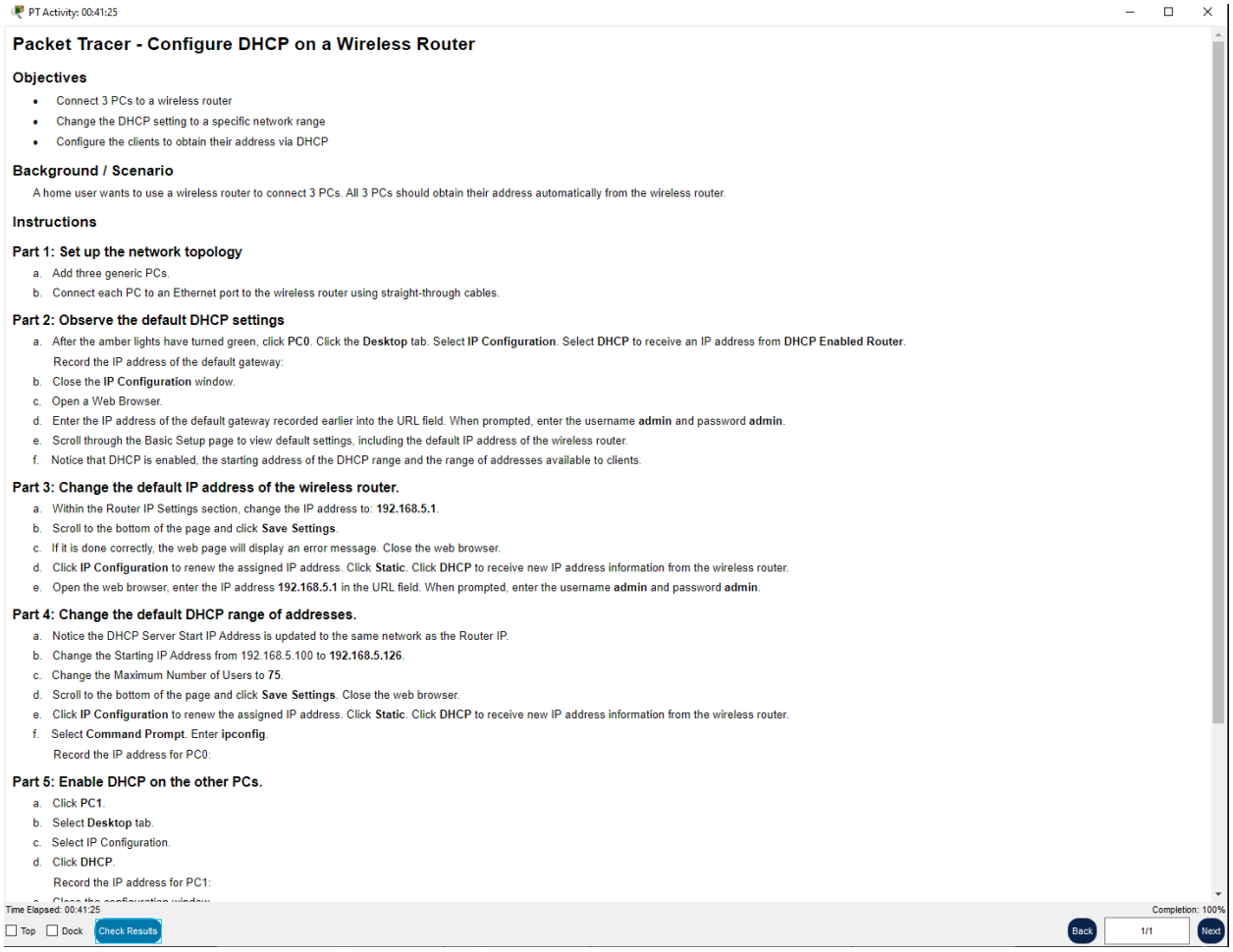
Networking Basics

11.2.3



PT Activity: 00:41:25

Packet Tracer - Configure DHCP on a Wireless Router

Objectives

- Connect 3 PCs to a wireless router
- Change the DHCP setting to a specific network range
- Configure the clients to obtain their address via DHCP

Background / Scenario

A home user wants to use a wireless router to connect 3 PCs. All 3 PCs should obtain their address automatically from the wireless router.

Instructions

Part 1: Set up the network topology

a. Add three generic PCs.
b. Connect each PC to an Ethernet port to the wireless router using straight-through cables.

Part 2: Observe the default DHCP settings

a. After the amber lights have turned green, click **PC0**. Click the **Desktop** tab. Select **IP Configuration**. Select **DHCP** to receive an IP address from **DHCP Enabled Router**.
Record the IP address of the default gateway:
b. Close the **IP Configuration** window.
c. Open a Web Browser.
d. Enter the IP address of the default gateway recorded earlier into the URL field. When prompted, enter the username **admin** and password **admin**.
e. Scroll through the Basic Setup page to view default settings, including the default IP address of the wireless router.
f. Notice that DHCP is enabled, the starting address of the DHCP range and the range of addresses available to clients.

Part 3: Change the default IP address of the wireless router.

a. Within the Router IP Settings section, change the IP address to: **192.168.5.1**.
b. Scroll to the bottom of the page and click **Save Settings**.
c. If it is done correctly, the web page will display an error message. Close the web browser.
d. Click **IP Configuration** to renew the assigned IP address. Click **Static**. Click **DHCP** to receive new IP address information from the wireless router.
e. Open the web browser, enter the IP address **192.168.5.1** in the URL field. When prompted, enter the username **admin** and password **admin**.

Part 4: Change the default DHCP range of addresses.

a. Notice the DHCP Server Start IP Address is updated to the same network as the Router IP.
b. Change the Starting IP Address from 192.168.5.100 to **192.168.5.126**.
c. Change the Maximum Number of Users to **75**.
d. Scroll to the bottom of the page and click **Save Settings**. Close the web browser.
e. Click **IP Configuration** to renew the assigned IP address. Click **Static**. Click **DHCP** to receive new IP address information from the wireless router.
f. Select **Command Prompt**. Enter **ipconfig**.
Record the IP address for PC0:

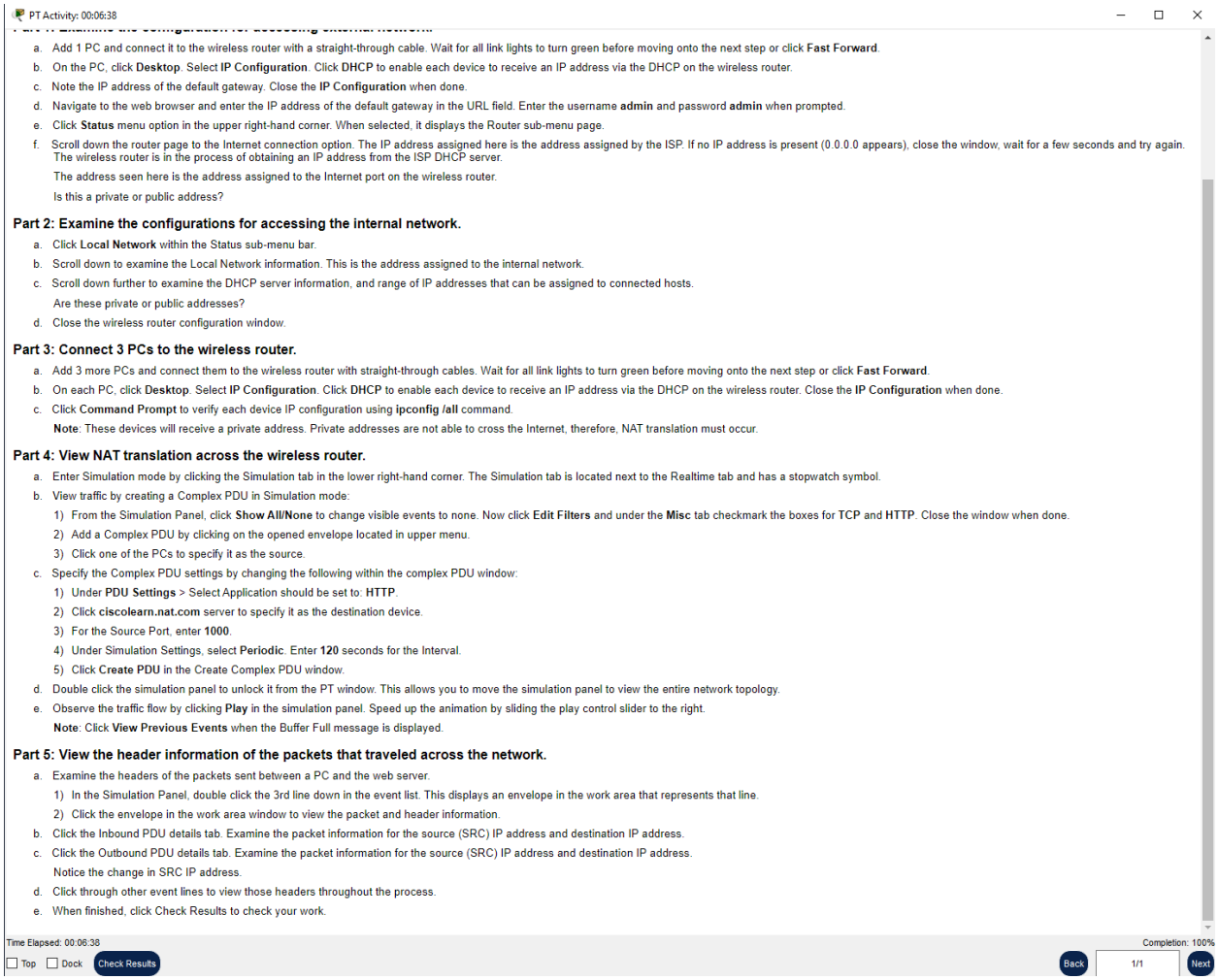
Part 5: Enable DHCP on the other PCs.

a. Click **PC1**.
b. Select **Desktop** tab.
c. Select IP Configuration.
d. Click **DHCP**.
Record the IP address for PC1:

