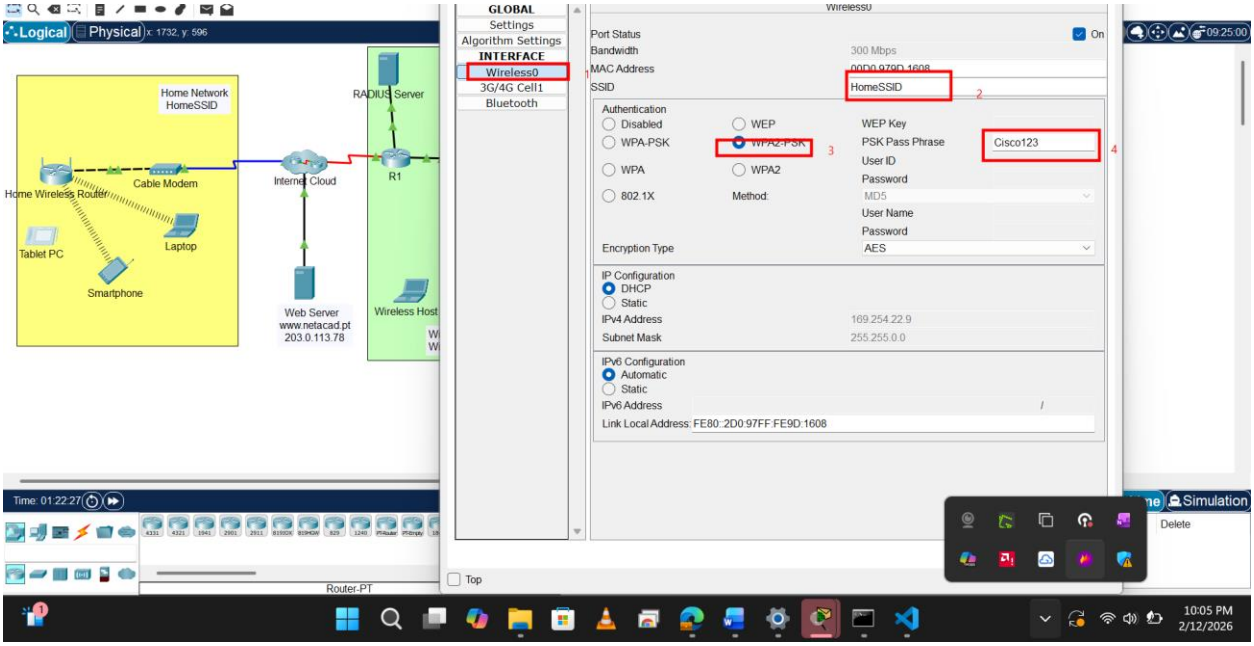
a. Open the PC Wireless app on the desktop of the laptop and configure the client to connect to the network.



b. Open the **Config** tab on the **Tablet PC** and **Smartphone** and configure the wireless interfaces to connect to the wireless network.

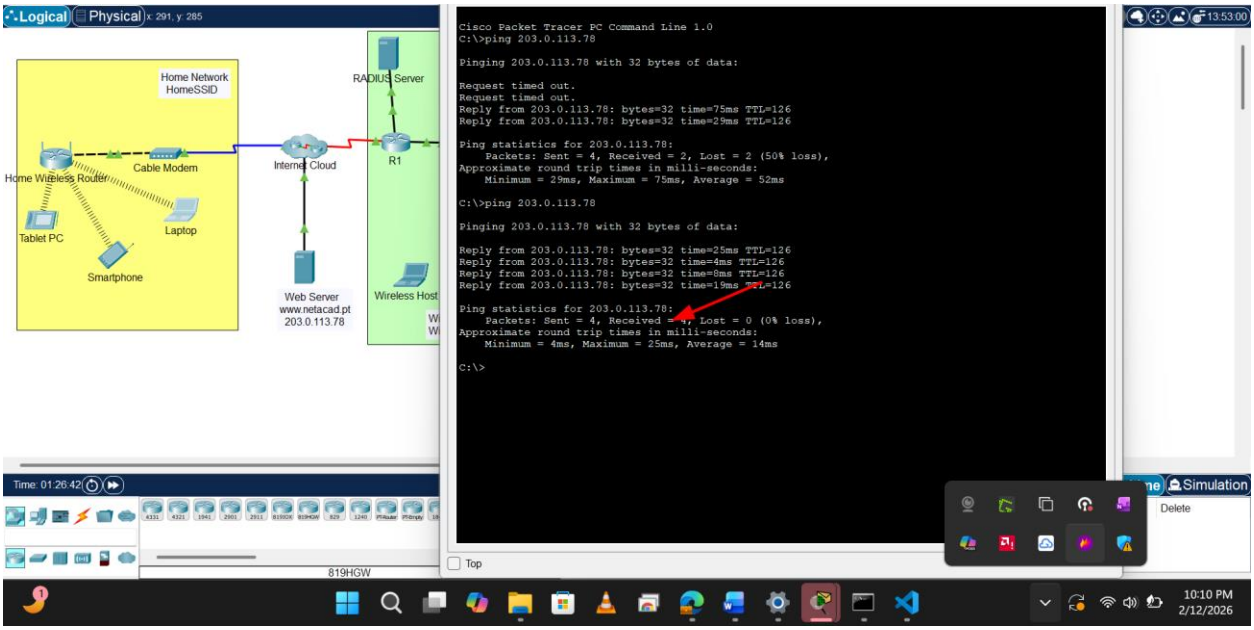


Tablet PC



c. Verify connectivity. The hosts should be able to ping each other and the web server. They should also be able to reach the web server URL.

