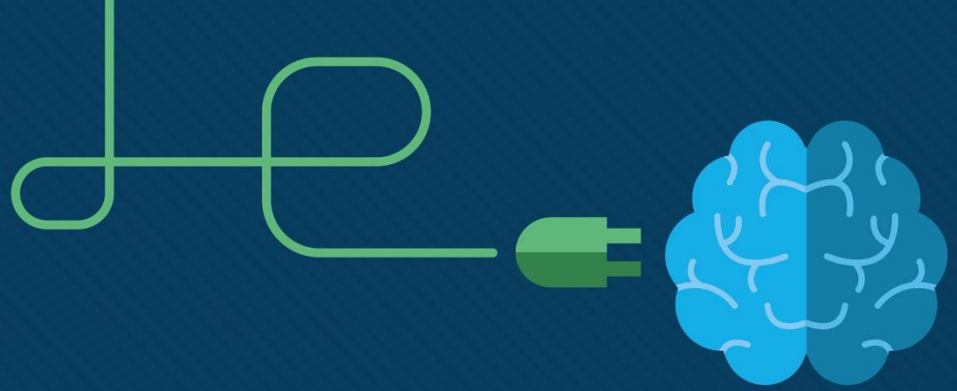


Module 13: WLAN Configuration

Switching, Routing, and Wireless Essentials v7.0 (SRWE)

Module Objectives

Module Title: WLAN Configuration

Module Objective: Implement a WLAN using a wireless router and WLC.

Topic Title	Topic Objective
Remote Site WLAN Configuration	Configure a WLAN to support a remote site.
Configure a Basic WLAN on the WLC	Configure a WLC WLAN to use the management interface and WPA2 PSK authentication.
Configure a WPA2 Enterprise WLAN on the WLC	Configure a WLC WLAN to use a VLAN interface, a DHCP server, and WPA2 Enterprise authentication.
Troubleshoot WLAN Issues	Troubleshoot common wireless configuration issues.

13.1 Remote Site WLAN Configuration

Video – Configure a Wireless Network (See netacad)

This video will cover the following:

- Use the Wireless Router Web Page
- Change the Password
- Change the WAN and LAN settings
- Connect the Wireless Network

Packet Tracer – Configure a Wireless Network

In this Packet Tracer activity, you will complete the following objectives:

- Connect to a wireless router
- Configure the wireless router
- Connect a wired device to the wireless router
- Connect a wireless device to the wireless router
- Add an AP to the network to extend wireless coverage
- Update default router settings

13.2 Configure a Basic WLAN on the WLC

Video – Configure a Basic WLAN on the WLC (See netacad)

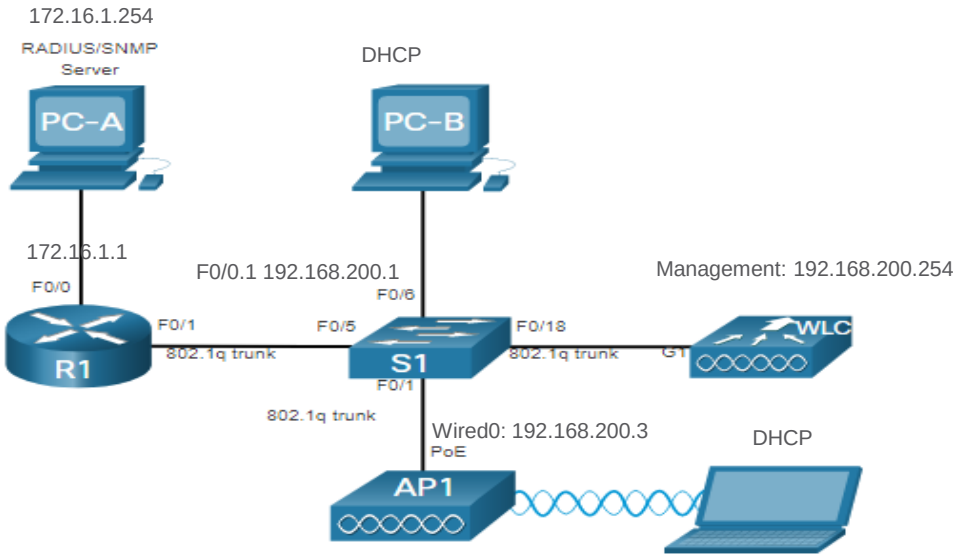
This video will cover the following:

- Review the topology
- Access the GUI for the WLAN controller
- Information about the wireless network on the Network summary screen
- Configure a new WLAN
- Secure the new WLAN

WLC Topology

The topology and addressing scheme used for this topic are shown in the figure and the table.

- The access point (AP) is a controller-based AP as opposed to an autonomous AP, so it requires no initial configuration and is often called lightweight APs (LAPs).
- LAPs use the Lightweight Access Point Protocol (LWAPP) to communicate with a WLAN controller (WLC).
- Controller-based APs are useful in situations where many APs are required in the network.
- As more APs are added, each AP is automatically configured and managed by the WLC.



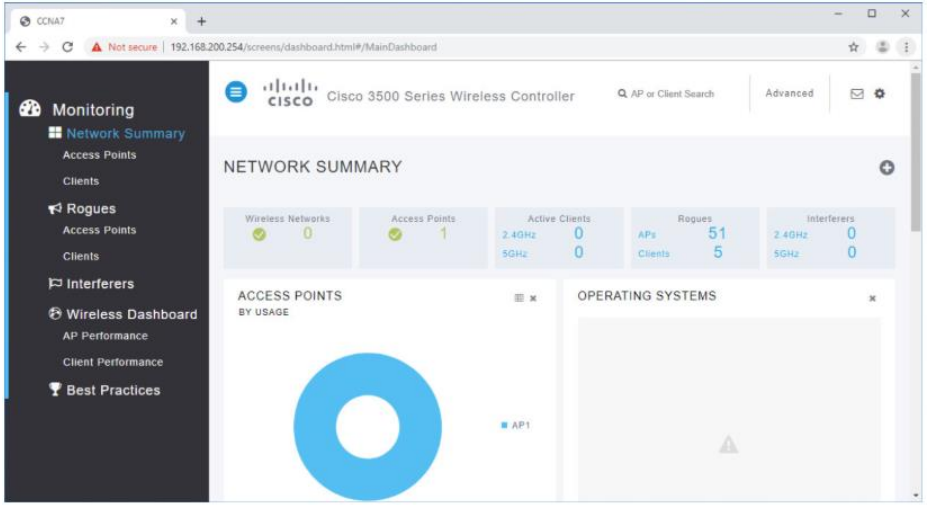
Device	Interface	IP Address	Subnet Mask
R1	F0/0	172.16.1.1	255.255.255.0
R1	F0/1.1	192.168.200.1	255.255.255.0
S1	VLAN 1	DHCP	
WLC	Management	192.168.200.254	255.255.255.0
AP1	Wired 0	192.168.200.3	255.255.255.0
PC-A	NIC	172.16.1.254	255.255.255.0
PC-B	NIC	DHCP	
Wireless Laptop	NIC	DHCP	

Log in to the WLC

Configuring a wireless LAN controller (WLC) is not that much different from configuring a wireless router. The WLC controls APs and provides more services and management capabilities.