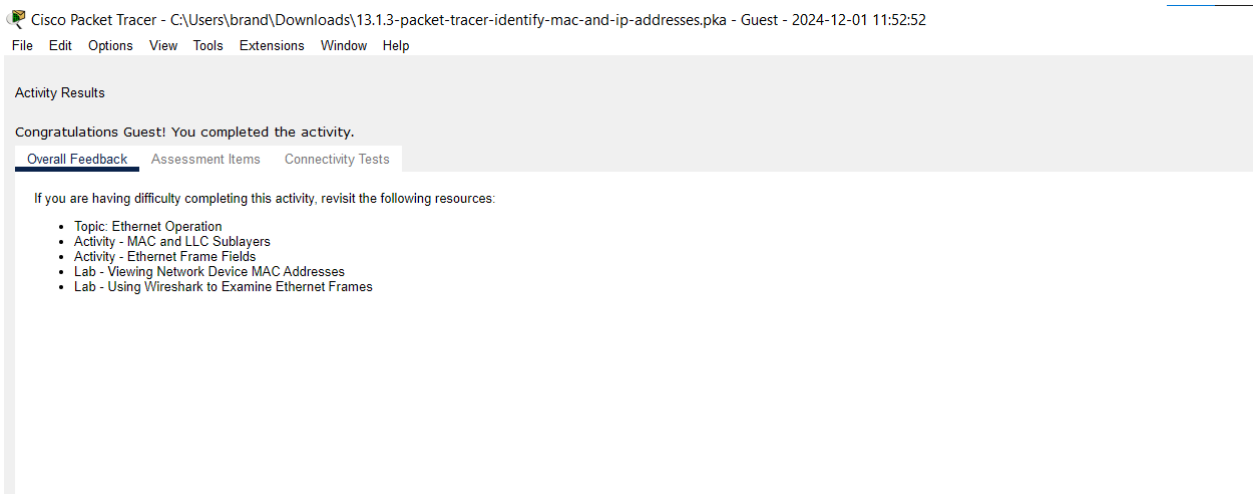
Time Elapsed: 00:41:25 Completion: 100%

Top Dock Check Results Back 1/1 Next

12.2.2

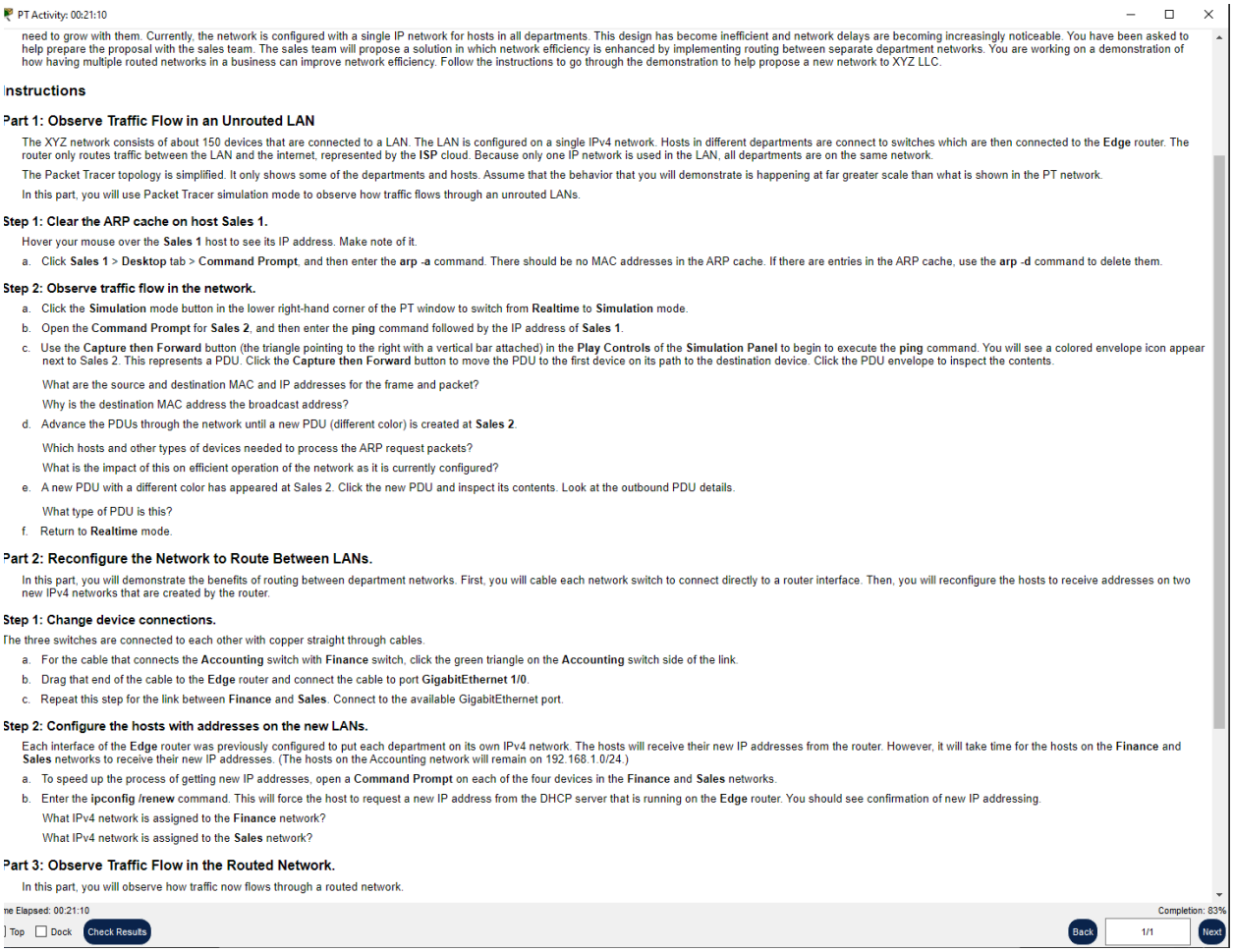

PT Activity: 00:06:38
a. Add 1 PC and connect it to the wireless router with a straight-through cable. Wait for all link lights to turn green before moving onto the next step or click Fast Forward.
b. On the PC, click Desktop. Select IP Configuration. Click DHCP to enable each device to receive an IP address via the DHCP on the wireless router.
c. Note the IP address of the default gateway. Close the IP Configuration when done.
d. Navigate to the web browser and enter the IP address of the default gateway in the URL field. Enter the username admin and password admin when prompted.
e. Click Status menu option in the upper right-hand corner. When selected, it displays the Router sub-menu page.
f. Scroll down the router page to the Internet connection option. The IP address assigned here is the address assigned by the ISP. If no IP address is present (0.0.0.0 appears), close the window, wait for a few seconds and try again. The wireless router is in the process of obtaining an IP address from the ISP DHCP server.
The address seen here is the address assigned to the Internet port on the wireless router.
Is this a private or public address?
Part 2: Examine the configurations for accessing the internal network.
a. Click Local Network within the Status sub-menu bar.
b. Scroll down to examine the Local Network information. This is the address assigned to the internal network.
c. Scroll down further to examine the DHCP server information, and range of IP addresses that can be assigned to connected hosts.
Are these private or public addresses?
d. Close the wireless router configuration window.
Part 3: Connect 3 PCs to the wireless router.
a. Add 3 more PCs and connect them to the wireless router with straight-through cables. Wait for all link lights to turn green before moving onto the next step or click Fast Forward.
b. On each PC, click Desktop. Select IP Configuration. Click DHCP to enable each device to receive an IP address via the DHCP on the wireless router. Close the IP Configuration when done.
c. Click Command Prompt to verify each device IP configuration using ipconfig /all command.
Note: These devices will receive a private address. Private addresses are not able to cross the Internet, therefore, NAT translation must occur.
Part 4: View NAT translation across the wireless router.
a. Enter Simulation mode by clicking the Simulation tab in the lower right-hand corner. The Simulation tab is located next to the Realtime tab and has a stopwatch symbol.
b. View traffic by creating a Complex PDU in Simulation mode:
1) From the Simulation Panel, click Show All/None to change visible events to none. Now click Edit Filters and under the Misc tab checkmark the boxes for TCP and HTTP. Close the window when done.
2) Add a Complex PDU by clicking on the opened envelope located in upper menu.
3) Click one of the PCs to specify it as the source.
c. Specify the Complex PDU settings by changing the following within the complex PDU window:
1) Under PDU Settings > Select Application should be set to: HTTP.
2) Click ciscolearn.nat.com server to specify it as the destination device.
3) For the Source Port, enter 1000.
4) Under Simulation Settings, select Periodic. Enter 120 seconds for the Interval.
5) Click Create PDU in the Create Complex PDU window.
d. Double click the simulation panel to unlock it from the PT window. This allows you to move the simulation panel to view the entire network topology.
e. Observe the traffic flow by clicking Play in the simulation panel. Speed up the animation by sliding the play control slider to the right.
Note: Click View Previous Events when the Buffer Full message is displayed.
Part 5: View the header information of the packets that traveled across the network.
a. Examine the headers of the packets sent between a PC and the web server.
1) In the Simulation Panel, double click the 3rd line down in the event list. This displays an envelope in the work area that represents that line.
2) Click the envelope in the work area window to view the packet and header information.
b. Click the Inbound PDU details tab. Examine the packet information for the source (SRC) IP address and destination IP address.
c. Click the Outbound PDU details tab. Examine the packet information for the source (SRC) IP address and destination IP address.
Notice the change in SRC IP address.
d. Click through other event lines to view those headers throughout the process.
e. When finished, click Check Results to check your work.
Time Elapsed: 00:06:38
Completion: 100%
Top
Dock
Check Results
Back
1/1
Next

13.1.3


Cisco Packet Tracer - C:\Users\brand\Downloads\13.1.3-packet-tracer-identify-mac-and-ip-addresses.pka - Guest - 2024-12-01 11:52:52
File Edit Options View Tools Extensions Window Help
Activity Results
Congratulations Guest! You completed the activity.
Overall Feedback
Assessment Items
Connectivity Tests
If you are having difficulty completing this activity, revisit the following resources:
Topic: Ethernet Operation
Activity - MAC and LLC Sublayers
Activity - Ethernet Frame Fields
Lab - Viewing Network Device MAC Addresses
Lab - Using Wireshark to Examine Ethernet Frames

14.3.3

I should have gotten 100% because I renewed the IP for all the computers.

