

Lab 6 - Configure a WLAN on the WLC

Addressing Table

Device	Interface	IP Address
R-1	G0/0/1	172.31.1.1/24
	G0/0/0.5	192.168.5.1/24
	G0/0/0.200	192.168.200.1/24
SW-1	VLAN 200	192.168.200.100/24
LAP-1	G0	DHCP
WLC-1	Management	192.168.200.254/24
Server	NIC	172.31.1.254/24
Admin PC	NIC	192.168.200.200/24
Wireless Host	Wireless NIC	DHCP

Objectives

In this lab, you will explore some of the features of a wireless LAN controller. You will create a new WLAN on the controller, including the VLAN interface that it will use. You will 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.

- Connect to a wireless LAN controller GUI.
- Explain some of the information that is available on the WLC Monitor screen.
- Configure a new VLAN interface on a WLC.
- Configure a new scope on the WLC internal DHCP server.
- Configure a WLAN on a wireless LAN controller.
- Implement security on a WLAN.
- Configure a wireless host to connect to a wireless LAN.

Background / Scenario

An organisation is centralising control of their wireless LAN by replacing their standalone access points with lightweight access points (LAP) and a wireless LAN controller (WLC). You will be leading this project and you want to become familiar with the WLC and any potential challenges that may occur during the project. You will configure a WLC by creating a new VLAN interface, use that interface to create a new WLAN and secure it with WPA-2 PSK security. In addition, you will configure the WLC to use an internal DHCP server. To test the configuration, you will connect a laptop to the WLAN and ping devices on the network.

Instructions

Part 1: Monitor the WLC

Wait until STP has converged on the network. You can click the Packet Tracer Fast Forward Time button to speed up the process. Continue when all link lights are green.

- Go the desktop of **Admin PC** and open a browser. Enter the management IP address of **WLC-1** from the addressing table into the address bar. You must specify the **HTTPS** protocol.
- Click **Login** and enter these credentials: User Name: **admin**, Password: **Cisco123**. After a short delay, you will see the WLC Monitor Summary screen.

Note: Packet Tracer does not support the Network Summary dashboard that has been demonstrated in the lecture.

- Scroll through the Monitor Summary screen.

- QUESTION 1:** How many APs, are currently showing in the Monitor Summary dashboard as being connected to the WLC?
- QUESTION 2:** How many clients are currently showing as being connected to the WLC?
- QUESTION 3:** How many Rogue APs are currently showing in the Monitor Summary dashboard?

Before proceeding, go to the “Lab 6 - Configure a WLAN on the WLC - QUESTIONS” quiz on the Moodle page and enter your answers for questions 1-3. Leave the quiz open while you complete the rest of the lab sheet.

Part 2: Create a Wireless LAN

Now you will create a new wireless LAN on the WLC. You will configure the settings that are required for hosts to join the WLAN.

Step 1: Create a new VLAN interface.

Each WLAN requires a virtual interface on the WLC. These interfaces are known as dynamic interfaces. The virtual interface is assigned a VLAN ID and traffic that uses the interface will be tagged as VLAN traffic. This is why connections between the APs, the WLC, and the router are over trunk ports. For the traffic from multiple WLANs to be transported through the network, traffic for the WLAN VLANs must be trunked.

- a. Click the **Controller** menu and then click **Interfaces** from the menu on the left. You will see the default virtual interface and the management interface to which you are connected.
- b. Click the **New** button in the upper right-hand corner of the page. You may need to scroll the page to the right to see it.
- c. Enter the name of the new interface. We will call it **WLAN-5**. Configure the VLAN ID as **5**. This is the VLAN that will carry traffic for the WLAN that we create later. Click **Apply**. This leads to a configuration screen for the VLAN interface.
- d. First, configure the interface to use physical port number **1**. Multiple VLAN interfaces can use the same physical port because the physical interfaces are like dedicated trunk ports.

- e. Address the interface as follows:

IP Address: **192.168.5.254**

Netmask: **255.255.255.0**

Gateway: **192.168.5.1**

Primary DHCP server: **192.168.5.1**

User traffic for the WLAN that uses this VLAN interface will be on the 192.168.5.0/24 network. The default gateway is the address of an interface on router R-1. A DHCP pool has been configured on the router. The address that we configure here for DHCP tells the WLC to forward all DHCP requests that it receives from hosts on the WLAN to the DHCP server on the router.

- f. Be sure to click **Apply** to enact your changes and click **OK** to respond to the warning message. Click **Save Configuration** so that your configuration will be in effect when the WLC restarts.

Step 2: Create and enable the WLAN.

- a. Click **WLANs** in the WLC menu bar. Locate the dropdown box in the upper right hand corner of the WLANs screen. It will say **Create New**. Click **Go** to create a new WLAN.
- b. Enter the **Profile Name** of the new WLAN. Use the profile name **Floor 2 Employees**. Assign an SSID of **SSID-5** to the WLAN. Hosts will need to use this SSID to join the network.
- c. Select the **ID** for the WLAN. This value is a label that will be used to identify the WLAN in other displays. Select a value of **5** to keep it consistent with the VLAN number and SSID. This is not a requirement but it helps with understanding the topology.
- d. Click **Apply** so that the settings go into effect.
- e. Now that the WLAN has been created, you can configure features of the network. Click **Enabled** to make the WLAN functional. It is a common mistake to accidentally skip this step.
- f. Choose the VLAN interface that will be used for the WLAN. The WLC will use this interface for user traffic on the network. Click the drop-down box for Interface/Interface Group (G). Select the interface that we created in Step 1.
- g. Click the **Advanced** tab.
- h. Scroll down to the FlexConnect portion of the page. Click to enable **FlexConnect Local Switching** and **FlexConnect Local Auth**.
- i. Click **Apply** to enable the new WLAN. If you forget to do this, the WLAN will not operate.