- The user logs into the WLC using credentials that were configured during initial setup.

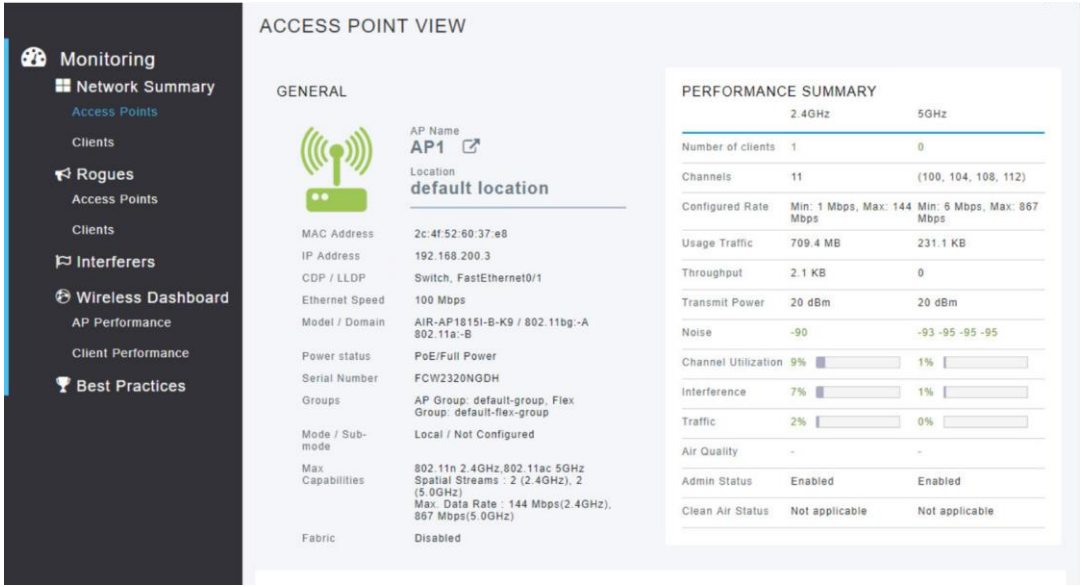
- The **Network Summary** page is a dashboard that provides a quick overview of configured wireless networks, associated access points (APs), and active clients.
- You can also see the number of rogue access points and clients.



View AP Information

Click **Access Points** from the left menu to view an overall picture of the AP's system information and performance.

- The AP is using IP address 192.168.200.3.
- Because Cisco Discovery Protocol (CDP) is active on this network, the WLC knows that the AP is connected to the FastEthernet 0/1 port on the switch.
- This AP in the topology is a Cisco Aironet 1815i which means you can use the command-line and a limited set of familiar IOS commands.

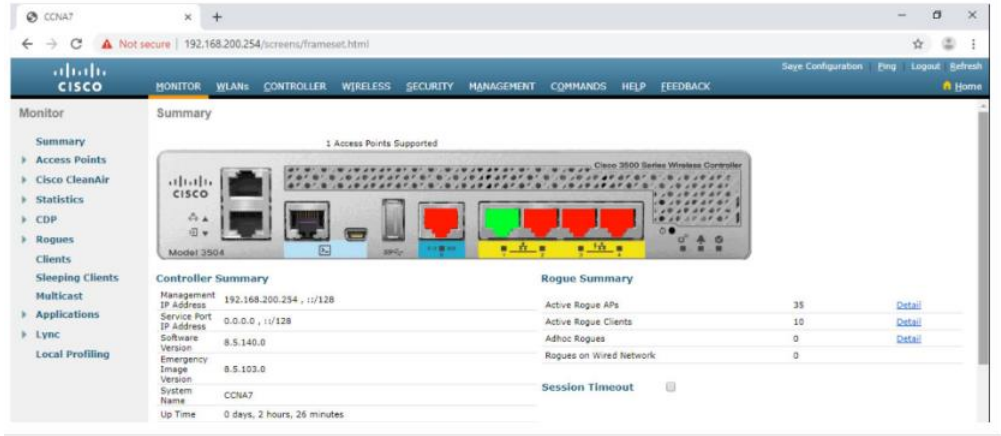


Advanced Settings

Most WLC will come with some basic settings and menus that users can quickly access to implement a variety of common configurations.

- However, as a network administrator, you will typically access the advanced settings.

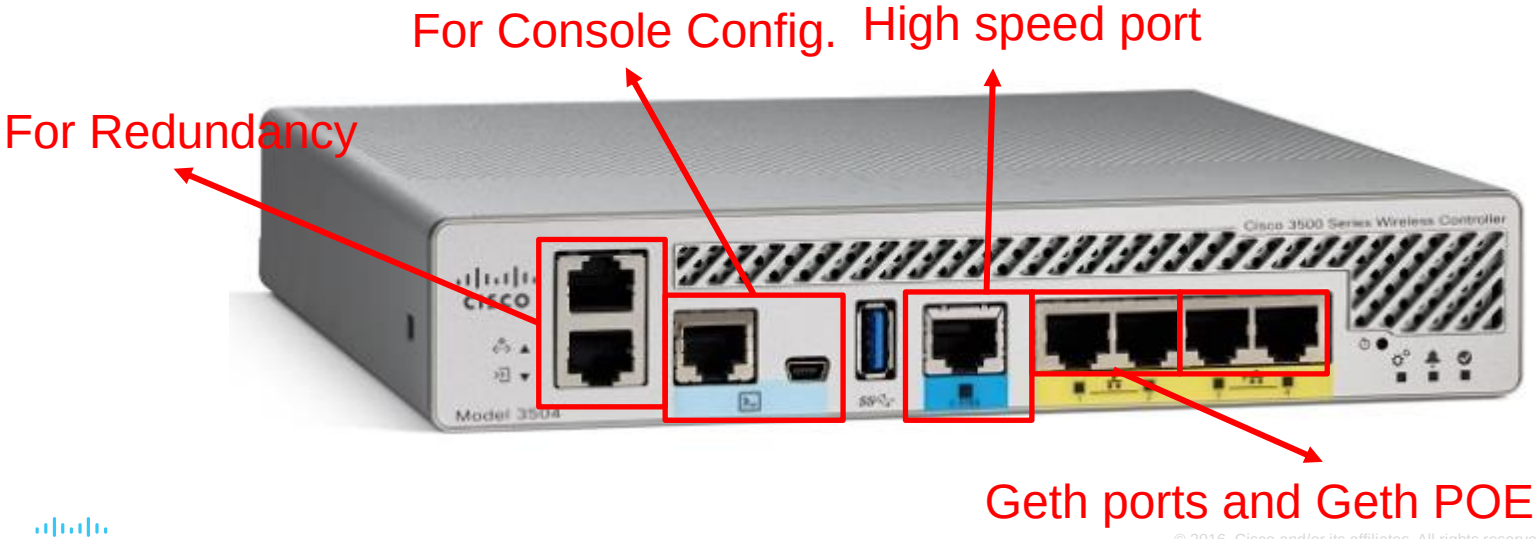
- For the Cisco 3504 Wireless Controller, click **Advanced** in the upper right-hand corner to access the advanced **Summary** page.
- From here, you can access all the features of the WLC.