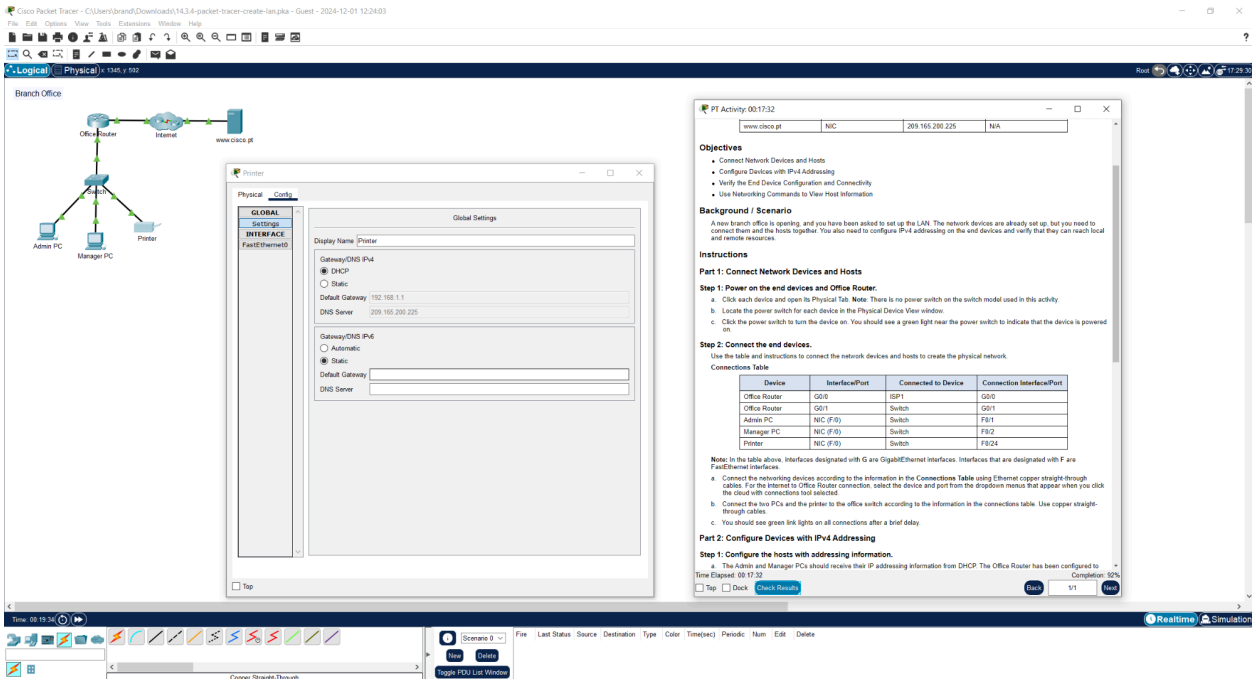


Assessment Items	Status	Points	Component(s)	Feedback
Network				
Finance		0	Other	
Ports		0	Other	
GigabitEthernet4/1		0	Other	
Link to Edge		0	Other	
Connects to GigabitEthernet1/0	Correct	1	Physical	
Finance 1		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
IP Address	Correct	1	Ip	
Finance 2		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
IP Address	Incorrect	1	Ip	Be sure to renew the IP address Finance 2.
Sales		0	Other	
Ports		0	Other	
GigabitEthernet4/1		0	Other	
Link to Edge		0	Other	
Connects to GigabitEthernet2/0	Correct	1	Physical	
Sales 1		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
IP Address	Correct	1	Ip	
Sales 2		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
IP Address	Correct	1	Ip	

I renewed the IP for Finance 2

14.3.4

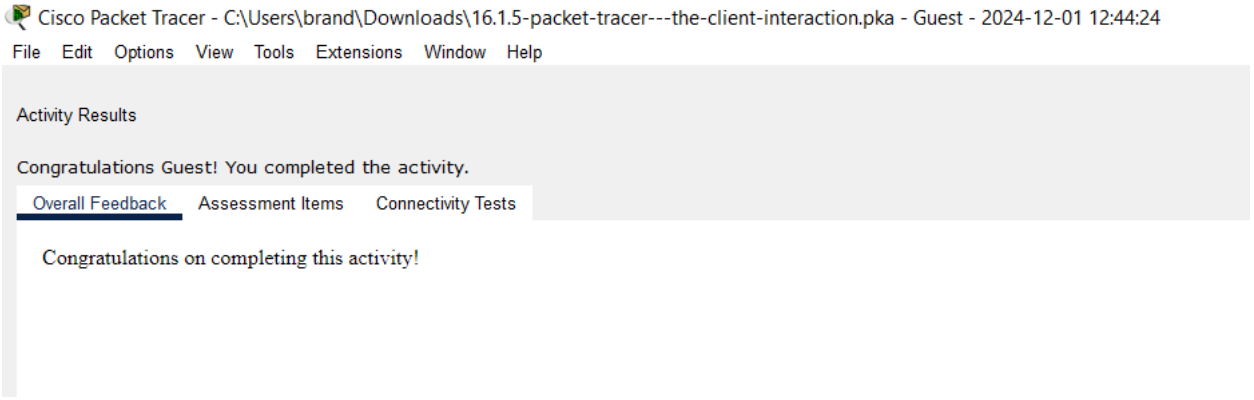
I should have 100% for this because the IP address for the printer is correct



Expand/Collapse All | Show Incorrect Items

Assessment Items	Status	Points	Component(s)	Feedback
Network				
Admin PC				
Ports				
FastEthernet0				
DHCP client enable	Correct	1	Dynamic Addressing	
Link to Switch		0	Other	
Connects to FastEthernet0/1	Correct	1	Cabling	
Power	Correct	1	Power	
Manager PC				
Ports				
FastEthernet0				
DHCP client enable	Correct	1	Dynamic Addressing	
Link to Switch		0	Other	
Connects to FastEthernet0/2	Correct	1	Cabling	
Power	Correct	1	Power	
Office Router				
Ports		0	Other	
GigabitEthernet0/0		0	Other	
Link to ISP1		0	Other	
Connects to GigabitEthernet0/0	Correct	1	Physical	
Power	Correct	1	Power	
Printer				
Ports				
FastEthernet0				
IP Address	Incorrect	1	IPv4 Addressing	Configure the printer with the IP address from the Addressing Table.
Link to Switch		0	Other	
Connects to FastEthernet0/24	Correct	1	Cabling	
Subnet Mask	Correct	1	IPv4 Addressing	
Power	Correct	1	Power	
Switch		0	Other	
Ports		0	Other	
GigabitEthernet0/1		0	Other	
Link to Office Router		0	Other	
Connects to GigabitEthernet0/1	Correct	1	Cabling	

16.1.5



16.4.3

Cisco Packet Tracer - C:\Users\brand\Downloads\16.4.3-packet-tracer---observe-web-request.pka - Guest - 2024-12-01 12:49:17

File Edit Options View Tools Extensions Window Help

Activity Results

Congratulations Guest! You completed the activity.

Overall Feedback | Assessment Items | Connectivity Tests

Congratulations on completing this activity!

16.5.3

PT Activity: 00:04:53

Packet Tracer - Use FTP Services

Addressing Table

Device	Interface	IP Address	Subnet Mask
FTP Server (ftp.pka)	NIC	209.165.200.226	255.255.255.224

Objectives

- Upload a file to an FTP server.
- Download a file from an FTP server.

Background / Scenario

File Transfer Protocol (FTP) is a commonly used application to transfer files between clients and servers on the network. The server is configured to run the service where clients connect, login, and transfer files. FTP uses port 21 as the server command port to create the connection. FTP then uses port 20 for data transfer.

In this activity, you will upload a file to an FTP server. You will also download a file from an FTP server.

Instructions

Part 1: Upload a file to an FTP server.

In this part, you will locate the file **sampleFile.txt** and upload it to an FTP server.

Step 1: Locate the file.

a. Click **PC-A**.

b. Click **Desktop**.

c. Click **Command Prompt**.

d. At the prompt, click **?** to list the available commands.

e. Enter **dir** to see the files on the PC. Notice that there is a **sampleFile.txt** file in the C:\ directory.

```
C:\> dir
Volume in drive C has no label.
Volume Serial Number is 5E12-4AF3
Directory of C:\

12/31/1969 17:0 PM 26 sampleFile.txt
26 bytes 1 File(s)
```

Step 2: Connect to the FTP server.

a. FTP to the FTP server at **209.165.200.226** or **ftp.pka**.

```
C:\> ftp 209.165.200.226
Trying to connect...209.165.200.226
Connected to 209.165.200.226
```

b. Enter the username **student** and password **class** to gain access.

```
220- Welcome to PT Ftp server
Username:student
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
```

Step 3: Upload a file to an FTP server.

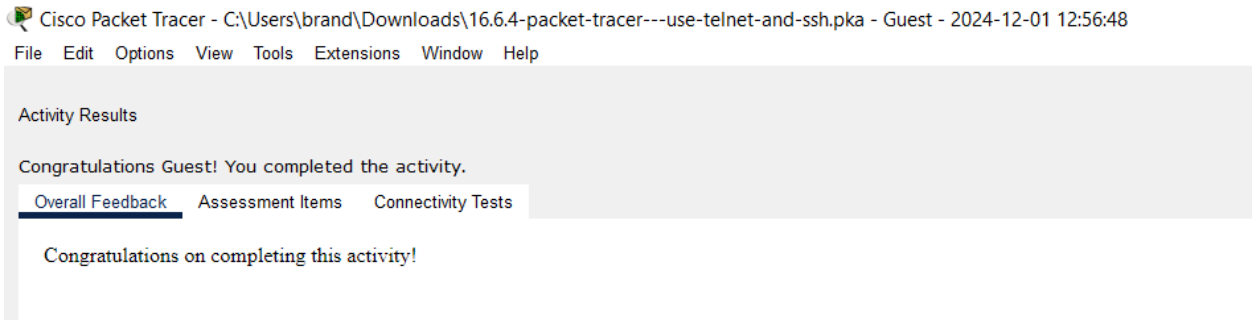
a. Enter **?** to see the commands available in the ftp client.

```
ftp> ?
?
cd
delete
dir
```