From **Laptop, Tablet PC, Smartphone**, ping to **Web Server**



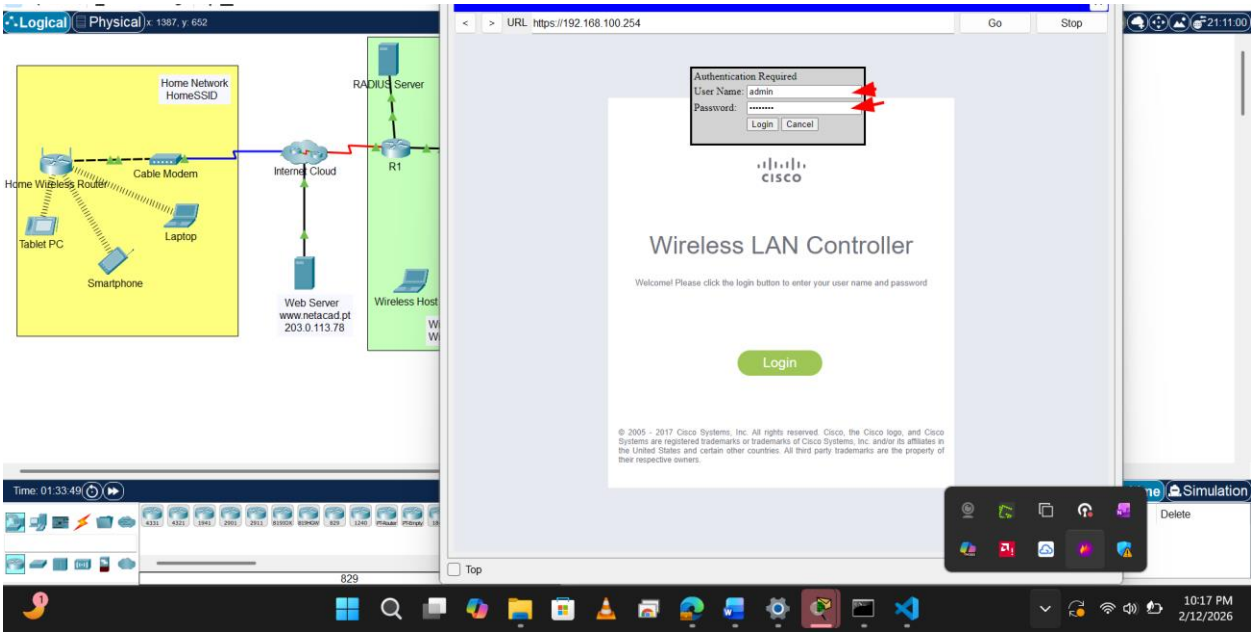
Part 2: Configure a WLC Controller Network

Configure the wireless LAN controller with two WLANs. One WLAN will use WPA2-PSK authentication. The other WLAN will use WPA2-Enterprise authentication. You will also configure the WLC to use an SNMP server and configure a DHCP scope that will be used by the wireless management network.

Step 1: Configure VLAN interfaces.

a. From the Enterprise Admin, navigate to the WLC-1 management interface via a web browser. To log into WLC-1, use **admin** as the username and **Cisco123** as the password.
Go to **Enterprise Admin** PC, **Web browser** app, Enter: **https://192.168.100.254**

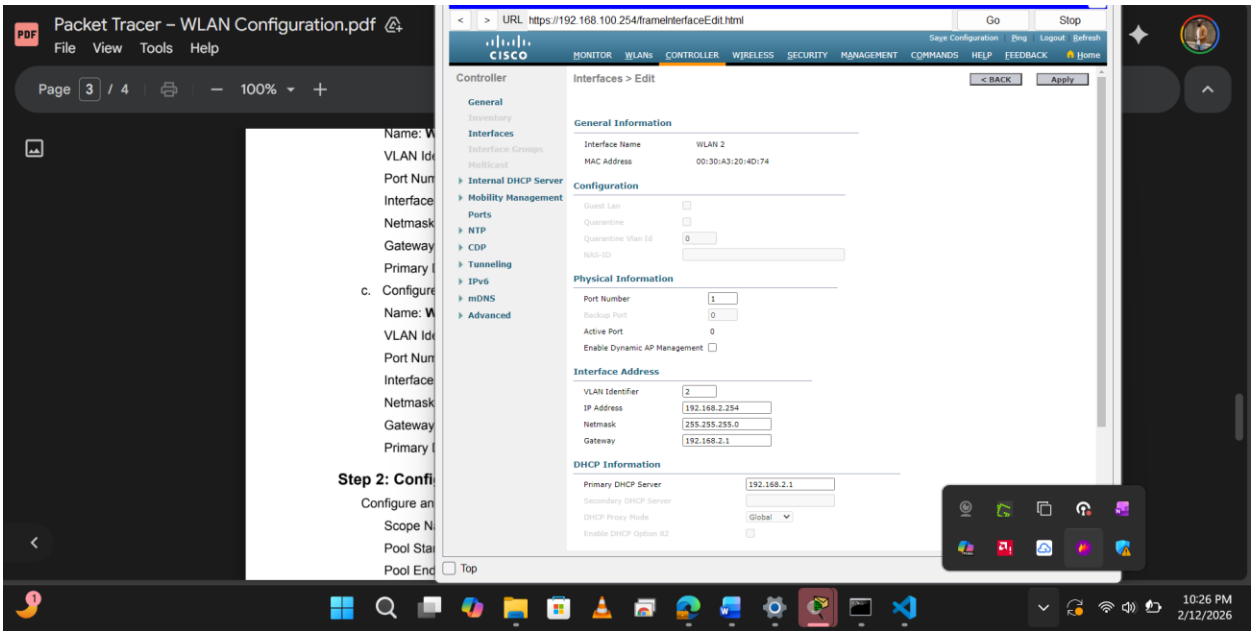
Week 4 Assignment 2



b. Configure an interface for the first WLAN.