Configure a WLAN

Wireless LAN Controllers have Layer 2 switch ports and virtual interfaces that are created in software and are very similar to VLAN interfaces.

- Each physical port can support many APs and WLANs.
- The ports on the WLC are essentially trunk ports that can carry traffic from multiple VLANs to a switch for distribution to multiple APs.
- Each AP can support multiple WLANs.



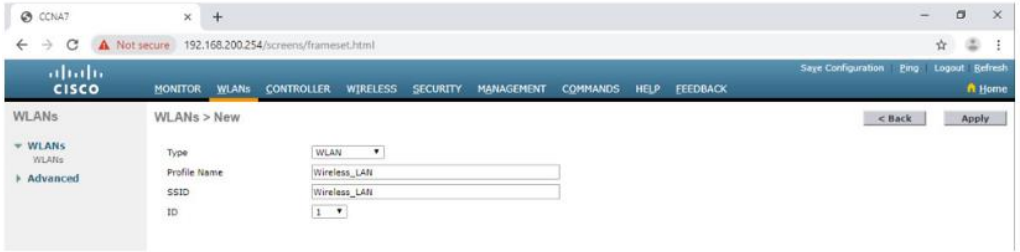
Configure a WLAN (Cont.)

Basic WLAN configuration on the WLC includes the following steps:

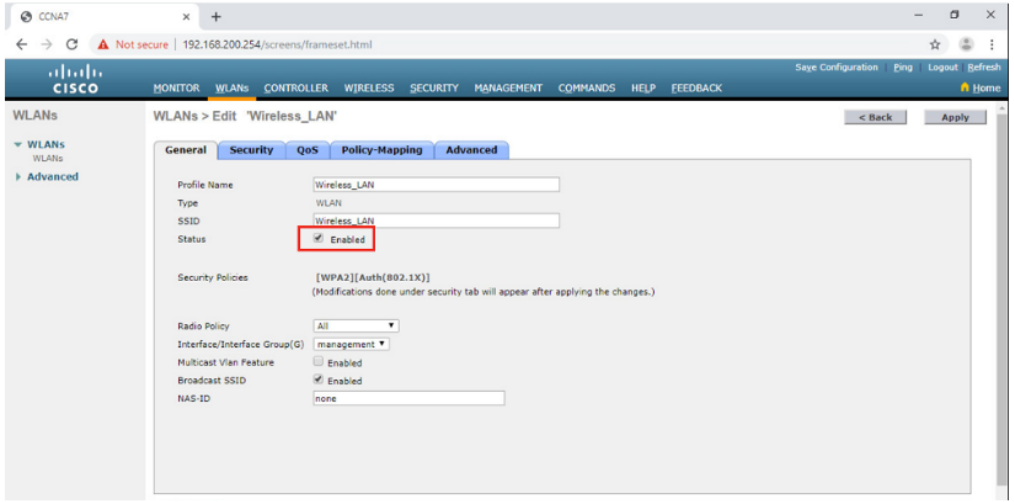
1. Create the WLAN
2. Apply and Enable the WLAN
3. Select the Interface
4. Secure the WLAN
5. Verify the WLAN is Operational
6. Monitor the WLAN
7. View Wireless Client Information

Configure a WLAN (Cont.)

1. **Create the WLAN:** In the figure, a new WLAN with an SSID name **Wireless_LAN** is created.

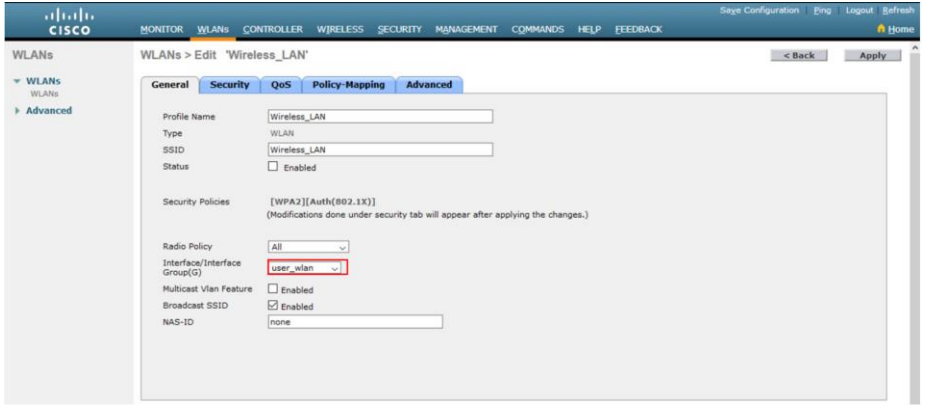


2. **Apply and Enable the WLAN:** Next the WLAN is enabled the WLAN settings are configured.

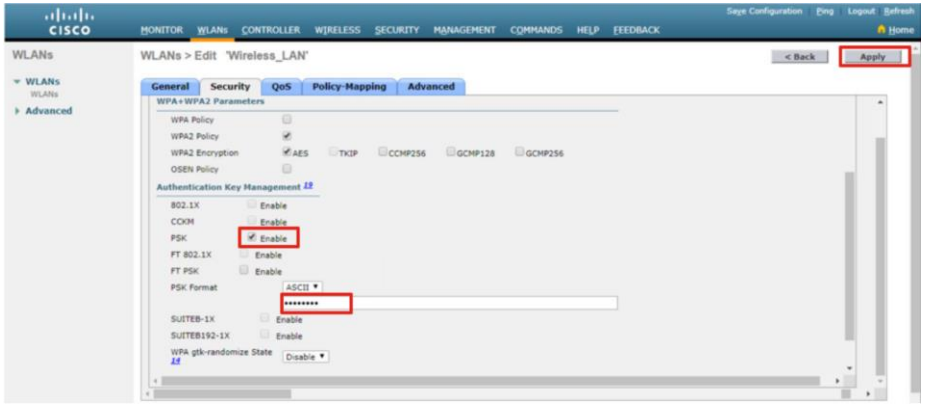


Configure a WLAN (Cont.)