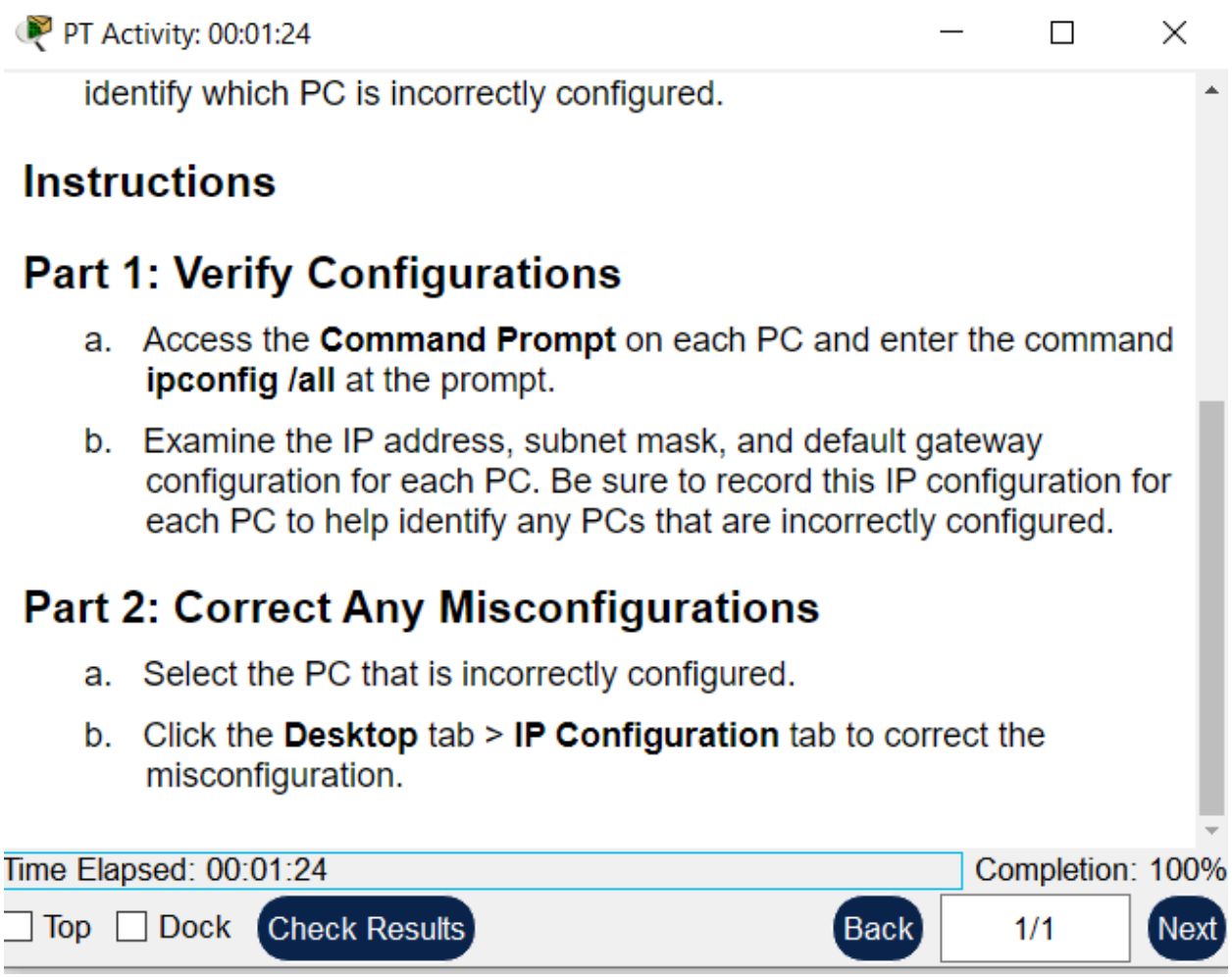
Time Elapsed: 00:04:53 Completion: 100%

Top Dock Check Results Back 1/1 Next

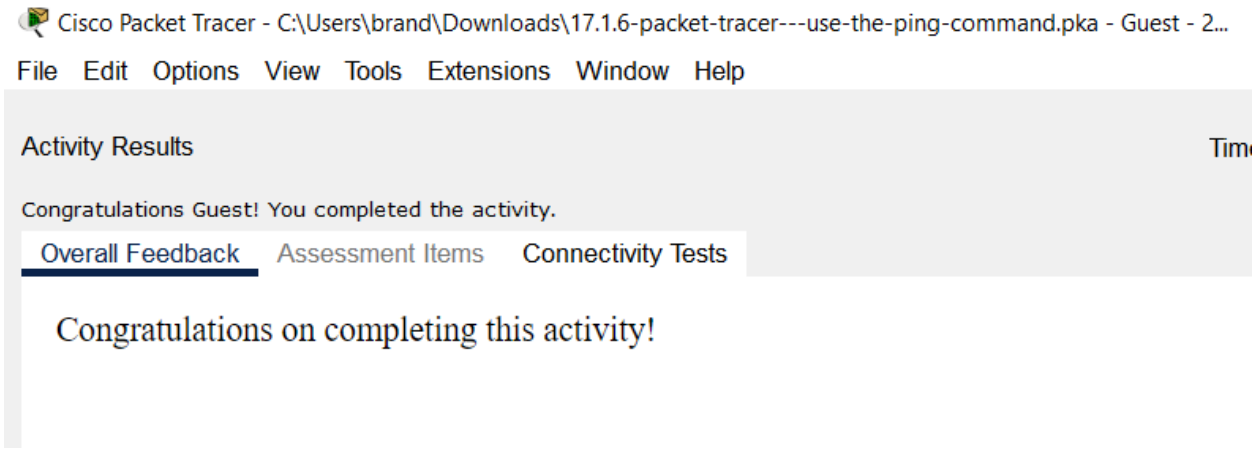
16.6.4


Cisco Packet Tracer - C:\Users\brand\Downloads\16.6.4-packet-tracer---use-telnet-and-ssh.pka - Guest - 2024-12-01 12:56:48
File Edit Options View Tools Extensions Window Help
Activity Results
Congratulations Guest! You completed the activity.
Overall Feedback
Assessment Items
Connectivity Tests
Congratulations on completing this activity!

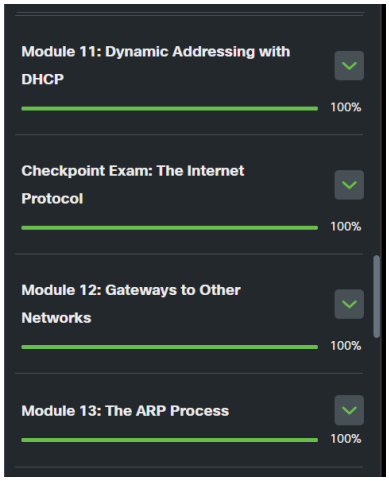
17.1.3

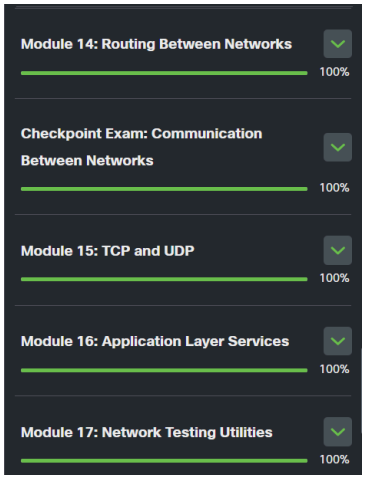

PT Activity: 00:01:24
identify which PC is incorrectly configured.
Instructions
Part 1: Verify Configurations
a. Access the Command Prompt on each PC and enter the command ipconfig /all at the prompt.
b. Examine the IP address, subnet mask, and default gateway configuration for each PC. Be sure to record this IP configuration for each PC to help identify any PCs that are incorrectly configured.
Part 2: Correct Any Misconfigurations
a. Select the PC that is incorrectly configured.
b. Click the Desktop tab > IP Configuration tab to correct the misconfiguration.
Time Elapsed: 00:01:24
Completion: 100%
Top
Dock
Check Results
Back
1/1
Next