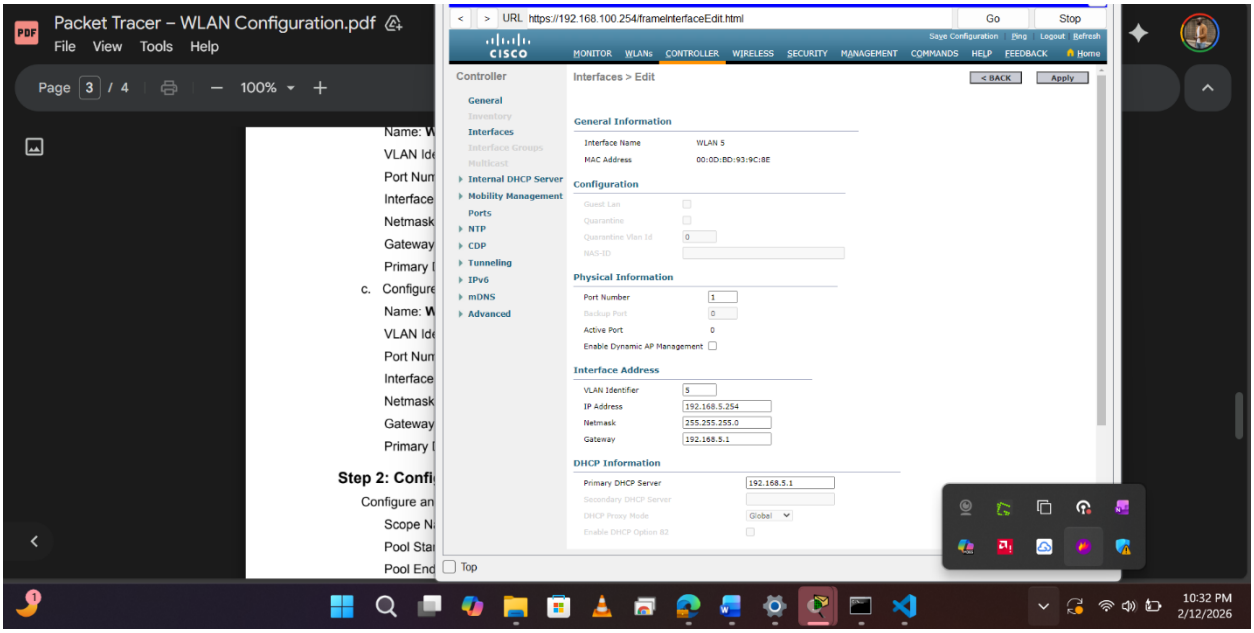
Name: **WLAN 2**
VLAN Identifier: **2**
Port Number: **1**
Interface IP Address: **192.168.2.254**
Netmask: **255.255.255.0**
Gateway: **RTR-1 G0/0/0.2 address**
Primary DHCP Server: **Gateway address**

Week 4 Assignment 2



c. Configure an interface for the second WLAN.

Name: **WLAN 5**
VLAN Identifier: **5**
Port Number: **1**
Interface IP Address: **192.168.5.254**
Netmask: **255.255.255.0**
Gateway: **RTR-1 interface G0/0/0.5 address**
Primary **DHCP Server: Gateway address**

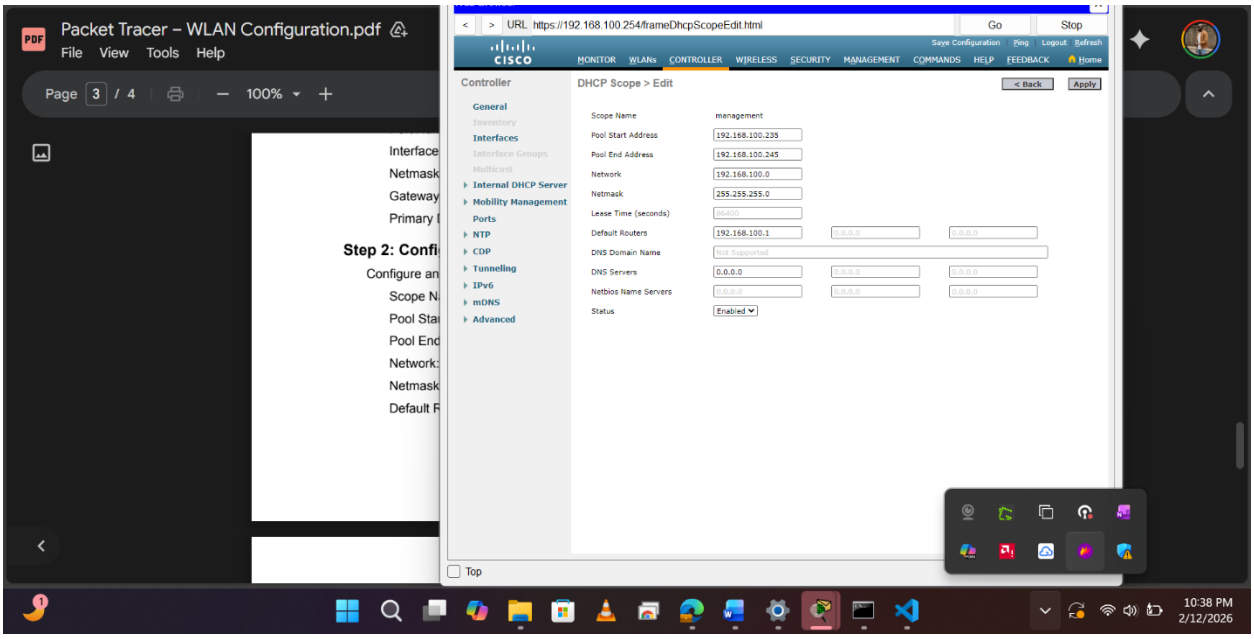


Week 4 Assignment 2

Step 2: Configure a DHCP scope for the wireless management network.