3. **Select the Interface:** The interface that will carry the WLAN traffic must be selected.



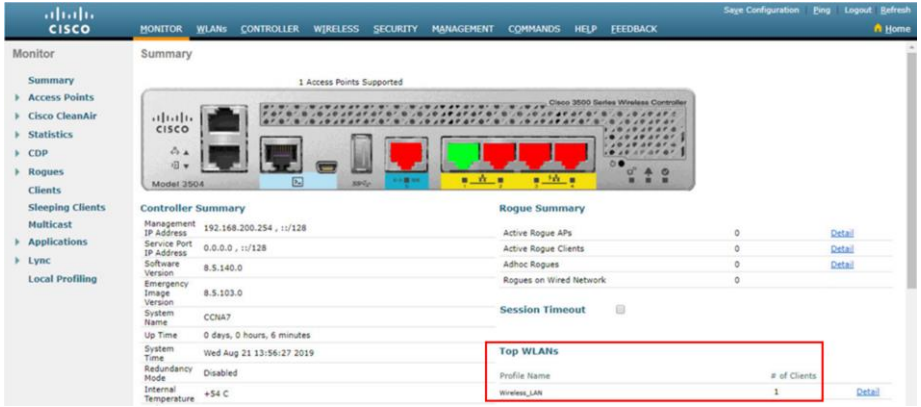
4. **Secure the WLAN**: The Security tab is used to access all the available options for securing the LAN.



Configure a WLAN (Cont.)

5. **Verify the WLAN is Operational:** The **WLANs** menu on the left is used to view the newly configured WLAN and its settings.

6. **Monitor the WLAN**: The **Monitor** tab is used to access the advanced **Summary** page and confirm that the **Wireless_LAN** now has one client using its services.



Configure a WLAN (Cont.)

7. **View Wireless Client Details:** Click **Clients** in the left menu to view more information about the clients connected to the WLAN.

Packet Tracer – Configure a Basic WLAN on the WLC

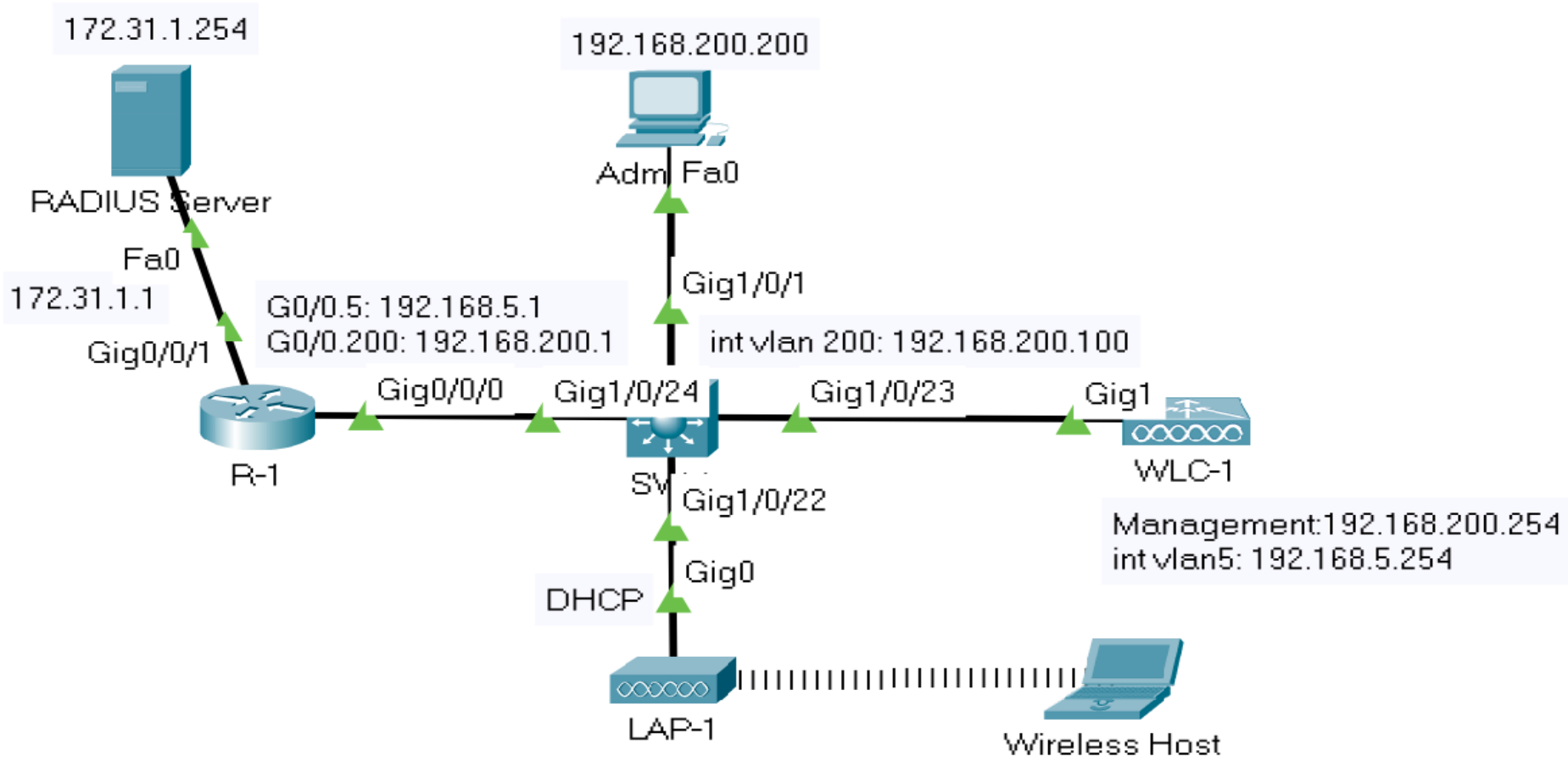
In this lab, you will explore some of the features of a wireless LAN controller.

- You will create a new WLAN on the controller and implement security on that LAN.
- Then you will configure a wireless host to connect to the new WLAN through an AP that is under the control of the WLC.
- Finally, you will verify connectivity.