17.1.6

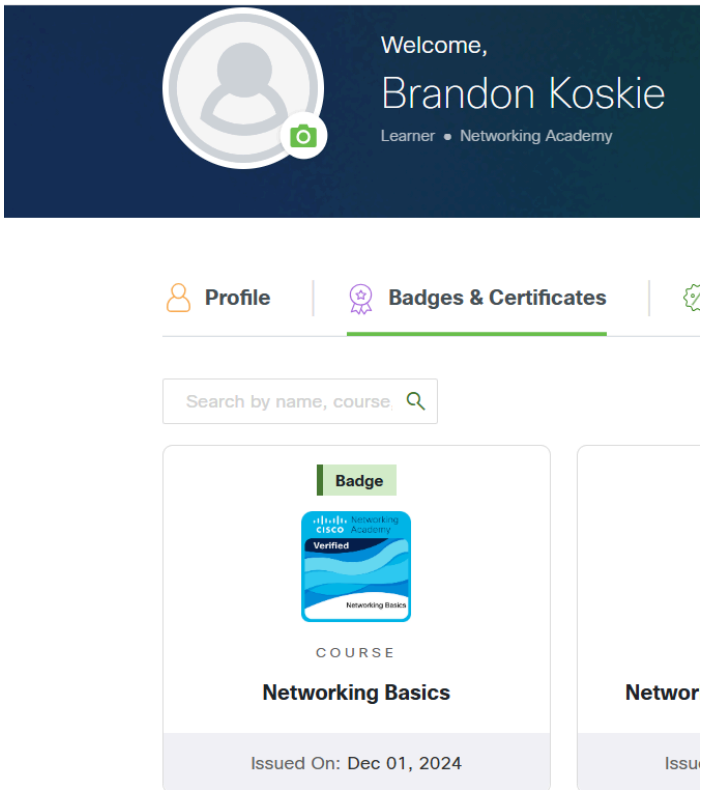


Networking Basics Modules 11-17



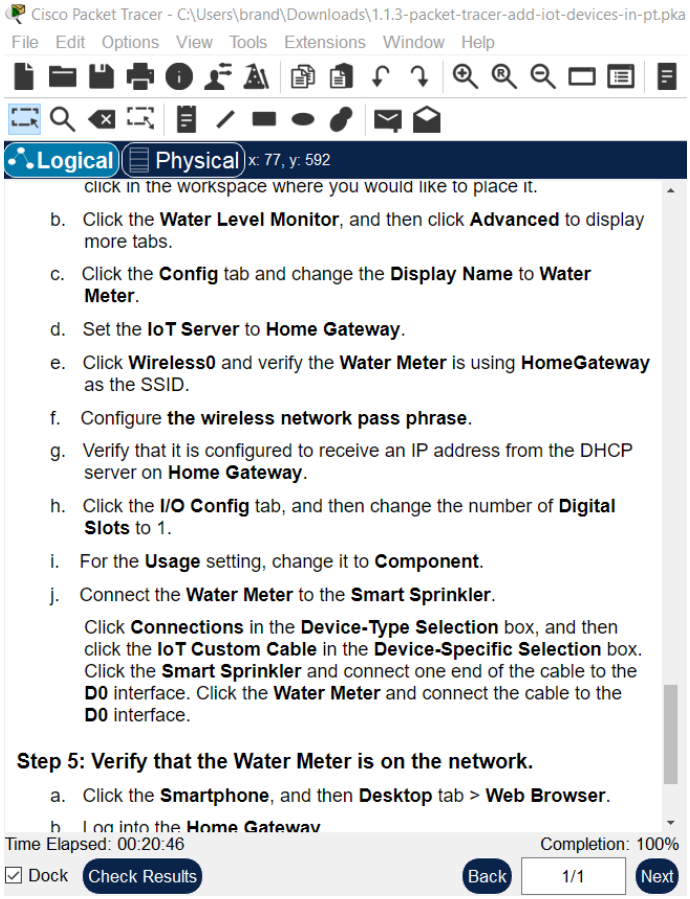


Networking Basics Certification

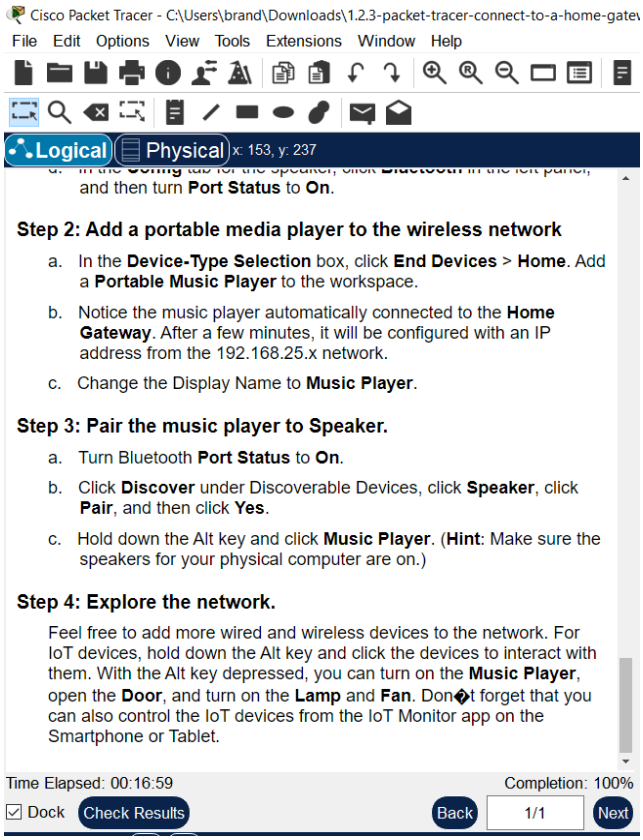


Exploring Internet of Things with Cisco Packet Tracer

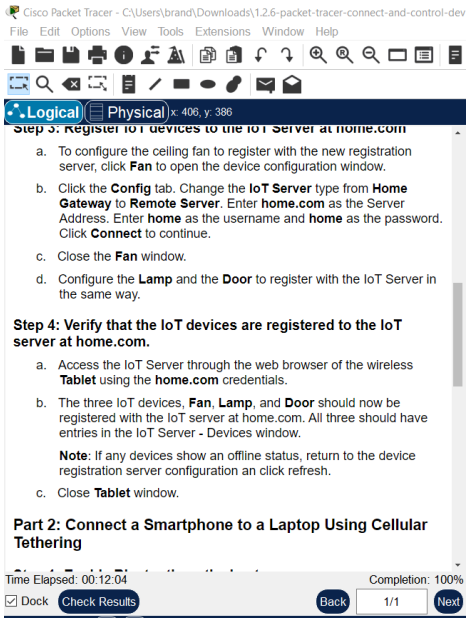
1.1.3



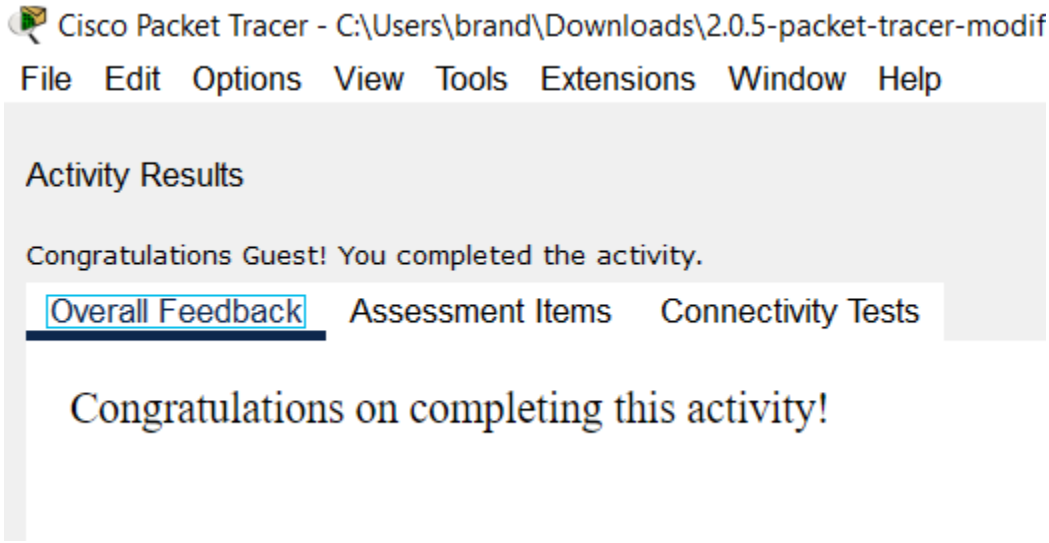
1.2.3


Cisco Packet Tracer - C:\Users\brand\Downloads\1.2.3-packet-tracer-connect-to-a-home-gatev
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 153, y: 237
and then turn Port Status to On.
Step 2: Add a portable media player to the wireless network
a. In the Device-Type Selection box, click End Devices > Home. Add a Portable Music Player to the workspace.
b. Notice the music player automatically connected to the Home Gateway. After a few minutes, it will be configured with an IP address from the 192.168.25.x network.
c. Change the Display Name to Music Player.
Step 3: Pair the music player to Speaker.
a. Turn Bluetooth Port Status to On.
b. Click Discover under Discoverable Devices, click Speaker, click Pair, and then click Yes.
c. Hold down the Alt key and click Music Player. (Hint: Make sure the speakers for your physical computer are on.)
Step 4: Explore the network.
Feel free to add more wired and wireless devices to the network. For IoT devices, hold down the Alt key and click the devices to interact with them. With the Alt key depressed, you can turn on the Music Player, open the Door, and turn on the Lamp and Fan. Don't forget that you can also control the IoT devices from the IoT Monitor app on the Smartphone or Tablet.
Time Elapsed: 00:16:59
Completion: 100%
Dock
Check Results
Back
1/1
Next

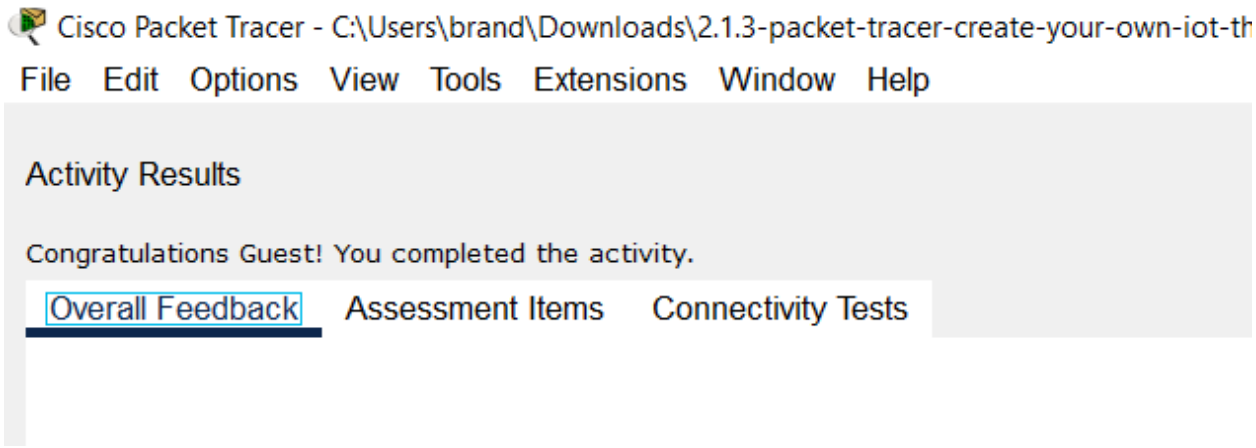
1.2.6


Cisco Packet Tracer - C:\Users\brand\Downloads\1.2.6-packet-tracer-connect-and-control-dev
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 406, y: 386
a. To configure the ceiling fan to register with the new registration server, click Fan to open the device configuration window.
b. Click the Config tab. Change the IoT Server type from Home Gateway to Remote Server. Enter home.com as the Server Address. Enter home as the username and home as the password. Click Connect to continue.
c. Close the Fan window.
d. Configure the Lamp and the Door to register with the IoT Server in the same way.
Step 4: Verify that the IoT devices are registered to the IoT server at home.com.
a. Access the IoT Server through the web browser of the wireless Tablet using the home.com credentials.
b. The three IoT devices, Fan, Lamp, and Door should now be registered with the IoT server at home.com. All three should have entries in the IoT Server - Devices window.
Note: If any devices show an offline status, return to the device registration server configuration an click refresh.
c. Close Tablet window.
Part 2: Connect a Smartphone to a Laptop Using Cellular Tethering
Time Elapsed: 00:12:04
Completion: 100%
Dock
Check Results
Back
1/1
Next

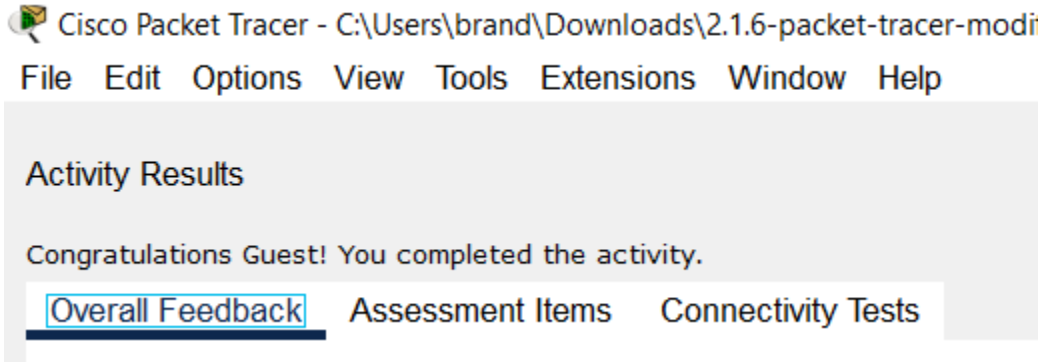
2.0.5


Cisco Packet Tracer - C:\Users\brand\Downloads\2.0.5-packet-tracer-modif
File Edit Options View Tools Extensions Window Help
Activity Results
Congratulations Guest! You completed the activity.
Overall Feedback
Assessment Items
Connectivity Tests
Congratulations on completing this activity!