Step 3: Secure the WLAN.

The new WLAN currently has no security in place. This WLAN will initially use WPA2-PSK security. In another activity, you will configure the WLAN to use WPA2-Enterprise, a much better solution for larger wireless networks.

- a. In the WLANs Edit screen for the Floor 2 Employees WLAN, click the **Security** tab. Under the **Layer 2** tab, select **WPA+WPA2** from the **Layer 2 Security** drop down box. This will reveal the WPA parameters.
- b. Click the checkbox next to **WPA2 Policy**. This will reveal additional security settings. Under **Authentication Key Management**, enable **PSK**.
- c. Now you can enter the pre-shared key that will be used by hosts to join the WLAN. Use **Cisco123** as the passphrase.
- d. Click **Apply** to save these settings.

Note: It is **not a good practice to reuse passwords** when configuring security. We have reused passwords in this lab to simplify configuration.

Step 4: Verify the Settings

- After Applying the configuration, click **Back**. This will take you back to the WLANs screen.

QUESTION 4: What information about the new WLAN is available on this screen?

Before proceeding, return to the quiz on the Moodle page and enter your answer for question 4. Leave the quiz open while you complete the rest of the lab sheet.

- If you click the WLAN ID, you will be taken to the WLANs Edit screen. Use this to verify and change the details of the settings.

Part 3: Configure a DHCP Scope

Step 1: Configure a DHCP Scope.

The WLC offers its own internal DHCP server. Cisco recommends that the WLAN DHCP server not be used for high-volume DHCP services, such as that required by larger user WLANs. However, in smaller networks, the DHCP server can be used to provide IP addresses to LAPs that are connected to the wired management network. In this step, we will configure a DHCP scope on the WLC and use it to address LAP-1.

- Should be connected to the WLC GUI from Admin PC.
- Click the **Controller** menu and then click **Interfaces**.
- Click the **management** Interface. Record its addressing information here.
IP address: _____
Netmask: _____
Gateway: _____
- We want the WLC to use its own DHCP sever to provide addressing to devices on the wireless management network, such as lightweight APs. For this reason, enter the IP address of the WLC management interface as the primary DHCP server address. Click **Apply**. Click **OK** to acknowledge any warning messages that appear.
- In the left-hand menu, expand the **Internal DHCP Server** section. Click **DHCP Scope**.
- To create a DHCP scope, click the **New...** button.
- Name the scope **Management Network**. You will configure this DHCP scope to provide addresses to the wired infrastructure network that connects the Admin PC, WLC-1, and LAP-1.
- Click **Apply** to create the new DHCP scope.
- Click the new scope in the DHCP Scopes table to configure addressing information for the scope. Enter the following information.

Pool Start Address: **192.168.200.240**

Pool End Address: **192.168.200.250**

Status: **Enabled**

Provide the values for **Network**, **Netmask**, and **Default Routers** from the information you gathered in Step 1c.

Note: The network address must be added in the Network box, not the host IP address of the WLC network management interface (i.e. not 192.168.200.254). Ask your lab supervisor for help if you get stuck on this.

- Click **Apply** to activate the configuration. Click **Save Configuration** in the upper-right-hand corner of the WLC interface to save your work so that it is available when the WLC restarts.

The internal DHCP server will now provide an address to LAP-1 after a brief delay. When LAP-1 has its IP address, the CAPWAP tunnel will be established and LAP-1 will be able to provide access to the Floor 2 Employees (SSID-5) WLAN. If you move the mouse over LAP-1 in the topology, you should see its IP address, the status of the CAPWAP tunnel, and the WLAN that LAP-1 is providing access to.

Part 4: Connect a Host to the WLAN

Step 1: Connect to the network and verify connectivity.

- Go to the desktop of **Wireless Host** and click the **PC Wireless** tile.
- Click the **Connect** tab. After a brief delay you should see the SSID for the WLAN appear in the table of wireless network names. Select the **SSID-5** network and click the **Connect** button.
- Enter the pre-shared key that you configured for the WLAN and click **Connect**.
- Click the **Link Information** tab. You should see a message that confirms that you have successfully connected to the access point. You should also see a wireless wave in the topology showing the connection to LAP-1.
- Click the **More Information** button to see details about the connection.

QUESTION 5: What is the current radio band is use?

QUESTION 6: Which wireless channel is currently in use for the connection (1-13)?

QUESTION 7: What network type is being used?

Before proceeding, return to the quiz on the Moodle page and enter your answers for questions 5-7. Leave the quiz open while you complete the rest of the lab sheet.

- f. Close the PC Wireless app and open the IP Configuration app. Verify that Wireless Host has received a non-APIPA IP address over DHCP. If not, click the Fast Forward Time button a few times.
- g. From Wireless Host, ping the WLAN default gateway and the Server to verify that the laptop has full connectivity.

If you have correctly configured all parts of the lab your activity score should now be showing as 100%. If so, click on “check results” in the activity window. Return to the Moodle quiz one last time and enter the code into the appropriate question box (Q8) of the quiz.

You have completed the lab – please submit the Moodle quiz.