13.3 Configure a WPA2 Enterprise WLAN on the WLC

Configure a WPA2 Enterprise WLAN on the WLC

Video – Define an SNMP and RADIUS Server on the WLC

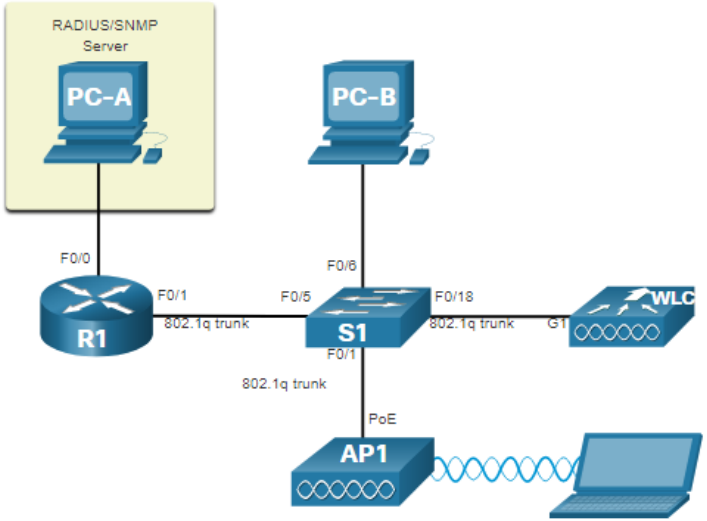


SNMP and RADIUS

PC-A is running Simple Network Management Protocol (SNMP) and Remote Authentication Dial-In User Service (RADIUS) server software.

- The network administrator wants the WLC to forward all SNMP log messages (i.e., traps) to the SNMP server.
- The network administrator wants to use a RADIUS server for authentication, authorization, and accounting (AAA) services.
- Users will enter their username and password credentials which will be verified by the RADIUS server.
- The RADIUS server is required for WLANs that are using WPA2 Enterprise authentication.

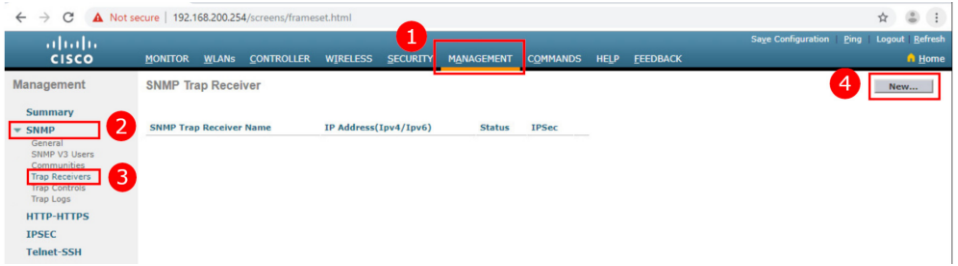
Note: SNMP server and RADIUS server configuration is beyond the scope of this module.



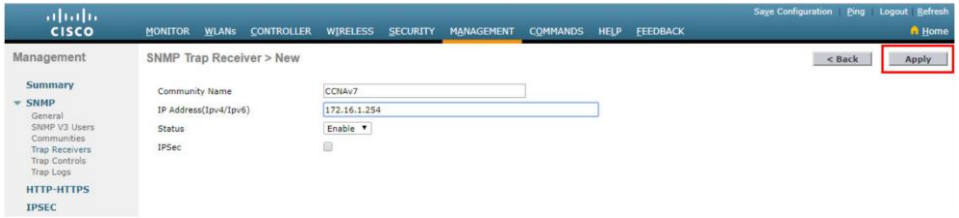
Configure SNMP Server Information

To enable SNMP and configure settings:

1. Click the **MANAGEMENT** tab to access a variety of management features.
2. Click **SNMP** to expand the sub-menus.
3. Click **Trap Receivers**.
4. Click **New...** to configure a new SNMP trap receiver.



- Enter the SNMP Community name and the IP address (IPv4 or IPv6) for the SNMP server and then click **Apply**.
- The WLC will now forward SNMP log messages to the SNMP server.

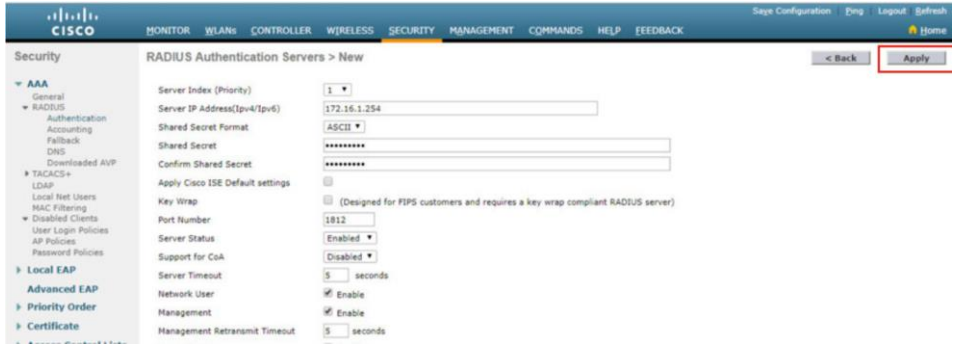


Configure RADIUS Server Information

To configure the WLC with the RADIUS server information:

1. Click **SECURITY.**
2. Click **RADIUS**
3. Click **Authentication**
4. Click **New...** to add PC-A as the RADIUS server.

- Enter the IPv4 address for PC-A and the shared secret that will be used between the WLC and the RADIUS server and then click Apply.



Configure RADIUS Server Information (Cont.)

After clicking **Apply**, the list of configured **RADIUS Authentication Servers** refreshes with the new server listed.

Video – Configure a VLAN for a New WLAN

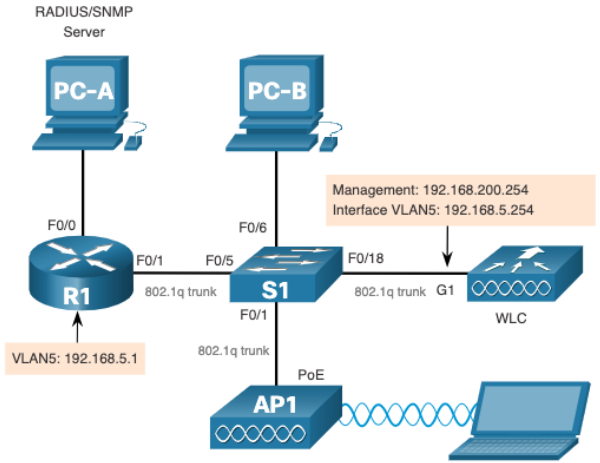
This video will cover the following:

- Review the topology
- Deploy a new VLAN interface
- Associate the new VLAN interface with a WLAN

Topology with VLAN 5 Addressing

Each WLAN configured on the WLC needs its own virtual interface.