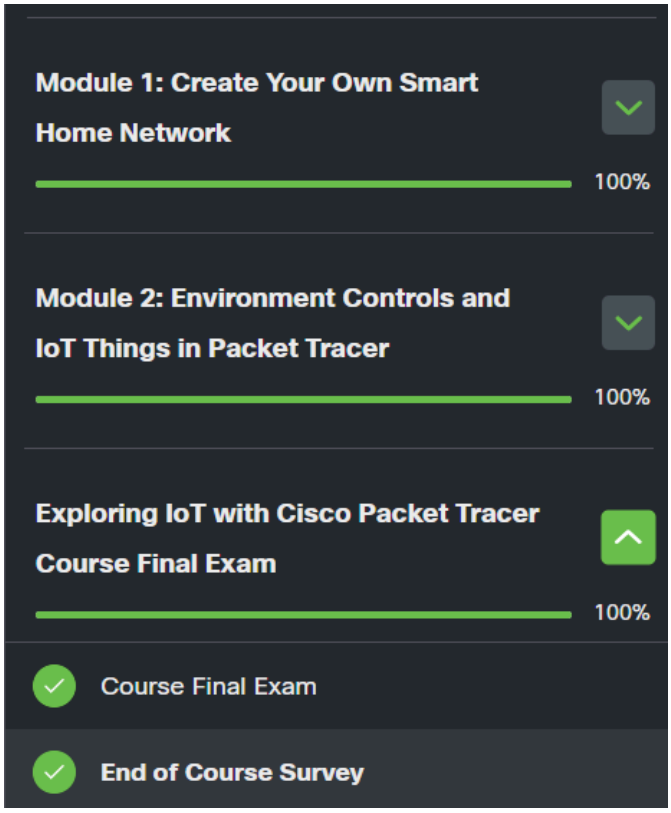
2.1.3



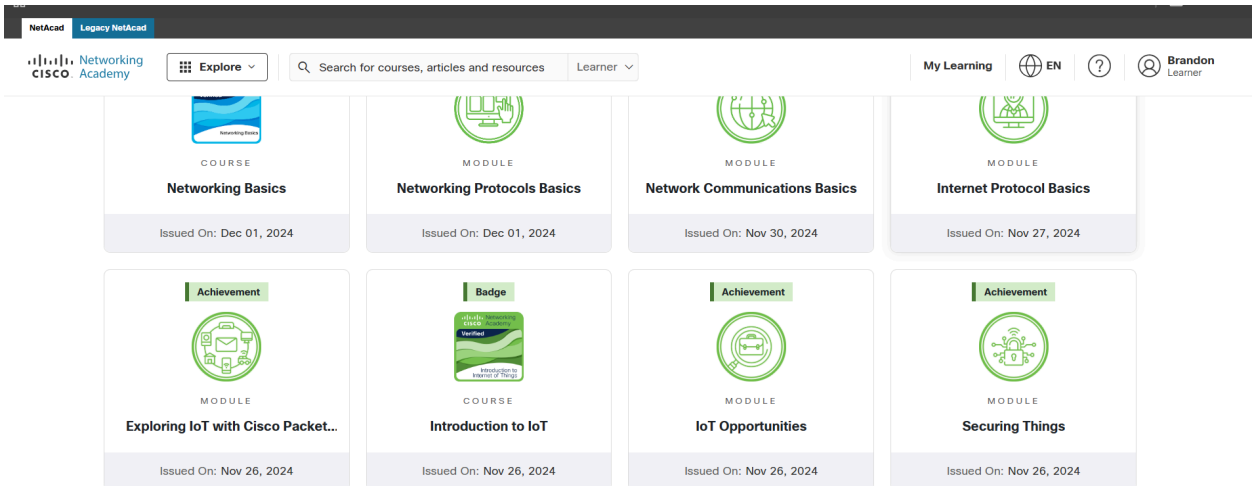
2.1.6



Exploring IoT Modules

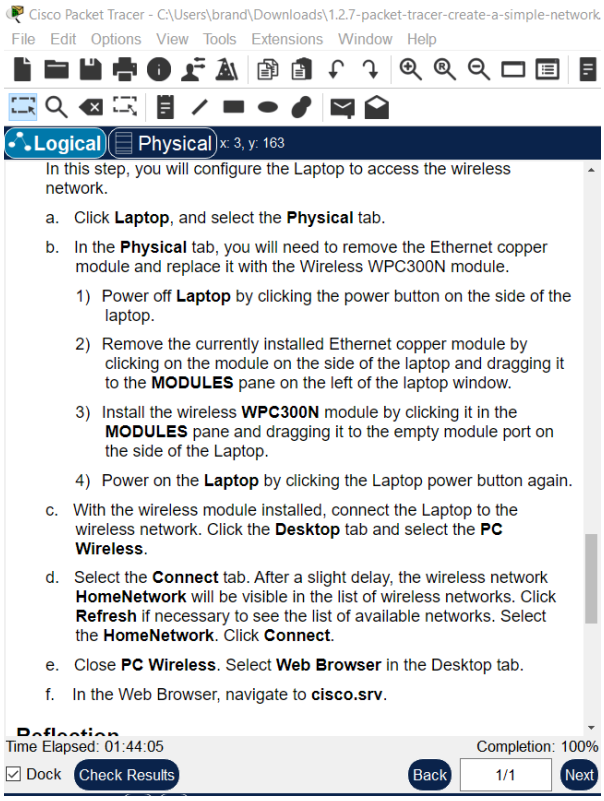


Exploring IoT certification

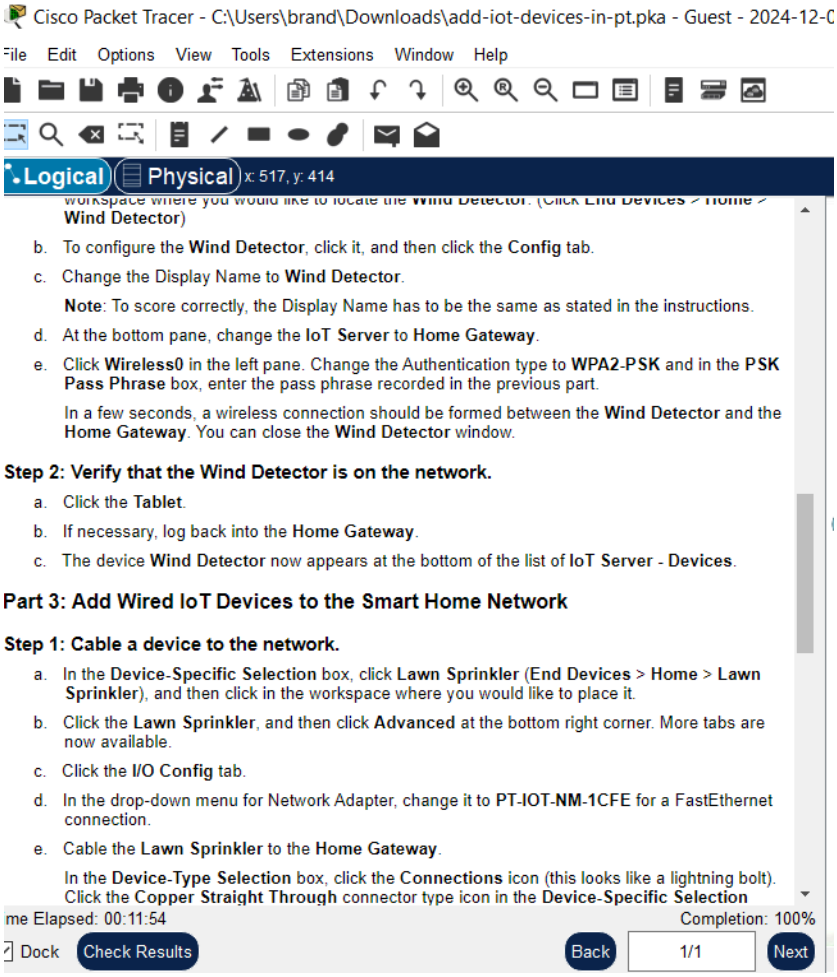


Introduction to IoT and Digital Transformation

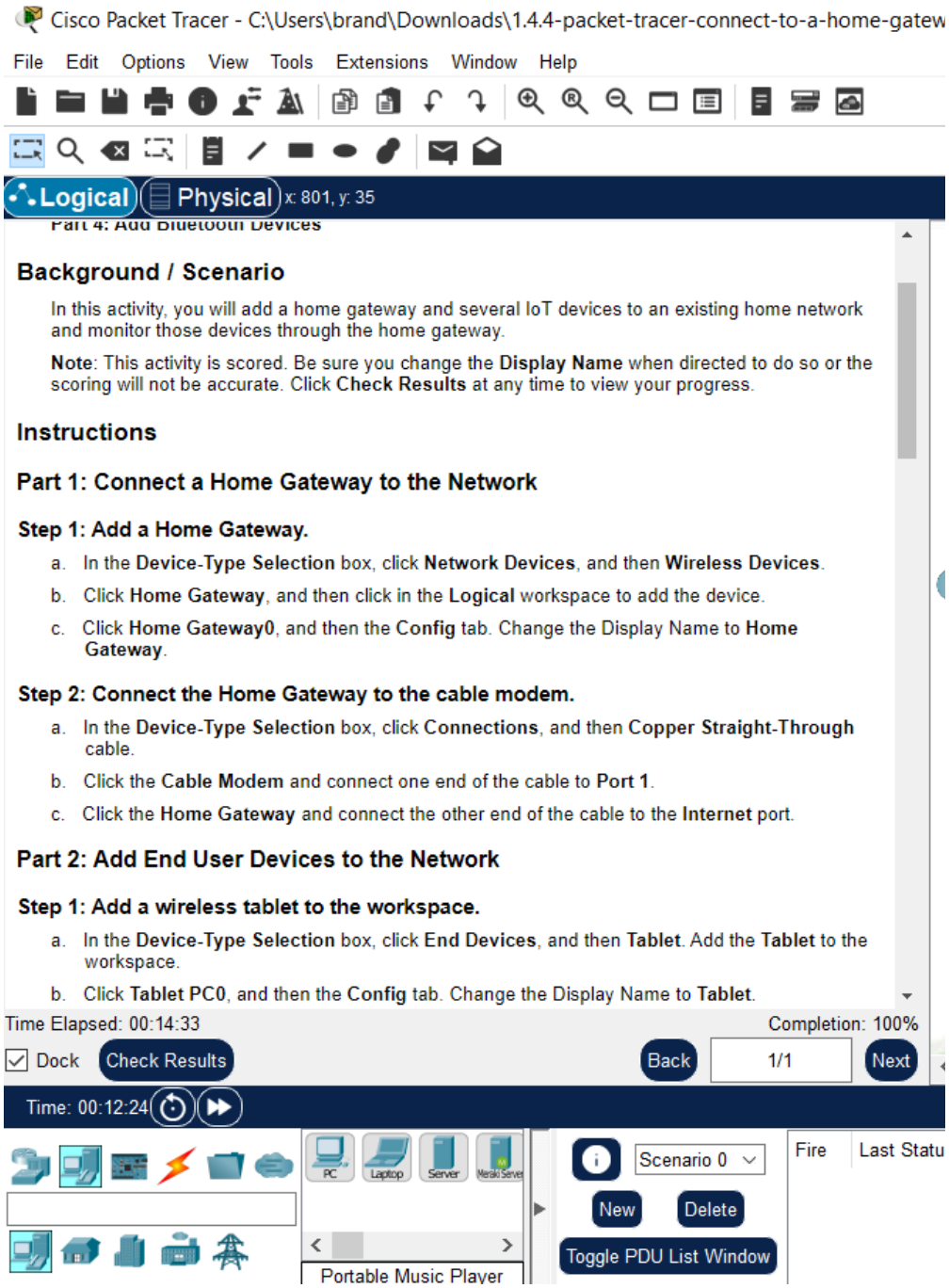
1.2.7



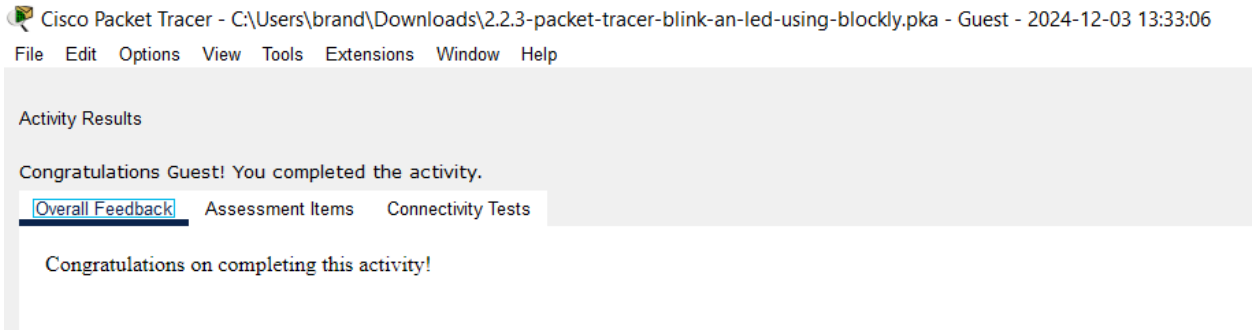
1.4.2


Cisco Packet Tracer - C:\Users\brand\Downloads\add-iot-devices-in-pt.pka - Guest - 2024-12-0
File Edit Options View Tools Extensions Window Help
Logical Physical x: 517, y: 414
Wind Detector)
b. To configure the Wind Detector, click it, and then click the Config tab.
c. Change the Display Name to Wind Detector.
Note: To score correctly, the Display Name has to be the same as stated in the instructions.
d. At the bottom pane, change the IoT Server to Home Gateway.
e. Click Wireless0 in the left pane. Change the Authentication type to WPA2-PSK and in the PSK Pass Phrase box, enter the pass phrase recorded in the previous part.
In a few seconds, a wireless connection should be formed between the Wind Detector and the Home Gateway. You can close the Wind Detector window.
Step 2: Verify that the Wind Detector is on the network.
a. Click the Tablet.
b. If necessary, log back into the Home Gateway.
c. The device Wind Detector now appears at the bottom of the list of IoT Server - Devices.
Part 3: Add Wired IoT Devices to the Smart Home Network
Step 1: Cable a device to the network.
a. In the Device-Specific Selection box, click Lawn Sprinkler (End Devices > Home > Lawn Sprinkler), and then click in the workspace where you would like to place it.
b. Click the Lawn Sprinkler, and then click Advanced at the bottom right corner. More tabs are now available.
c. Click the I/O Config tab.
d. In the drop-down menu for Network Adapter, change it to PT-IOT-NM-1CFE for a FastEthernet connection.
e. Cable the Lawn Sprinkler to the Home Gateway.
In the Device-Type Selection box, click the Connections icon (this looks like a lightning bolt). Click the Copper Straight Through connector type icon in the Device-Specific Selection
me Elapsed: 00:11:54
Completion: 100%
