

Packet Tracer - Wireless Technology Exploration- Physical Mode

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
Corporate Office				
Corporate Router	G1/0	192.168.1.1	255.255.255.0	N/A
	G2/0	192.168.4.1	255.255.255.252	
	G3/0	192.168.3.1	255.255.255.252	
Corporate Server	Fa0	192.168.1.10	255.255.255.0	192.168.1.1
Corporate WLC	G2	192.168.1.50	255.255.255.0	192.168.1.1
LAP-C1 to C6	G0	DHCP	N/A	N/A
Laptop	Fa0	DHCP	N/A	N/A
Branch Office				
Branch Router	G0/0	192.168.2.1	255.255.255.0	N/A
	G2/0	192.168.4.2	255.255.255.252	
Branch Server	Fa0	192.168.2.10	255.255.255.0	192.168.2.1
Branch WLC	G2	192.168.2.50	255.255.255.0	192.168.2.1
LAP-B1 to B6	G0	DHCP	N/A	192.168.2.1
Central Office (CO)				
CO Server	N/A	192.168.5.2	255.255.255.252	192.168.5.1
Cellular	N/A	172.16.1.1	255.255.255.0	N/A
CO Router	G0/0	192.168.5.1	255.255.255.252	N/A
	G1/0	192.168.6.1	255.255.255.252	
	G3/0	192.168.3.2	255.255.255.252	
Cell Towers 0-5	Coaxial 0-2, 4-5	N/A	N/A	N/A

Objectives

Part 1: Explore the Wireless Network

Part 2: Add Wi-Fi Connectivity to a Boardroom

Part 3: Add Wireless Connectivity to a Coffee Shop in a Cellular Dead Zone

Part 4: Add Wireless Connectivity to a Home Office

Background / Scenario

XYZ Corporation is expanding their network capabilities to allow enhanced connectivity at their local offices, as well as connectivity for those wishing to work remotely. In this Packet Tracer Physical Mode (PTPM) activity, you have been asked to assist with this plan by reviewing the current network capabilities and adding wireless functionality as required.

Note: This activity is not graded. Your connectivity tests can be used to validate your physical connections and configurations.

Instructions

Part 1: Explore the Wireless Network

In Part 1, you will explore the wireless network and verify connectivity.

Note: Wireless and cellular signal representations are **on** in this activity. However, you can turn them off by clicking **View Wireless Signals** (Ctrl+Shift+W) on the top blue toolbar.

Step 1: Explore the topology.

- a. In **Physical** mode, you will notice that **Home City** contains five different locations: a **Corporate Office**, a **Branch Office**, a **Central Office (CO)**, a **Home Office**, and a **Coffee Shop**.

How are the four offices connected and what type of cables connect them?

The Corporate Office is connected to the Branch and Central office via fiber. The home office is not connected

- b. Navigate inside the **Corporate Office**. Notice that six Lightweight Wireless Access Points (LWAPs) are connected to the wiring closet.

How are the LWAPs connected to the network?

The LWAPs are connected to the WLAN controller through the switch using copper cables

- c. Navigate into the CO wiring closet.

How are the cell towers connected to the **Central Office Server**?

The cell towers are connected to the Central Office Server through coaxial cables

- d. Navigate to the **Branch Office**. Notice that five LWAPs are connected via copper cable to the **Branch Switch** in the wiring closet. The switch is then connected to the **Branch WLC** (wireless LAN controller).

Step 2: Verify connectivity.

- a. To verify connectivity, navigate to **Corporate Office > Corporate Office Wiring Closet**.
- b. Click the laptop, and then **Desktop** tab > **Command Prompt**.
 - 1) Ping 192.168.2.10 (the **Branch Office Server**).
 - 2) Ping 192.168.5.2 (the **Central Office** backbone connection).

Note: Packet Tracer can take some time to converge. You may receive **Request time out** messages. However, both of the pings should eventually be successful. At the bottom of the Packet Tracer interface, click **Fast Forward Time** several times to speed up convergence.