- The WLC has five physical data ports that can be configured to support multiple WLANs and virtual interface.
- The new WLAN will use interface VLAN 5 and network 192.168.5.0/24 and therefore R1 has been configured for VLAN 5 as shown in the topology and **show ip interface brief** output.




```
R1# show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0/0            172.16.1.1      YES manual up                    up
FastEthernet0/1            unassigned      YES unset  up                    up
FastEthernet0/1.1          192.168.200.1   YES manual up                    up
FastEthernet0/1.5          192.168.5.254   YES manual up                    up
(output omitted)
R1#
```

Configure a New Interface

VLAN interface configuration on the WLC includes the following steps:

1. Create a new interface.
2. Configure the VLAN name and ID.
3. Configure the port and interface address.
4. Configure the DHCP server address.
5. Apply and Confirm.
6. Verify Interfaces.

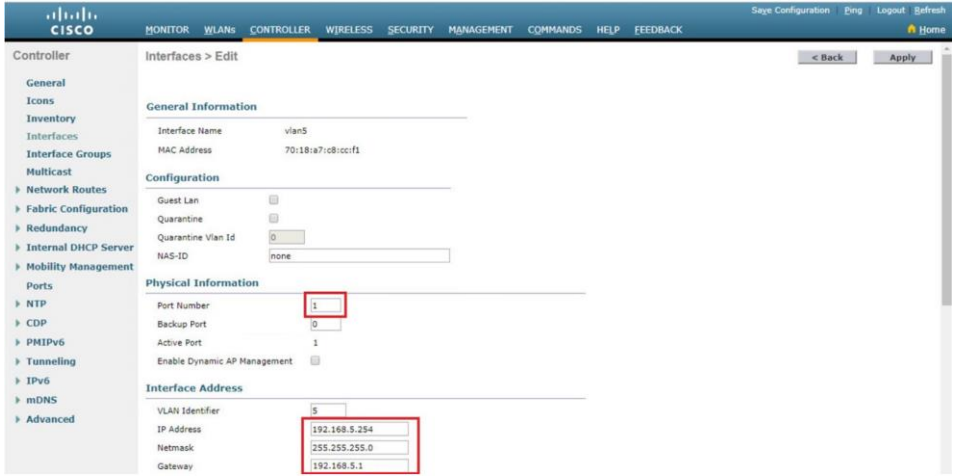
Configure a New Interface (Cont.)

1. **Create a new interface:** Click **CONTROLLER > Interfaces > New...**

2. **Configure the VLAN name and ID:** In the example, the new interface is named **vlan5**, the VLAN ID is **5**, and applied.

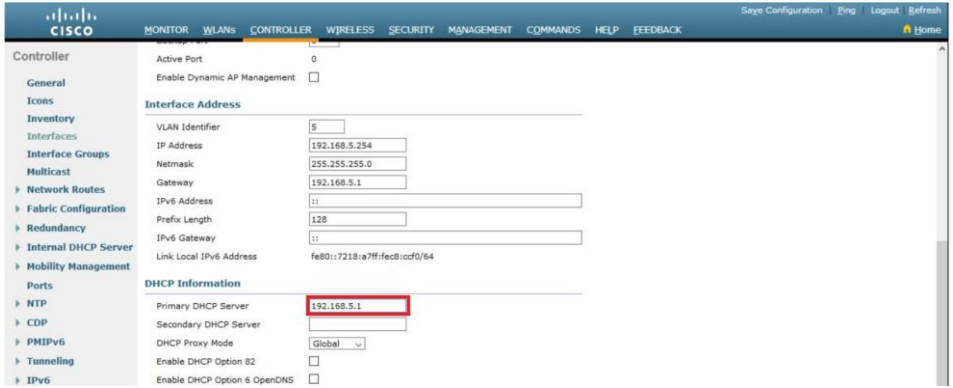
Configure a New Interface (Cont.)

3. **Configure the port and interface address:** On the interface **Edit** page, configure the physical port number (i.e., the WLC G1 interface is Port Number 1 on the WLC), the VLAN 5 interface addressing (i.e., 192.168.5.254/24), and the default gateway (i.e., 192.168.5.1)

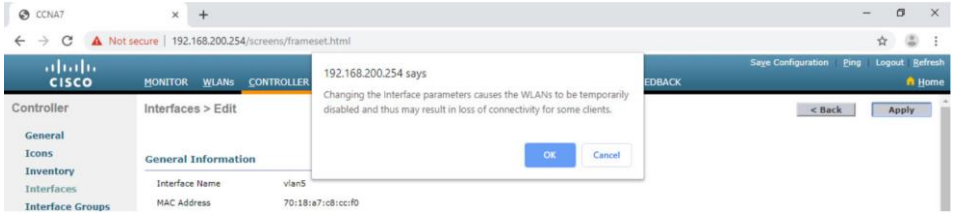


Configure a New Interface (Cont.)

4. **Configure the DHCP server address:** The example configures a primary DHCP server at IPv4 address 192.168.5.1 which is the default gateway router address which is enabled as a DHCP server.

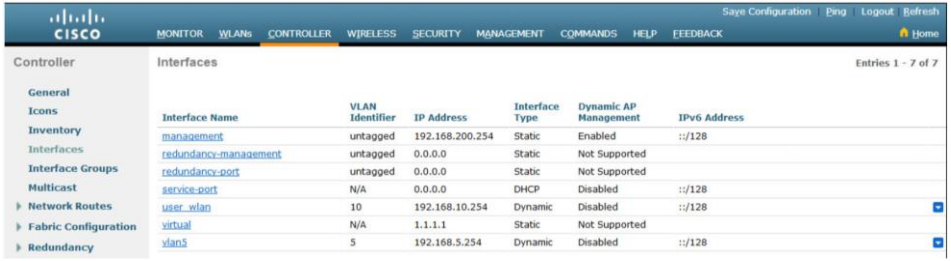


5. **Apply and Confirm:** Scroll to the top and click **Apply** and then click **OK** for the warning message.



Configure a New Interface (Cont.)

6. **Verify Interfaces:** Click **Interfaces** to verify that the new **vlan5** interface is shown in the list of interfaces with its IPv4 address.