Dock
Check Results
Back
1/1
Next

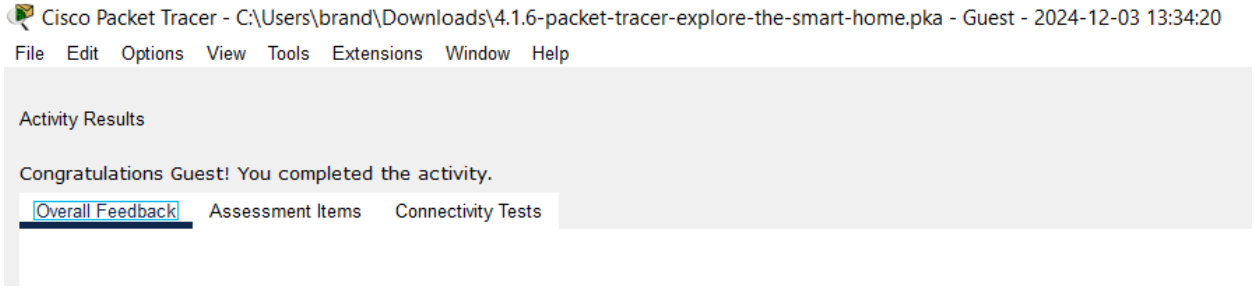
1.4.4


Cisco Packet Tracer - C:\Users\brand\Downloads\1.4.4-packet-tracer-connect-to-a-home-gatew
File Edit Options View Tools Extensions Window Help
Logical Physical x: 801, y: 35
Part 4: Add Bluetooth Devices
Background / Scenario
In this activity, you will add a home gateway and several IoT devices to an existing home network and monitor those devices through the home gateway.
Note: This activity is scored. Be sure you change the Display Name when directed to do so or the scoring will not be accurate. Click Check Results at any time to view your progress.
Instructions
Part 1: Connect a Home Gateway to the Network
Step 1: Add a Home Gateway.
a. In the Device-Type Selection box, click Network Devices, and then Wireless Devices.
b. Click Home Gateway, and then click in the Logical workspace to add the device.
c. Click Home Gateway0, and then the Config tab. Change the Display Name to Home Gateway.
Step 2: Connect the Home Gateway to the cable modem.
a. In the Device-Type Selection box, click Connections, and then Copper Straight-Through cable.
b. Click the Cable Modem and connect one end of the cable to Port 1.
c. Click the Home Gateway and connect the other end of the cable to the Internet port.
Part 2: Add End User Devices to the Network
Step 1: Add a wireless tablet to the workspace.
a. In the Device-Type Selection box, click End Devices, and then Tablet. Add the Tablet to the workspace.
b. Click Tablet PC0, and then the Config tab. Change the Display Name to Tablet.
Time Elapsed: 00:14:33
Completion: 100%
Dock
Check Results
Back
1/1
Next
Time: 00:12:24
PC
Laptop
Server
Scenario 0
Fire
Last Statu
New
Delete
Toggle PDU List Window
Portable Music Player

2.2.3

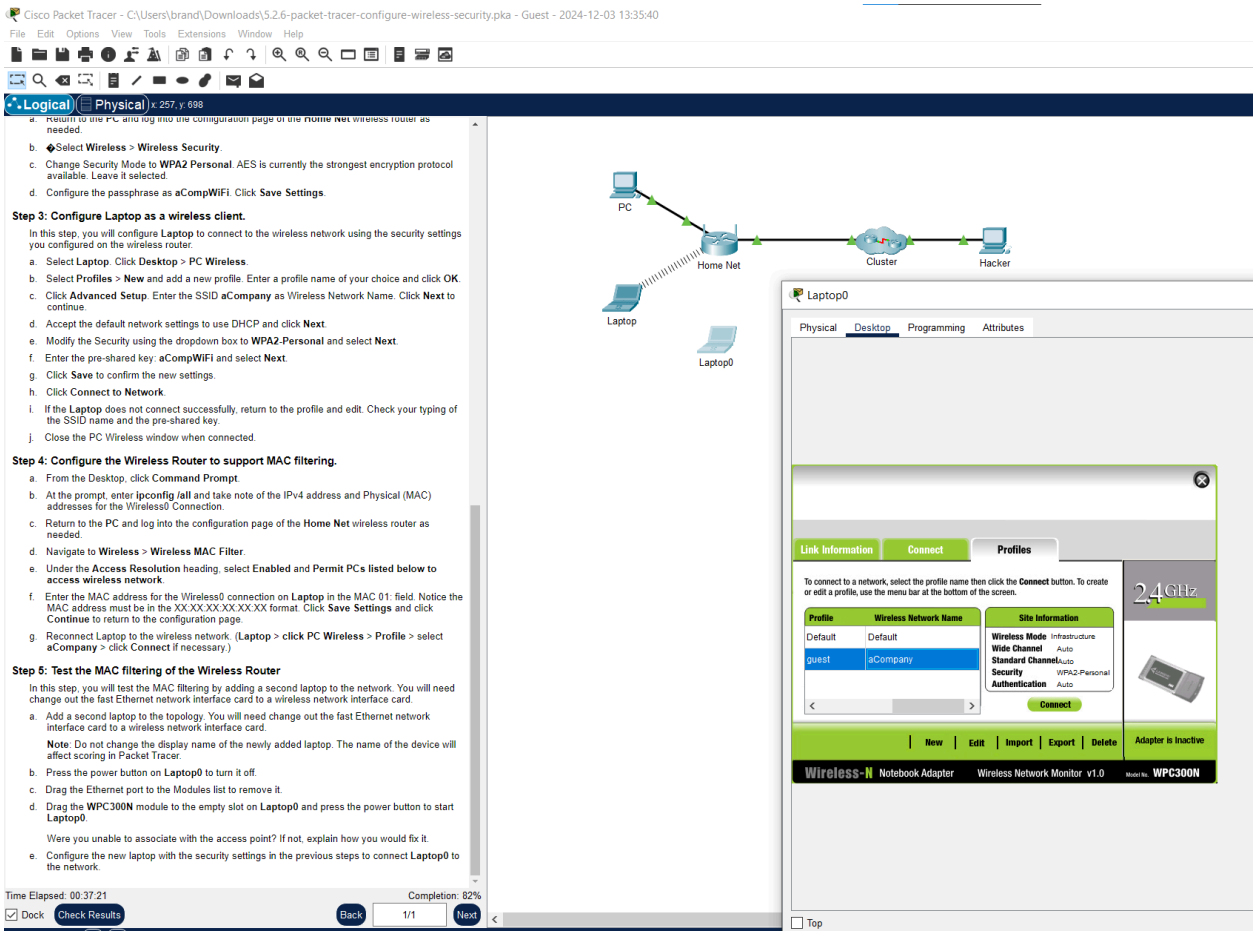

Cisco Packet Tracer - C:\Users\brand\Downloads\2.2.3-packet-tracer-blink-an-led-using-blockly.pka - Guest - 2024-12-03 13:33:06
File Edit Options View Tools Extensions Window Help
Activity Results
Congratulations Guest! You completed the activity.
Overall Feedback Assessment Items Connectivity Tests
Congratulations on completing this activity!

