Experiment 5

(Activity 4.6.5)

Aim: When working in Packet Tracer, a lab environment, or a corporate setting, we should know how to select the appropriate cable and how to properly connect devices. This activity will examine device configurations in Packet Tracer, selecting the proper cable based on the configuration, and connecting the devices. This activity will also explore the physical view of the network in Packet Tracer.

Theory:

Addressing Table

Device	Interface	IP Address	Connects To
Cloud	Eth6	N/A	F0/0
Cloud	Coax7	N/A	Port0
Cable Modem	Port0	N/A	Coax7
Cable Modem	Port1	N/A	Internet
Router0	Console	N/A	RS232
Router0	F0/0	192.168.2.1/24	Eth6
Router0	F0/1	10.0.0.1/24	F0
Router0	Ser0/0/0	172.31.0.1/24	Ser0/0
Router1	Ser0/0	172.31.0.2/24	Ser0/0/0
Router1	F1/0	172.16.0.1/24	F0/1
WirelessRouter	Internet	192.168.2.2/24	Port 1
WirelessRouter	Eth1	192.168.1.1	F0
Family PC	F0	192.168.1.102	Eth1
Switch	F0/1	172.16.0.2	F1/0
Netacad.pka	F0	10.0.0.254	F0/1
Configuration Terminal	RS232	N/A	Console

Objectives

Part 1: Connect to the Cloud

Part 2: Connect Router0

Part 3: Connect Remaining Devices

Part 4: Verify Connections

Part 5: Examine the Physical Topology

Background

When working in Packet Tracer (a lab environment or a corporate setting), you should know how to select the appropriate cable and how to properly connect devices. This activity will examine device configurations in Packet Tracer, selecting the proper cable based on the configuration, and connecting the devices. This activity will also explore the physical view of the network in Packet Tracer.

Instructions:

Part 1: Connect to the Cloud

Step 1: Connect the cloud to Router0.

a. At the bottom left, click the orange lightning icon to open the available **Connections**.

b. Choose the correct cable to connect **Router0 F0/0** to **Cloud Eth6**. **Cloud** is a type of switch, so use a **Copper Straight-Through** connection. If you attached the correct cable, the link lights on the cable turn green.

Step 2: Connect the cloud to Cable Modem.

Choose the correct cable to connect **Cloud Coax7** to **Modem Port0**.

If you attached the correct cable, the link lights on the cable turn green.

Part 2: Connect Router0

Step 1: Connect Router0 to Router1.

Choose the correct cable to connect **Router0 Ser0/0/0** to **Router1 Ser0/0**. Use one of the available **Serial** cables.

If you attached the correct cable, the link lights on the cable turn green.

Step 2: Connect Router0 to netacad.pka.

Choose the correct cable to connect **Router0 F0/1** to **netacad.pka F0**. Routers and computers traditionally use the same wires to transmit (1 and 2) and receive (3 and 6). The correct cable to choose consists of these crossed wires. Although many NICs can now autosense which pair is used to transmit and receive, **Router0** and **netacad.pka** do not have autosensing NICs.

If you attached the correct cable, the link lights on the cable turn green.

Step 3: Connect Router0 to the Configuration Terminal.

Choose the correct cable to connect **Router0 Console** to **Configuration Terminal RS232**. This cable does not provide network access to **Configuration Terminal**, but allows you to configure **Router0** through its terminal.

If you attached the correct cable, the link lights on the cable turn black.

Part 3: Connect Remaining Devices

Step 1: Connect Router1 to Switch.

Choose the correct cable to connect **Router1 F1/0** to **Switch F0/1**.

If you attached the correct cable, the link lights on the cable turn green. Allow a few seconds for the light to transition from amber to green.

Step 2: Connect Cable Modem to Wireless Router.

Choose the correct cable to connect **Cable Modem Port1** to **Wireless Router Internet** port.

If you attached the correct cable, the link lights on the cable will turn green.

Step 3: Connect Wireless Router to Family PC.

Choose the correct cable to connect **Wireless Router Ethernet 1** to **Family PC**.