Video – Configure a DHCP Scope

This video will cover the following:

- Review the topology
- Explain the role of the WLC DHCP server
- Create a new DHCP scope

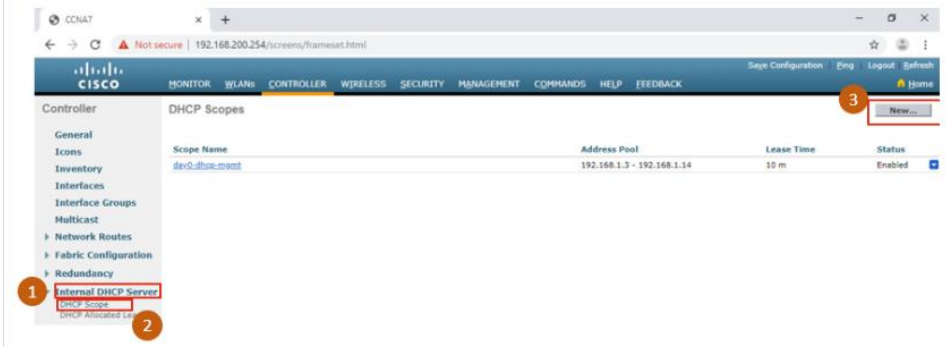
Configure a DHCP Scope

DHCP scope configuration includes the following steps:

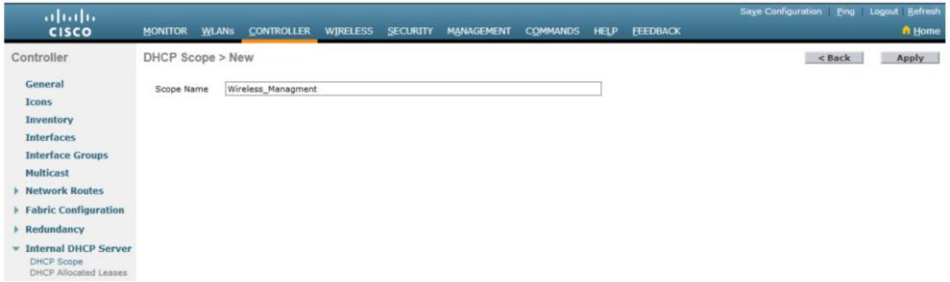
1. Create a new DHCP scope.
2. Name the DHCP scope.
3. Verify the new DHCP scope.
4. Configure and enable the new DHCP scope.
5. Verify the enable DHCP scope

Configure a DHCP Scope (Cont.)

1. **Create a new DHCP scope:** To configure a new DHCP scope, click **Internal DHCP Server > DHCP Scope > New....**



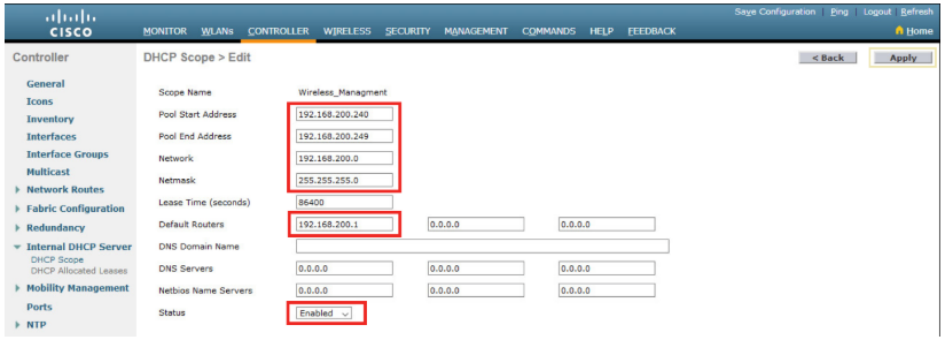
2. **Name the DHCP scope:** The scope is named **Wireless_Management** and then applied.



Configure a DHCP Scope (Cont.)

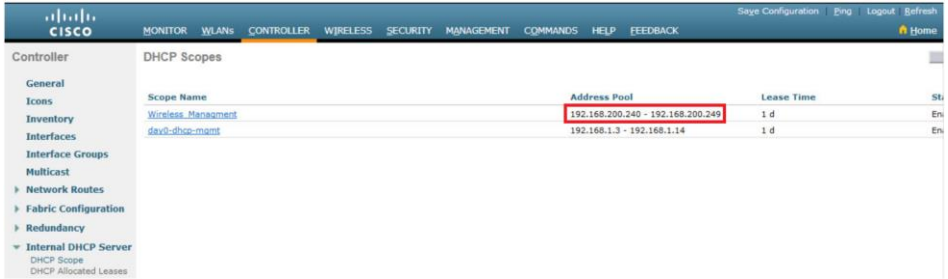
3. **Verify the new DHCP scope:** In the **DHCP Scopes** page click the new Scope Name to configure the DHCP scope.

4. **Configure and enable the new DHCP scope:** On the Edit screen for the **Wireless_Management** scope, configure a pool of addresses (i.e., 192.168.200.240/24 to .249), the default router IPv4 address (i.e., 192.168.200.1), then **Enabled** and **Apply**.



Configure a DHCP Scope (Cont.)

5. **Verify the enable DHCP scope:** The network administrator is returned to the **DHCP Scopes** page and can verify the scope is ready to be allocated to a new WLAN.



Video – Configure a WPA2 Enterprise WLAN

This video will cover the following:

- Review the topology
- Create a WLAN
- Configure the WLC to use the RADIUS server
- Secure the new WLAN with WPA2-Enterprise
- Verify WPA2-Enterprise Security

Configure a WPA2 Enterprise WLAN

By default, all newly created WLANs on the WLC will use WPA2 with Advanced Encryption System (AES).

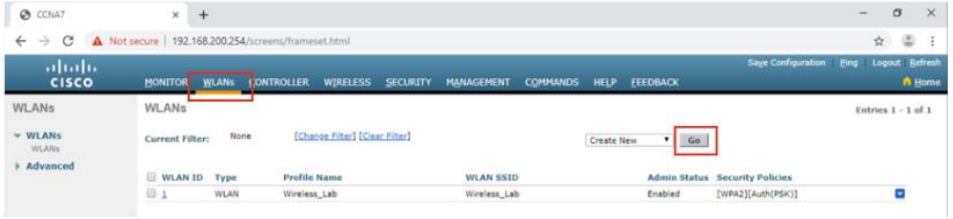
- 802.1X is the default key management protocol used to communicate with the RADIUS server.
- Next, create a new WLAN to use interface **vlan5**.