4.1.6

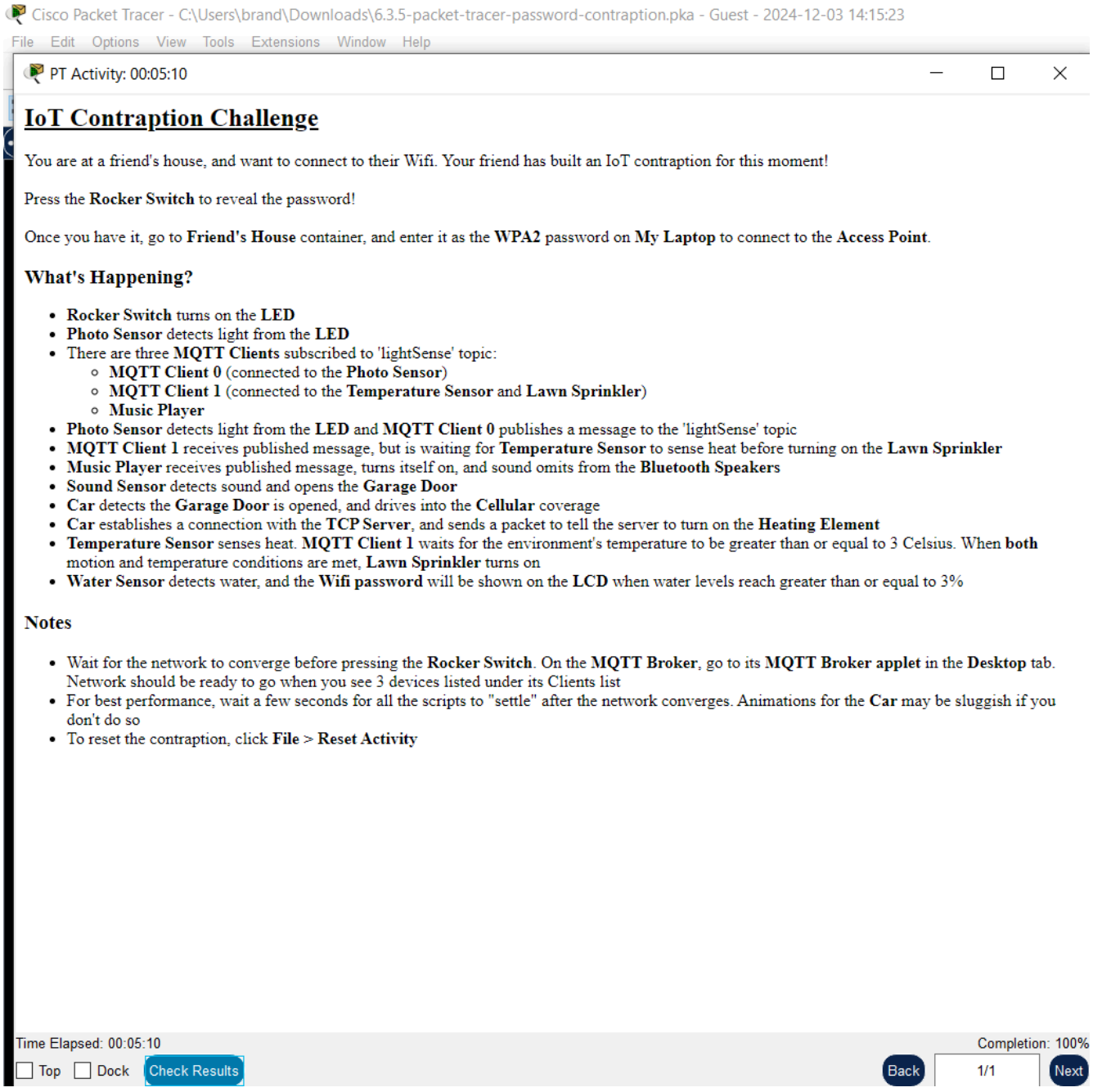

Cisco Packet Tracer - C:\Users\brand\Downloads\4.1.6-packet-tracer-explore-the-smart-home.pka - Guest - 2024-12-03 13:34:20
File Edit Options View Tools Extensions Window Help
Activity Results
Congratulations Guest! You completed the activity.
Overall Feedback Assessment Items Connectivity Tests

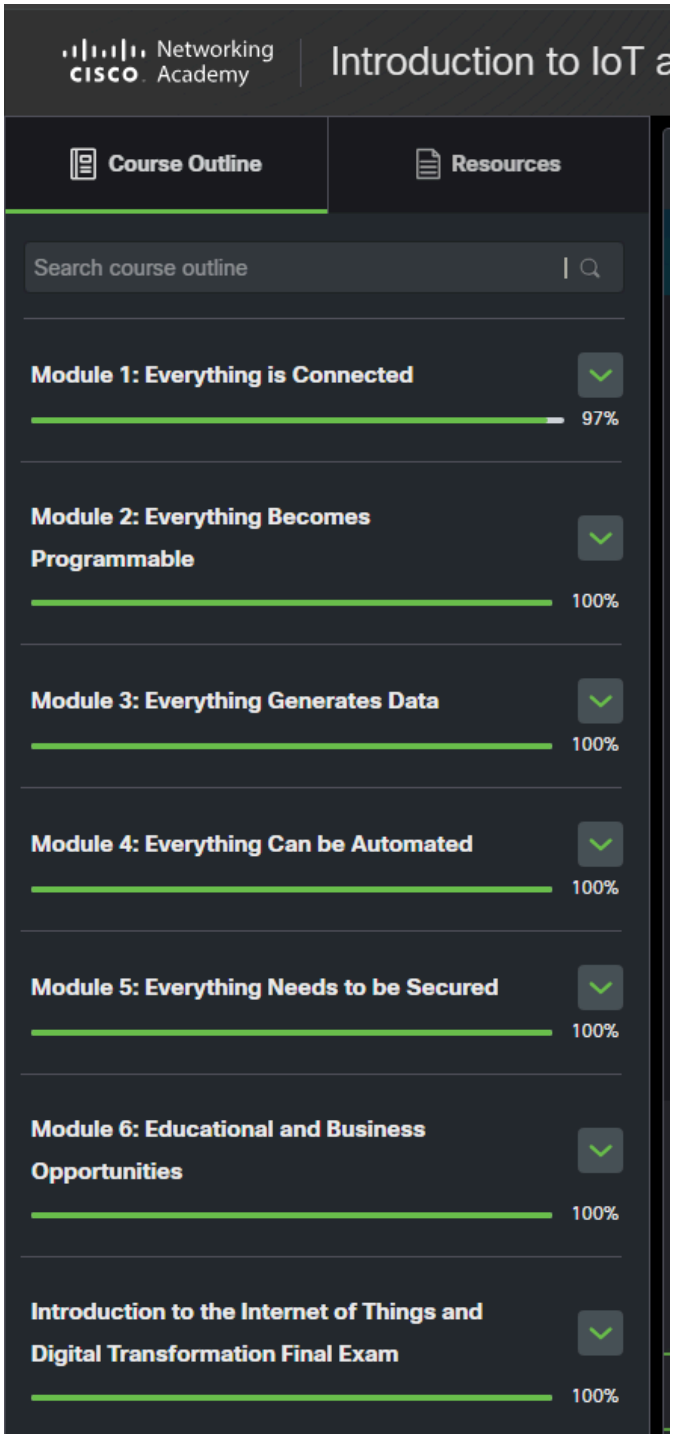
5.2.6

I should have 100% because I followed the same steps for setting the first laptop up for the WiFi and made sure the second laptop's MAC address was in the router info.



6.3.5


Cisco Packet Tracer - C:\Users\brand\Downloads\6.3.5-packet-tracer-password-contraption.pka - Guest - 2024-12-03 14:15:23
File Edit Options View Tools Extensions Window Help
PT Activity: 00:05:10
IoT Contraption Challenge
You are at a friend's house, and want to connect to their Wifi. Your friend has built an IoT contraption for this moment!
Press the Rocker Switch to reveal the password!
Once you have it, go to Friend's House container, and enter it as the WPA2 password on My Laptop to connect to the Access Point.
What's Happening?
Rocker Switch turns on the LED
Photo Sensor detects light from the LED
There are three MQTT Clients subscribed to 'lightSense' topic:
MQTT Client 0 (connected to the Photo Sensor)
MQTT Client 1 (connected to the Temperature Sensor and Lawn Sprinkler)
Music Player
Photo Sensor detects light from the LED and MQTT Client 0 publishes a message to the 'lightSense' topic
MQTT Client 1 receives published message, but is waiting for Temperature Sensor to sense heat before turning on the Lawn Sprinkler
Music Player receives published message, turns itself on, and sound omits from the Bluetooth Speakers
Sound Sensor detects sound and opens the Garage Door
Car detects the Garage Door is opened, and drives into the Cellular coverage
Car establishes a connection with the TCP Server, and sends a packet to tell the server to turn on the Heating Element
Temperature Sensor senses heat. MQTT Client 1 waits for the environment's temperature to be greater than or equal to 3 Celsius. When both motion and temperature conditions are met, Lawn Sprinkler turns on
Water Sensor detects water, and the Wifi password will be shown on the LCD when water levels reach greater than or equal to 3%
Notes
Wait for the network to converge before pressing the Rocker Switch. On the MQTT Broker, go to its MQTT Broker applet in the Desktop tab. Network should be ready to go when you see 3 devices listed under its Clients list
For best performance, wait a few seconds for all the scripts to "settle" after the network converges. Animations for the Car may be sluggish if you don't do so
To reset the contraption, click File > Reset Activity
Time Elapsed: 00:05:10
Completion: 100%
Top
Dock
Check Results
Back
1/1
Next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Introduction to IoT a
Course Outline
Resources
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Module 1: Everything is Connected
97%
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100%
Module 3: Everything Generates Data
100%
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Module 5: Everything Needs to be Secured
100%
Module 6: Educational and Business Opportunities
100%
Introduction to the Internet of Things and Digital Transformation Final Exam
100%

Introduction to IoT and Digitial Transformation Certification