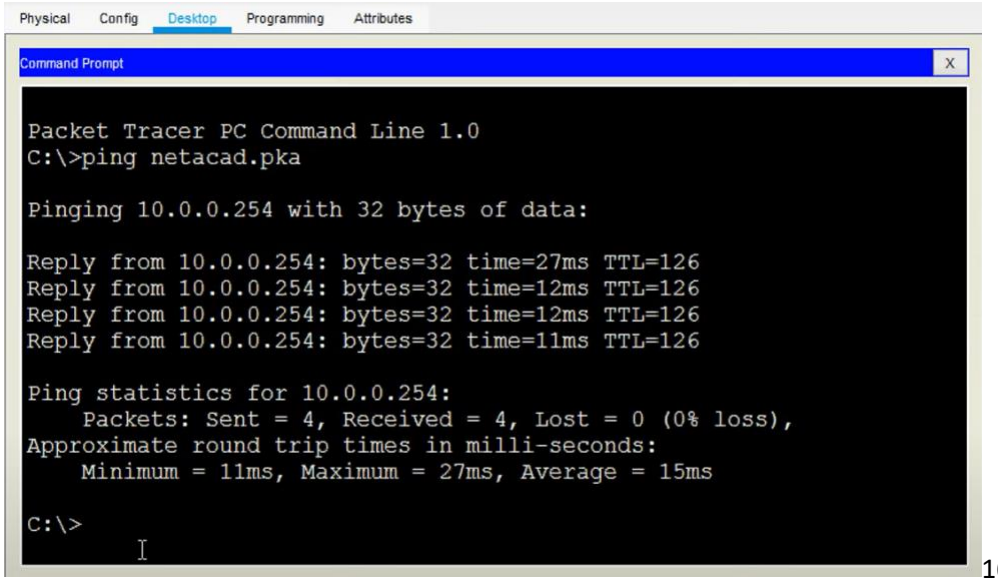
If you attached the correct cable, the link lights on the cable turn green.

Part 4: Verify Connections

Step 1: Test the connection from Family PC to netacad.pka.

a. Open the **Family PC** command prompt and ping **netacad.pka**.

b. Open the **Web Browser** and the web address **http://netacad.pka**.



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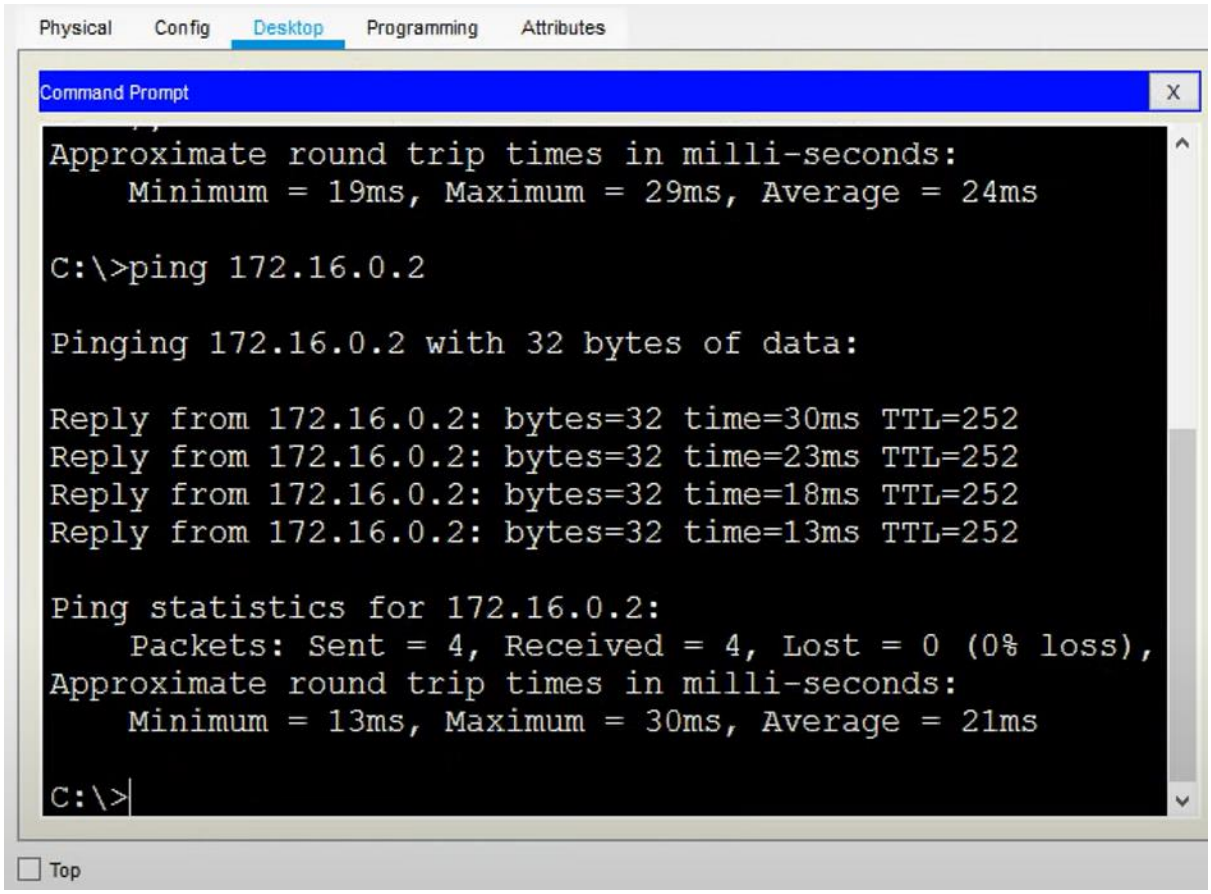
Step 2: Ping the Switch from Home PC.