Configure and enable an internal DHCP scope as follows:

Scope Name: **management**
Pool Start Address: **192.168.100.235**
Pool End Address: **192.168.100.245**
Network: **192.168.100.0**
Netmask: **255.255.255.0**
Default Routers: **192.168.100.1**

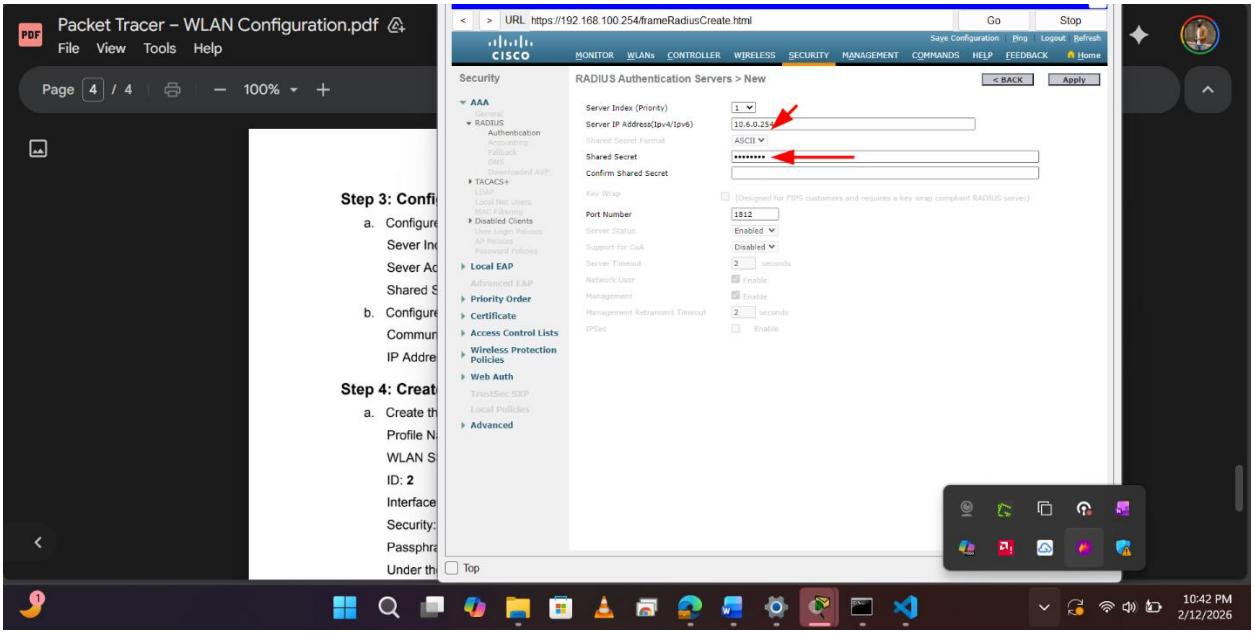


Step 3: Configure the WLC with external server addresses.

a. Configure the RADIUS server information as follows:

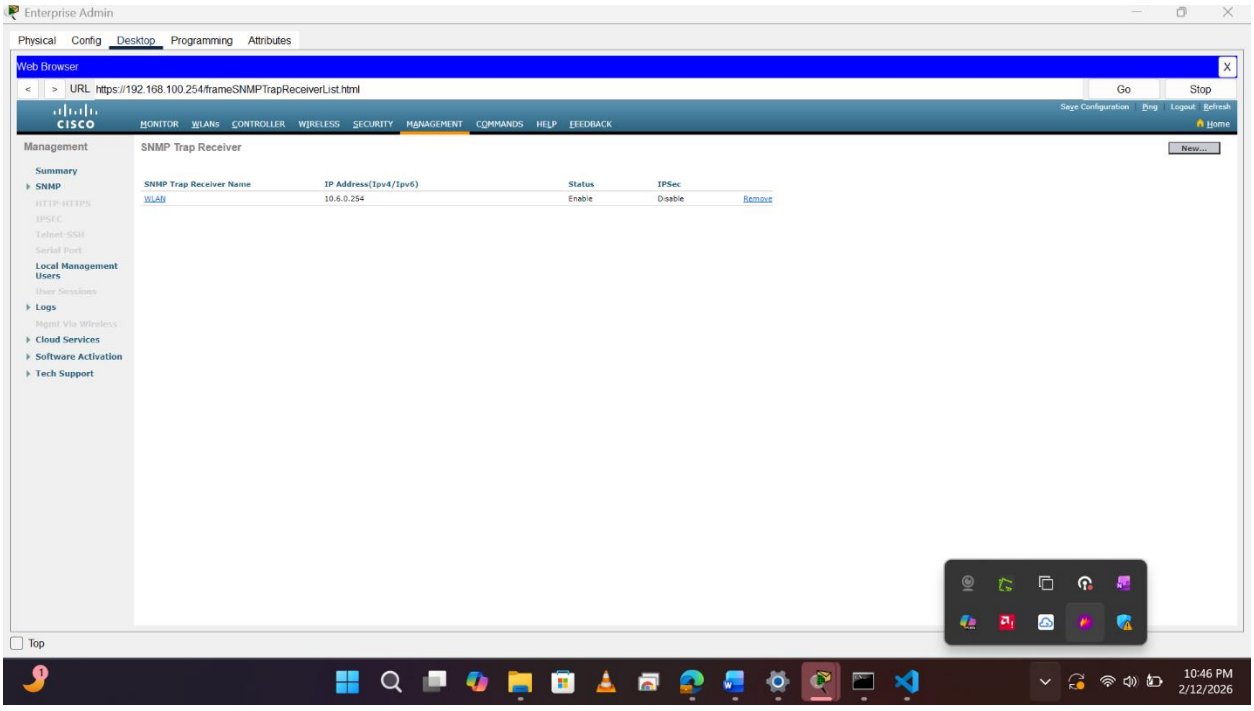
Sever Index: **1**
Sever Address: **10.6.0.254**
Shared Secret: **RadiusPW**

Week 4 Assignment 2



b. Configure the WLC to send logs information to an SNMP server.