Configuring a new WLAN on the WLC includes the following steps:

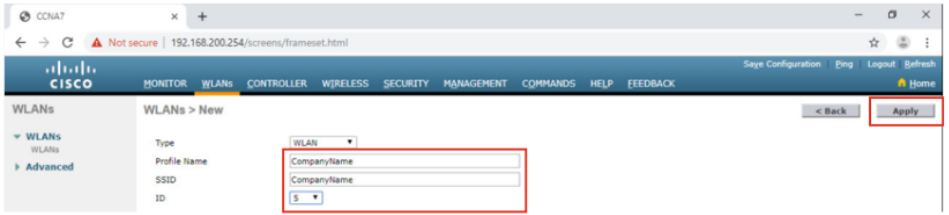
1. Create a new WLAN.
2. Configure the WLAN name and SSID.
3. Enable the WLAN for VLAN 5.
4. Verify AES and 802.1X defaults.
5. Configure WLAN security to use the RADIUS server.
6. Verify the new WLAN is available.

Configure a WPA2 Enterprise WLAN (Cont.)

1. **Create a new WLAN:** Click the **WLANs** tab and then **Go** to create a new WLAN.

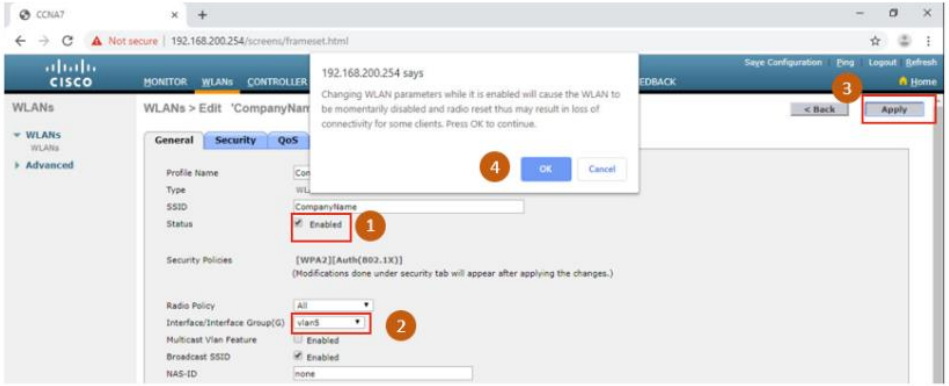


2. **Configure the WLAN name and SSID:** Enter the profile name and SSID, choose an ID of **5**, and then click **Apply** to create the new WLAN.

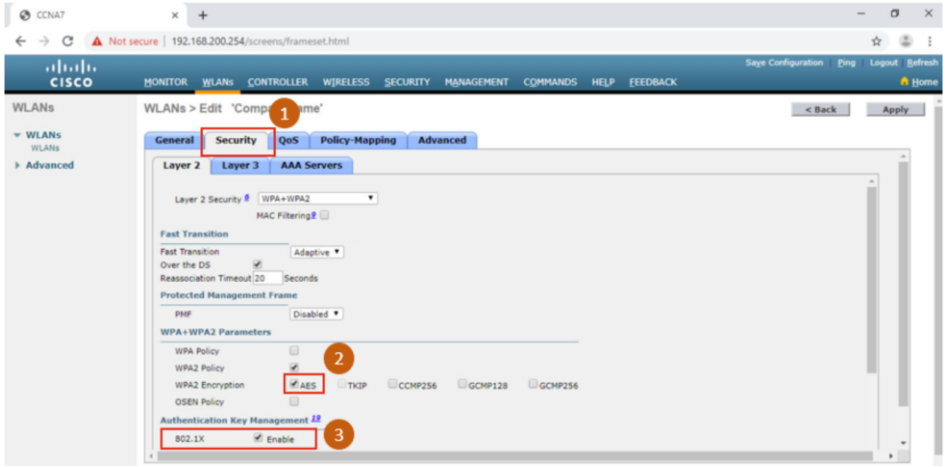


Configure a WPA2 Enterprise WLAN (Cont.)

3. **Enable the WLAN for VLAN 5:** Once the WLAN, change the status to **Enabled**, choose **vlan5** from the Interface/Interface Group(G) dropdown list, and then click **Apply** and click **OK** to accept the popup message.

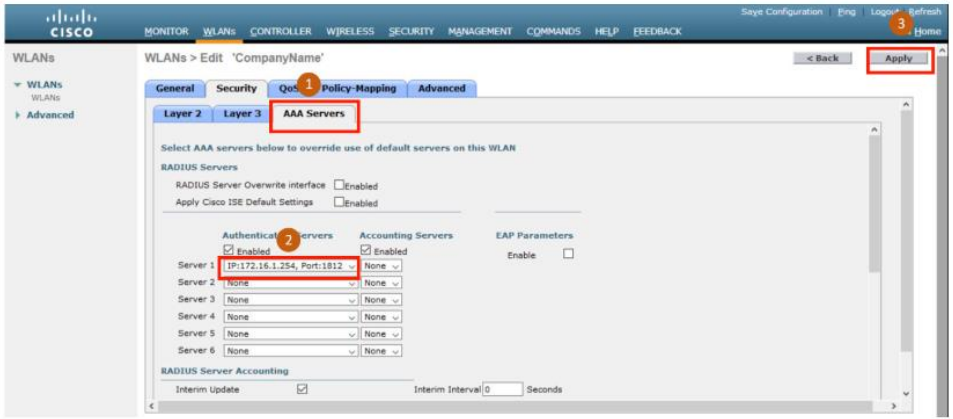


4. **Verify AES and 802.1X defaults:** Click the **Security** tab to view the default security configuration for the new WLAN.



Configure a WPA2 Enterprise WLAN (Cont.)

5. **Configure the RADIUS server:** To select the RADIUS server that will be used to authenticate WLAN users, click the **AAA Servers** tab and in the dropdown box, select the RADIUS server that was configured on the WLC previously, and then **Apply** your changes.



6. **Verify that the new WLAN is available:** To verify that the new WLAN is listed and enabled click on the **WLANs** submenu.

Packet Tracer – Configure a WPA2 Enterprise WLAN on the WLC

In this Packet Tracer activity, you will configure a new WLAN on a wireless LAN controller (WLC), including the VLAN interface that it will use. You will configure the WLAN to use a RADIUS server and WPA2-Enterprise to authenticate users. You will also configure the WLC to use an SNMP server.

- Configure a new VLAN interface on a WLC.
- Configure a new WLAN on a WLC.
- Configure a new scope on the WLC internal DHCP server.
- Configure the WLC with SNMP settings.
- Configure the WLC to use a RADIUS server to authenticate WLAN users.
- Secure a WLAN with WPA2-Enterprise.
- Connect hosts to the new WLC.

13.5 Module Practice and Summary