- c. Navigate to the **Home City**. Click the **Smartphone** next to the cell tower above the **Central Office** building.
- d. Click **Desktop** tab, and then **Command Prompt**.
 - 1) Ping 172.16.1.1 (the cellular connection at the **Central Office**).
 - 2) Ping 192.168.1.10 (the **Corporate Office Server**).

You may receive one or two **Request time out** messages. However, both of the pings should be successful.

What are the different physical connections used between **Smartphone1** and the **Corporate Office Server**?

The Smartphone to Cell Tower connection is cellular. The Cell Tower to CO connection uses a coaxial cable. The CO to the Corporate Office uses fiber.

Part 2: Add Wi-Fi Connectivity to a Boardroom

A new boardroom is being created within the **Branch Office**. Currently the boardroom is in a Wi-Fi dead zone. In Part 2, your task is to provide connectivity for devices within that room.

Step 1: Install a new LAP-PT device to provide coverage for the new boardroom.

- Navigate to the **Branch Office**. The laptop inside the new boardroom has no access to a Wi-Fi signal.
- Click and drag the access point on the **Inventory Shelf** to the **Boardroom**.
- Click the new access point to open it. From the **Modules** menu, click and drag an **ACCESS_POINT_POWER_ADAPTER** and connect it to the power port next to the **Reset** button.
- Click the **Config** tab. Under **GLOBAL Settings** name the device **LAP-B6**.
- Under **INTERFACE Dot11Radio0** set the **Coverage Range** to **75.00** meters. Packet Tracer does not grade this setting.
- Close the window for **LAP-B6**. If you have **View Wireless Signals** on, you will notice that there is now coverage in the boardroom.
- From the **Bottom Toolbar**, click **Connections > Copper Straight-Through** cable.
- Connect one end of the cable to the **GigabitEthernet0** interface on the new access point. Click the rack of equipment and connect the other end of the cable to the **Rack > Branch Switch > Fa0/22 interface**.

Step 2: Verify Connectivity.

- In the boardroom, click the laptop, and then **Desktop** tab > **IP Configuration**. The laptop should now have full IPv4 configuration under **IP Configuration**. However, the DHCP processes may take a few minutes to complete. If necessary, toggle between DHCP and Static to resend a DHCP request. You may also need to click **Fast Forward Time** several times to speed up convergence.
- When the IP addressing is provided, you can verify connectivity. Close the **IP Configuration** window, and then click **Command Prompt**.
 - Ping 192.168.2.1 (the **default gateway**).
 - Ping 192.168.1.10 (the **Corporate Server**).

Part 3: Add Wireless Connectivity to a Coffee Shop in a Cellular Dead Zone

A new **Coffee Shop** has opened in the **Home City**, but there is currently no cellular service in this area. Your task is to provide cellular service for customers and employees of the coffee shop.

Step 1: Connect a new cell tower.

- Navigate to the **Home City**.
- Notice that the **Cell Tower** next to the **Coffee Shop** is not connected to the **Central Office**.
- From the Bottom Toolbar, click **Connections > Coaxial** cable.
- Connect one end to the **Coaxial0** interface on the unconnected Cell Tower. Then click **Central Office > Central Office Wiring Closet > Table > Central Office Server > Coaxial0/3 interface**.

Step 2: Tether a laptop to the smartphone.

- a. A remote worker wants to work at the coffee shop. Navigate to the **Coffee Shop** and locate the smartphone and laptop on the table.
- b. Click **Smartphone > Config** tab > **3G/4G Cell1** to verify that the smartphone has received an IP address. It may take a few seconds to get addressing information. Click **DHCP Refresh**, if necessary.
- c. Click **Settings** and verify the smartphone has received a default gateway and DNS server address.
- d. Under **Cellular Tethering**, enable Bluetooth.
- e. Under **INTERFACE**, click **Bluetooth**, and set **Port Status** to **On**. Verify that **Discoverable** is enabled.
- f. In the Coffee Shop, click Laptop > Desktop tab > Bluetooth, and set Port Status to On.
- g. Select **Discover** to display **Smartphone1** under discoverable devices.
- h. Select the **Smartphone1**, click **Pair**, and then answer **Yes** to the **Bluetooth Pairing** popup message.
- i. Click the laptop again, reselect the **Smartphone1**, and then click **Tether**. It may be necessary to move the smartphone and laptop close together for Bluetooth pairing to work.
- j. After a few seconds, you should see valid addressing information in the **IP Configuration** section. If not, repeat the previous steps.
- k. To verify connectivity, close the **Bluetooth Configuration** window, and then click **Command Prompt**. Ping the **cellular gateway** (172.16.1.1) and the **Corporate Office Server** (192.168.1.10). If the first ping to the **Corporate Office Server** is not successful, try another ping.