Community Name: **WLAN**
IP Address: **10.6.0.254**



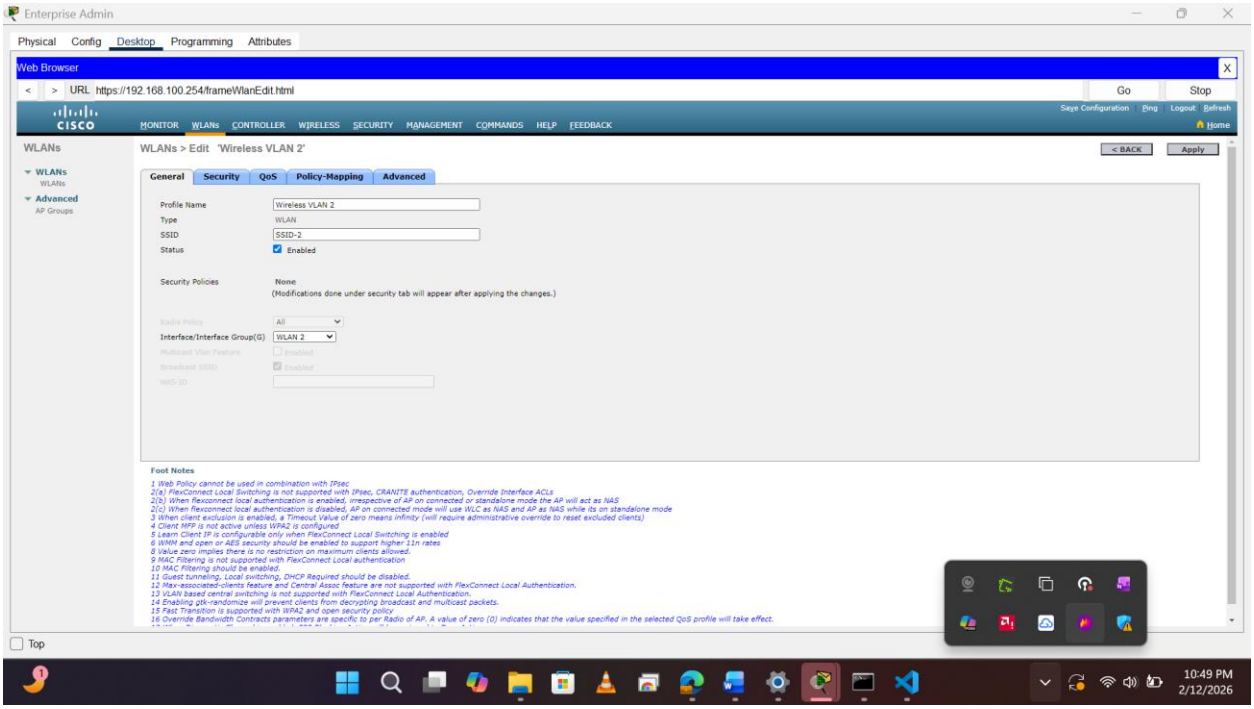
Step 4: Create the WLANs.

a. Create the first WLAN:

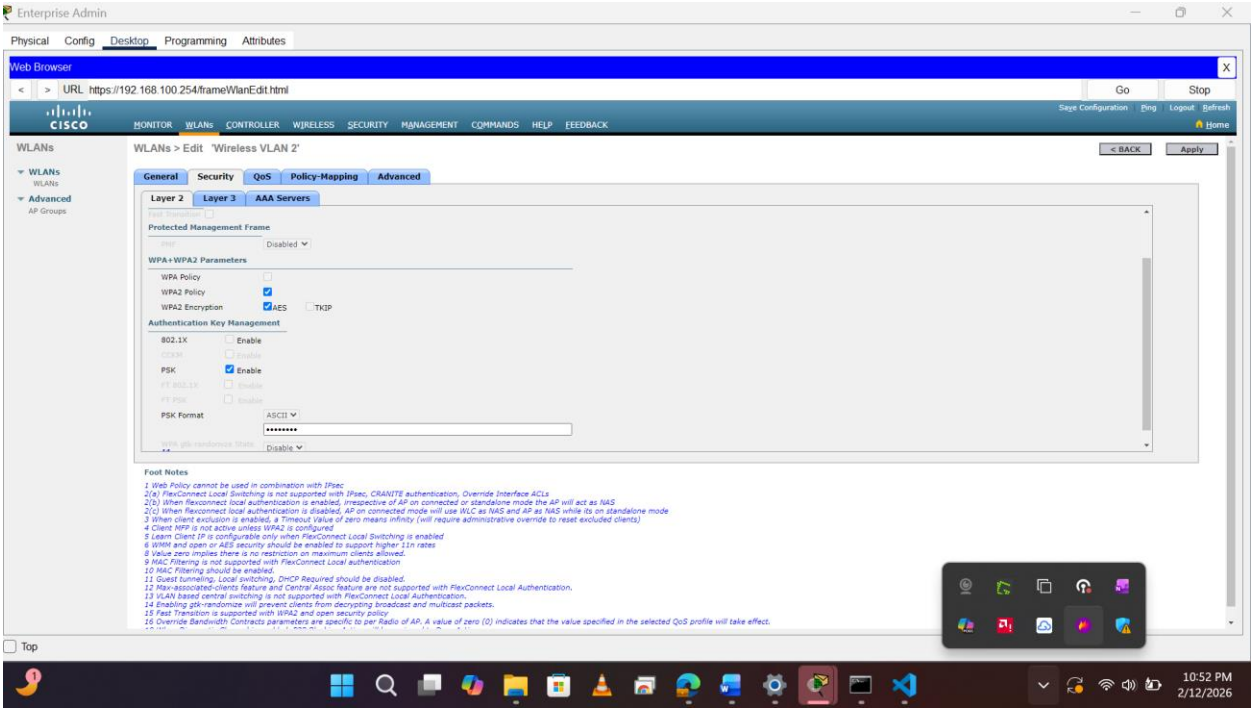
Week 4 Assignment 2

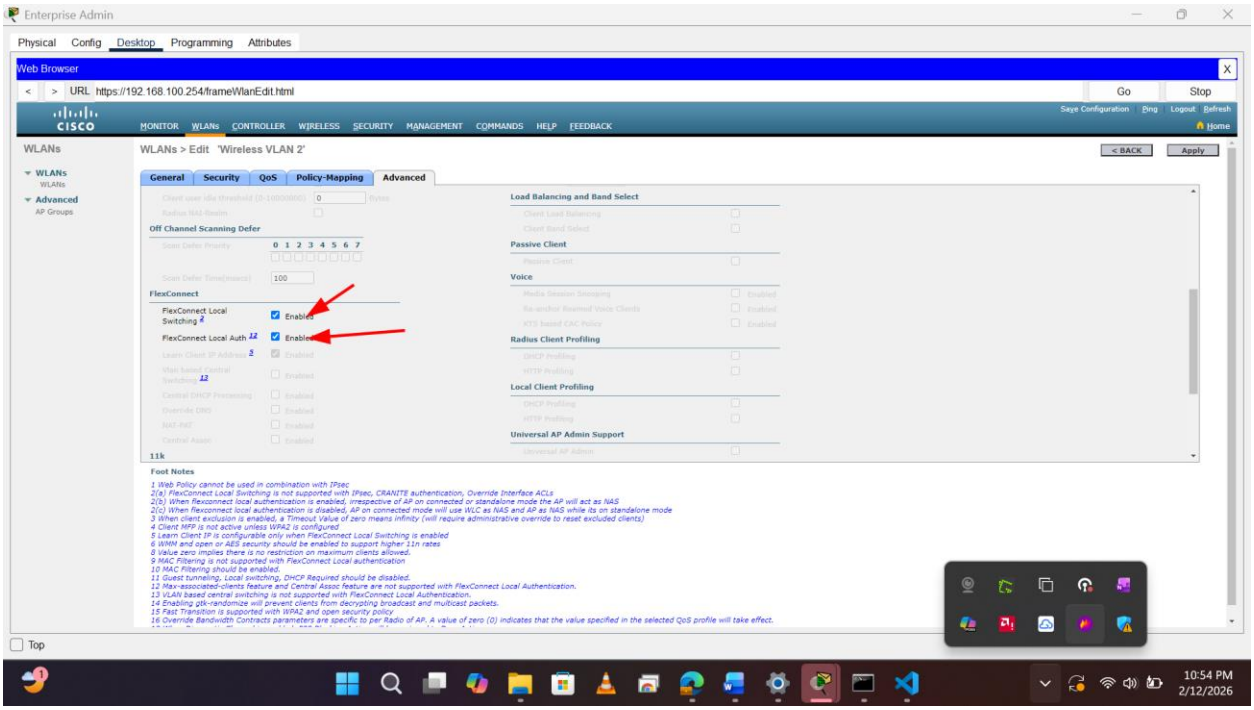
Profile Name: **Wireless VLAN 2**
WLAN SSID: **SSID-2**
ID: **2**
Interface: **WLAN 2**
Security: **WPA2-PSK**
Passphrase: **Cisco123**

Under the Advanced tab, go to the FlexConnect section. Enable **FlexConnect Local Switching** and **FlexConnect Local Auth**.



Week 4 Assignment 2





b. Create the second WLAN:

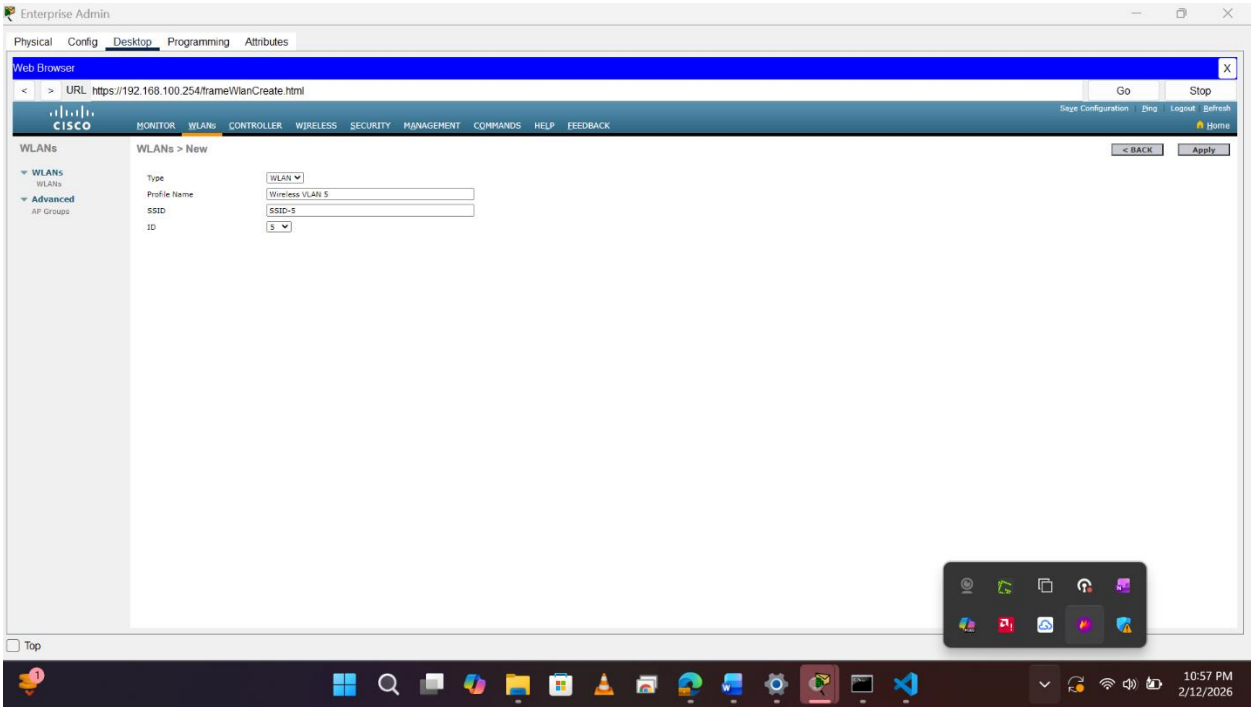
Profile Name: **Wireless VLAN 5**
WLAN SSID: **SSID-5**
Interface: **WLAN** 5
ID: **5**

