Packet Tracer - Configure a Basic WLAN on the WLC



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# Addressing Table

Chart, diagram, box and whisker chart

Description automatically generated

| Device | Interface | IP Address |
| --- | --- | --- |
| R-1 | G/0/0 | 172.31.1.1/24 |
| R-1 | G0/0/1.5 | 192.168.5.1/24 |
| R-1 | G0/0/1.200 | 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 |

Blank Line, No additional information

# Objectives

In this lab, you will implement and configure a wireless LAN controller, explore some of its features. 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.

* Add a wireless LAN controller, lightweight access point and a wireless end device to the existing network.
* Connect to a wireless LAN controller GUI.
* Explain some of the information that is available on the WLC Monitor screen.
* 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 organization is centralizing 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 adding a new wireless network for the staff on the second floor and securing it with WPA-2 PSK security. To test the configuration, you will connect a laptop to the WLAN and ping devices on the network.

# Instructions

## Add and configure wireless devices to the existing network

### Add and configure the WLC.

* + - 1. Add the WLC 3504 model, connect to switch SW-1 on interface G1/0/23.

What is the port mode/type of interface G1/0/23 and G1/0/22?

Graphical user interface

Description automatically generatedBoth is UP state.

* + - 1. Configure device name and IP addressing for WLC under the Config tab.

Rename the device to **WLC-1** (important for the scoring of this task).

Configure IP address, subnet mask and default gateway on the management according to the Addressing table

What were the default setting on the management interface?

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.240

* + - 1. Configure initial setting for the WLC via the Wireless Controller GUI, accessible from browser.

On the Admin PC, open the browser and connect to the WLC by putting in the IP address in the URL field (using the HTTP protocol for initial configuration, once this is done, all subsequent access is using the HTTPS protocol).

Set admin username as **admin**

Set admin password as **Cisco123**

1: Set up controller:

System name as WLC-1

Management IP Address (same as earlier)

Subnet mask

Default gateway

Management VLAN ID as 1

2: Create Your Wireless Networks

Create a temporary WLAN, to be remove later. You can set any network name and passphrase.

Click Next.

Click Apply. (Note: If the “Saving your configuration …” is taking a long time, you can just close the browser)

* + - 1. Access the WLC GUI again via browser on Admin PC using HTTPS protocol for other configurations.
      2. Configure Internal DHCP server. This is to dynamically assign IP addresses to LAPs (managed by this WLC). Under CONTROLLER tab, under Internal DHCP Server, configure the following:

DHCP Scope:

Click New

Scope name: Management Network

Click Apply. Then Click on newly created Management Network scope

Pool start address: 192.168.200.240

Pool end address: 192.168.200.250

Network: 192.168.200.0

Netmask: 255.255.255.0

Default router: 192.168.200.1

Status: enable

* + - 1. Next, create the controller interface, WLAN-5 interface, which is the VLAN interface that is to be used for user traffic (i.e. WiFi for Floor 2 Employees). Under CONTOLLER tab, click on Interfaces.

Should already have management and virtual

Create a new interface named WLAN-5 for floor 2 employee.

Click New.

Interface Name: WLAN-5

VLAN Id: 5

Click Apply. Then configure:

Port number: 1

IP addr 192.168.5.254

Netmask 255.255.255.0

Gateway 192.168.5.1

Primary DHCP Server: 192.168.5.1 and global

Click Apply.

* + - 1. Remove the temporary wireless LAN, created earlier.

Under the WLANs tab, you should see the temporary WLAN created with WLAN ID = 1, delete it by clicking on “remove” at the end of the row. You will later configure the actual WLAN for the Floor 2 Employee in Part 3.

### Add and configure the LAP.

* + - 1. Add the LAP 3702i model, connect to switch SW-1 on port G1/0/22.

Start up the LAP.

Rename to **LAP-1**.

Configure the interface G0 to use DHCP.

* + - 1. Verify that LAP-1 has obtained an IP address from the WLC.

What is IP address obtained by LAP-1?

IP address: 192.168.200.240

Subnet Mask: 255.255.255.0

Gateway: 192.168.200.1

### Add and configure a wireless host.

* + - 1. Lastly, add a laptop and rename it to **Wireless Host**, which will later connect to the newly set up wireless LAN.
      2. You will need to replace the wired NIC with a wireless NIC.

## 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.

* + - 1. 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.
      2. 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 initial dashboard that has been demonstrated in this module.

* + - 1. Scroll through the Monitor Summary screen.

What can be learned from this screen?

The WLC's operational information, information about known access points and connected clients, and the access points and clients identified on the network.

Is the WLC connected to an AP?

Graphical user interface, text, application

Description automatically generatedYes,

Type your answers here.

* + - 1. Click Detail next to the All APs entry in the Access Point Summary section of the page. What information can you find about APs on the All APs screen?
      2. Detail for LAP-1

Type your answers here.

## 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.

### Create and enable the WLAN.

* + - 1. Click **WLANs** in the WLC menu bar. Locate the dropdown box in the upper right had corner of the WLANs screen. It will say **Create New**. Click **Go** to create a new WLAN.
      2. 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.
      3. Select the **ID** for the WLAN. This value is a label that will be used to identify the WLAN is 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.
      4. Click **Apply** so that the settings go into effect.
      5. 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.
      6. 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 **WLAN-5** interface. This interface was previously configured on the WLC for this activity.
      7. Click the **Advanced** tab.
      8. Scroll down to the FlexConnect portion of the page. Click to enable **FlexConnect Local Switching** and **FlexConnect Local Auth**.
      9. Click **Apply** to enable the new WLAN. If you forget to do this, the WLAN will not operate.

### 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.

What is WPA-PSK?

WPA-PSK stands for Wi-Fi Protected Access Pre-Shared Key. WPA is a data encryption specification for a wireless LAN and PSK is designed for usage in home and small business networks where each user shares the same passphrase.

Compare WPA2-PSK and WPA2-Enterprise.

WPA2-Enterprise offer authentication that is very secure specially designed for organizations compared to WPA2-PSK which is less secure designed for home use.

* + - 1. 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.
      2. Click the checkbox next to **WPA2 Policy**. This will reveal additional security settings. Under **Authentication Key Management**, enable **PSK**.
      3. Now you can enter the pre-shared key that will be used by hosts to join the WLAN. Use **Cisco123** as the passphrase.
      4. 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 activity to simplify configuration.

Briefly describe how to configure the WLAN to use WPA2-Enterprise instead of WPA2\_PSK.

Setup the WLAN to use WPA2-Enterprise instead of PSK for Authentication Key Management by enabling 802.1X instead of PSK.

### Verify the Settings

* + - 1. After Applying the configuration, click **Back**. This will take you back to the WLANs screen.

#### Question:

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

The information about the WLAN name, SSID, security policy, and admin status. The Admin Status value shows whether the WLAN is active or not.



Type your answers here.

* + - 1. 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.

## Connect a Host to the WLAN

### Connect to the network and verify connectivity.

* + - 1. Go to the desktop of **Wireless Host** and click the **PC Wireless** tile.
      2. 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.
      3. Enter the pre-shared key that you configured for the WLAN and click **Connect**.
      4. 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.
      5. Click the **More Information** button to see details about the connection.
      6. 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.
      7. From Wireless Host, ping the WLAN default gateway and the Server to verify that the laptop has full connectivity.

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