Part 4: Add Wireless Connectivity to a Home Office

A remote worker for XYZ Corporation has just moved and the new house does not have a network setup yet. Your task is to set up a network to provide wireless access throughout the house and connectivity to the Corporate Office.

Step 1: Select and cable the devices.

- a. Navigate to the **Home City**, and then **Home Office**.
On the shelf behind the desk chair, there is a wireless router with external antennae. There is also a cable modem directly to the right of the wireless router. On the table in front of the couch, there is a laptop.
- b. Click **Connections > Copper Straight-Through**.
- c. Connect one end of the cable to **Port 1** of **Cable Modem**. Connect the other end to the **Internet** port on **Wireless Router**.
- d. Navigate to the **Home City** view.
- e. From the **Bottom Toolbar**, click **Connections > Coaxial** cable.
- f. Click **Home Office > Cable Modem0 > Port 0**, and then click the **Central Office > Central Office Wiring Closet > Rack > CMTS > Coaxial7** port.

Step 2: Configure the wireless router.

- a. Navigate to the **Home Office**, and click **Wireless Router > GUI** tab.
- b. The **Setup** tab is already selected. For **Internet Connection Type**, verify **Automatic Configuration - DHCP** is selected.
- c. Under **Network Setup**, verify that the following information is configured:
IP Address: **192.168.0.1**
Subnet Mask: **255.255.255.0**

DHCP: **Enabled**

Starting IP Address: **192.168.0.100**

Maximum number of users: **50**

- d. Scroll back to the top and click the **Status** tab. Under **Internet Connection**, the wireless router should have DHCP addressing from the **Central Office**. If not, click **IP Address Renew** to resend DHCP messages.
- e. Click the **Wireless** tab.
- f. Configure the 2.4 GHz network with **homesweethome** as the **Network Name (SSID)**. Scroll to the bottom and click **Save Settings**.
- g. Scroll back to the top and select the **Wireless Security** subtab.
- h. For the 2.4 GHz **Security Mode**, select **WPA2-Personal**, and then configure **mySecureNet** as the **Passphrase**. Scroll to the bottom and click **Save Settings**.

Step 3: Verify connectivity.

- a. On the table in front of the couch, click the laptop, and then the **Config** tab. Next, select **Wireless0** under **INTERFACE**.
- b. Enter the SSID **homesweethome**.
- c. Select **WPA2-PSK** for the **Authentication** method, and then configure **mySecureNet** as the **PSK Pass Phrase**.
- d. Under **IP Configuration**, the laptop should receive DHCP addressing. You may need to toggle between DHCP and Static a few times to resend DHCP requests.
- e. Click **Desktop** tab > **Command Prompt**. Ping various addresses throughout the network. For example, the following pings should be successful:
ping 192.168.6.1 (**Central Office router G1/0**)
ping 192.168.1.10 (**Corporate Office Server**)
ping 192.168.2.10 (**Branch Office Server**)

Reflection

1. What overall benefit does wireless technology provide to the end user?
Wireless technology allows users to access network resources without being constrained by physical cabling
2. Which form of wireless networking is the most beneficial?
Cellular is the most beneficial wireless technology because it allows users to access resources essentially anywhere.
3. How could each of the following groups benefit from the various wireless technologies presented in this activity?
 - Student Cellular allows students to access the internet essentially anywhere
 - Salesperson Cellular allows a salesperson to access remote documents on the go
 - R&D Engineer Wi-Fi allows engineers to access resources within the office without being tied to a desk
 - Corporate Executive Wi-Fi allows executives to access resources anywhere within the office without having to plug in a cable