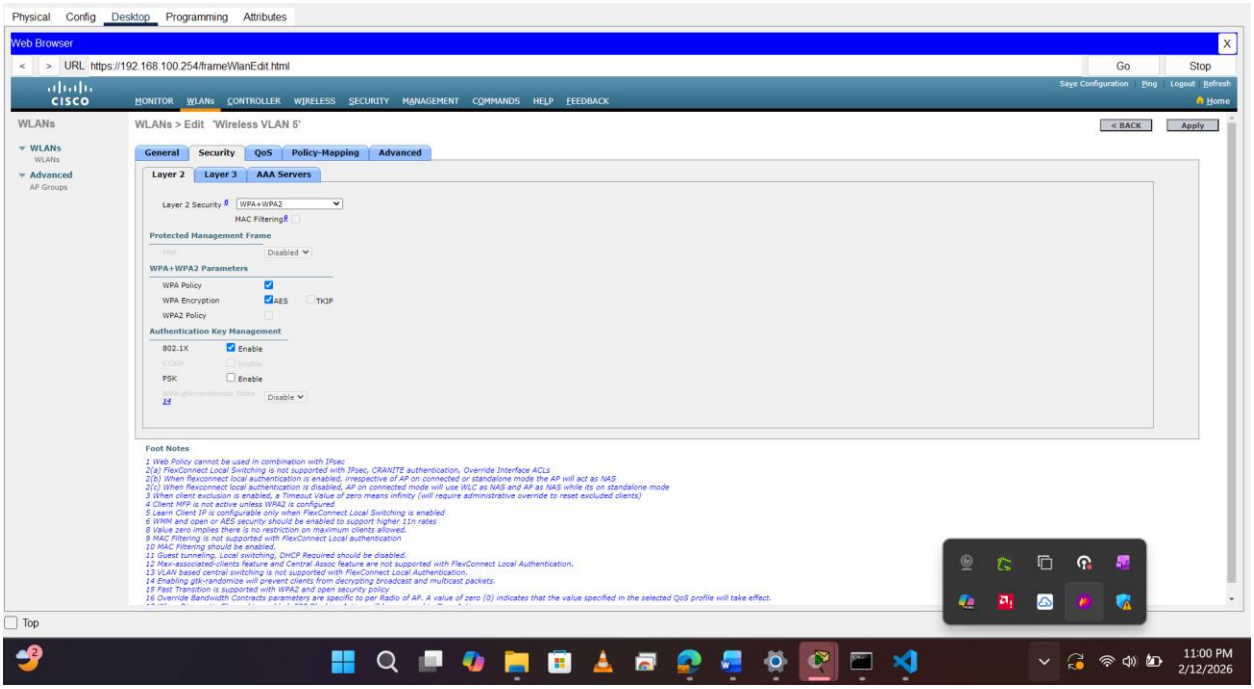
Week 4 Assignment 2

Security: **802.1x – WPA2-Enterprise**

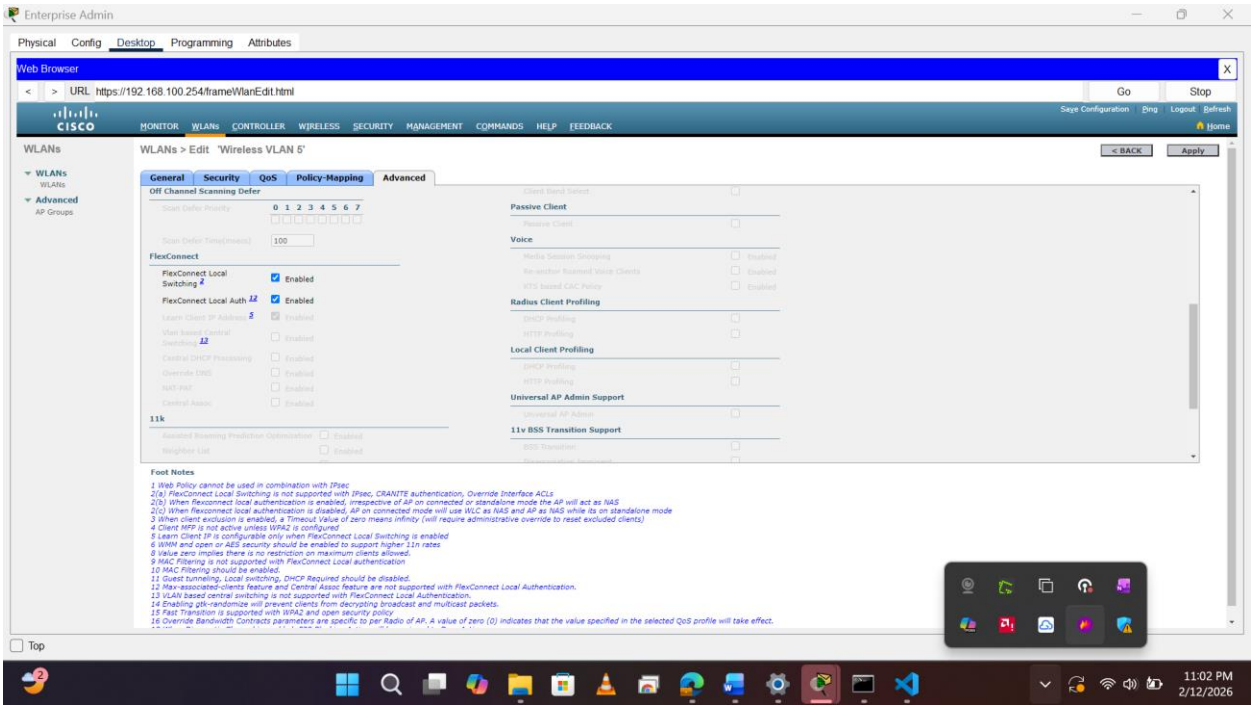
Configure the WLAN to use the RADIUS server for authentication.

Make the **FlexConnect** settings as was done in Step 4a.





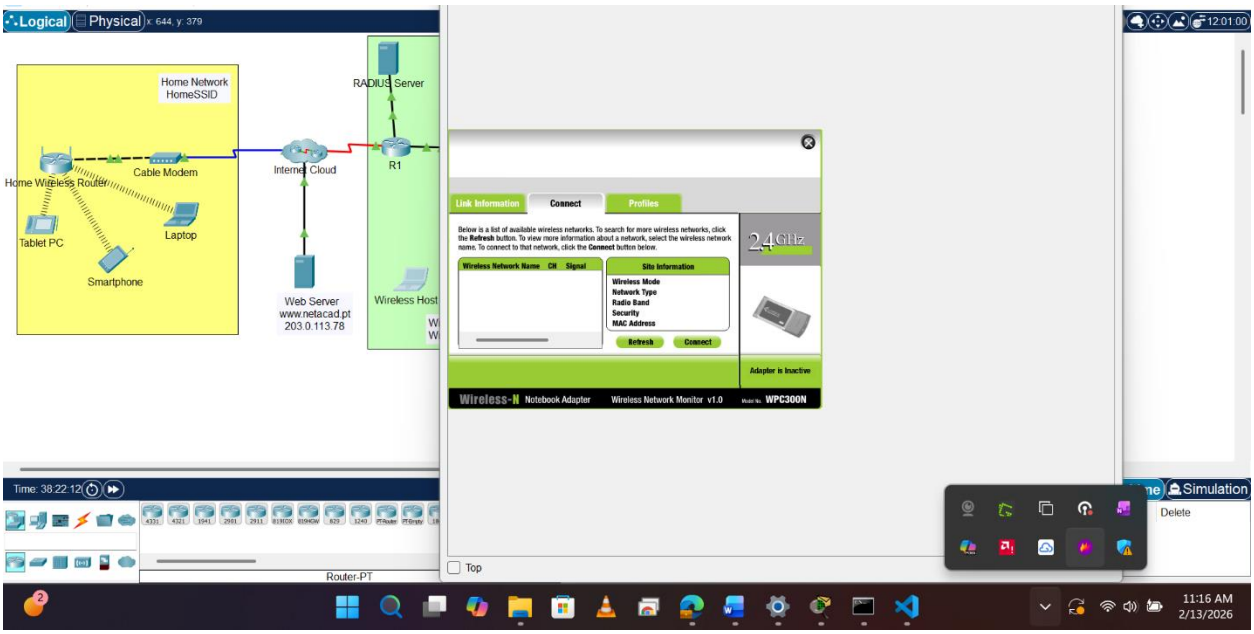
Week 4 Assignment 2



Step 5: Configure the hosts to connect to the WLANs.

Use the desktop PC Wireless app to configure the hosts as follows:

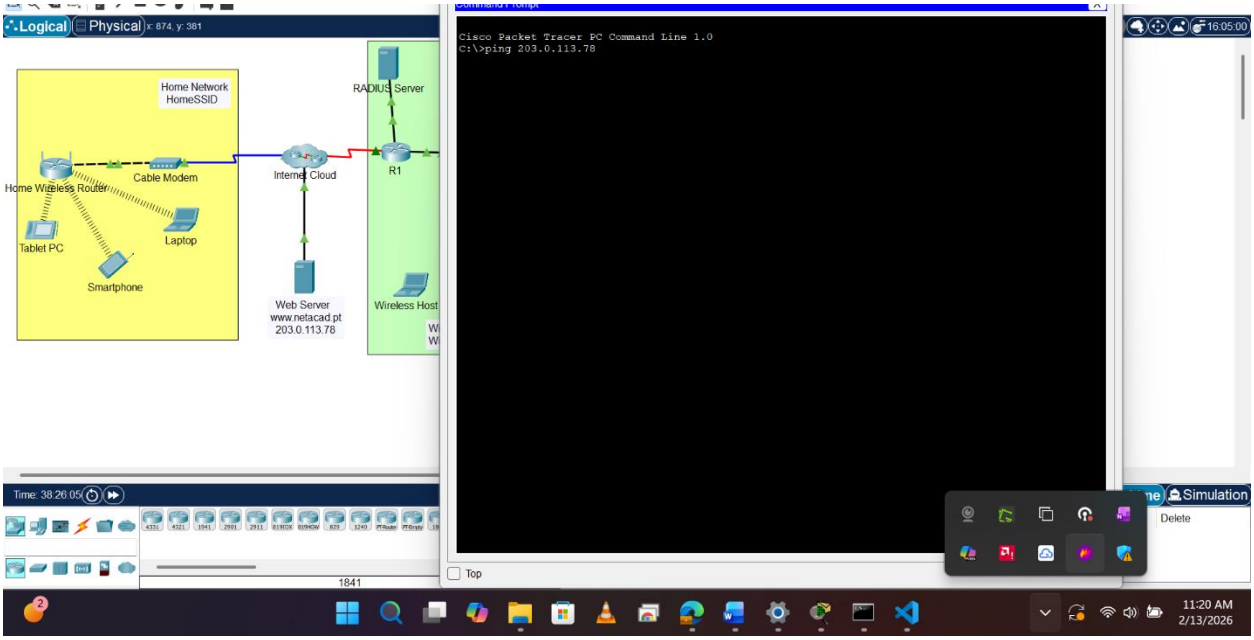
a. Wireless Host 1 should connect to Wireless VLAN 2.



b. Wireless Host 2 should connect to Wireless VLAN 5 using the credentials in the WLAN information table.

Step 6: Test connectivity.

Test connectivity between the wireless hosts and the Web Server by ping and URL.



Conclusion

By completing this exercise, you have successfully deployed and secured wireless networks suited for both home and business use cases.

In the first phase, you demonstrated how to secure a standard home router by changing default management passwords and implementing WPA2-Personal encryption, ensuring that only authorized devices like laptops and tablets could access the local network and the internet.

In the second phase, you navigated the complexities of a centralized wireless architecture using a WLC. You successfully configured VLAN interfaces (WLAN 2 and WLAN 5) and integrated WPA2-Enterprise security, which leverages a RADIUS server for stronger, user-based authentication. Additionally, you utilized advanced features such as FlexConnect to optimize local switching and authentication traffic. The final verification steps, which involved connecting specific hosts to their designated VLANs and performing successful pings to the Web Server, confirm that both the addressing schemes and security policies are functioning correctly. This activity reinforces critical skills in managing wireless infrastructure, distinguishing between personal and enterprise security requirements, and troubleshooting connectivity in a simulated network environment.