Open the **Home PC** command prompt and ping the **Switch** IP address of to verify the connection.

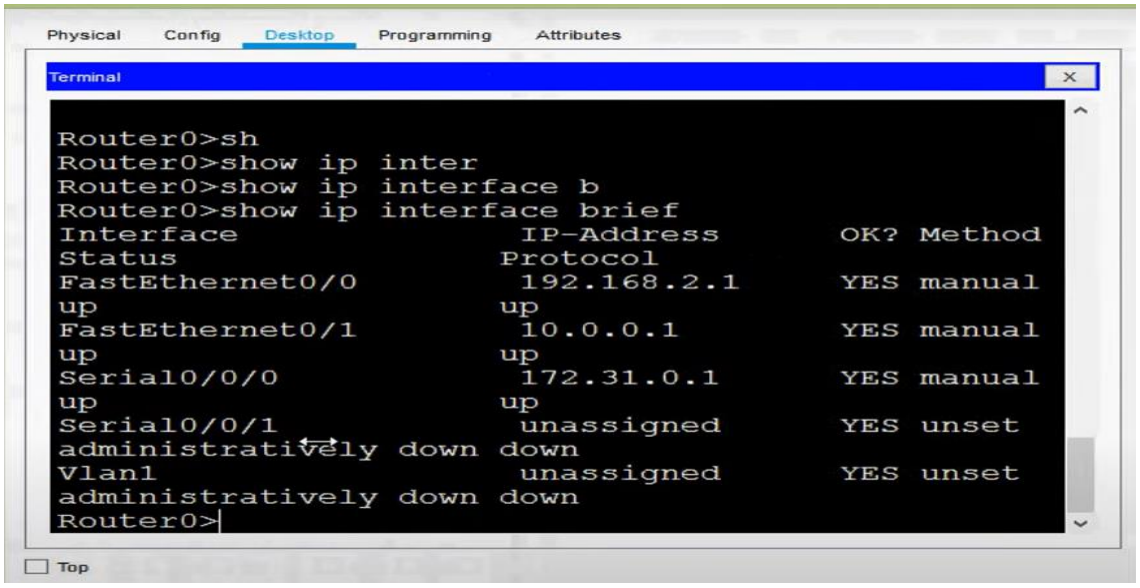


Step 3: Open Router0 from Configuration Terminal.

a. Open the **Terminal** of **Configuration Terminal** and accept the default settings.

b. Press **Enter** to view the **Router0** command prompt.

c. Type **show ip interface brief** to view interface statuses.



Part 5: Examine the Physical Topology

Step 1: Examine the Cloud.

a. Click the **Physical Workspace** tab or press **Shift**+**P** and **Shift**+**L** to toggle between the logical and physical workspaces.

b. Click the **Home City** icon.

c. Click the **Cloud** icon.

Question:

How many wires are connected to the switch in the blue rack?

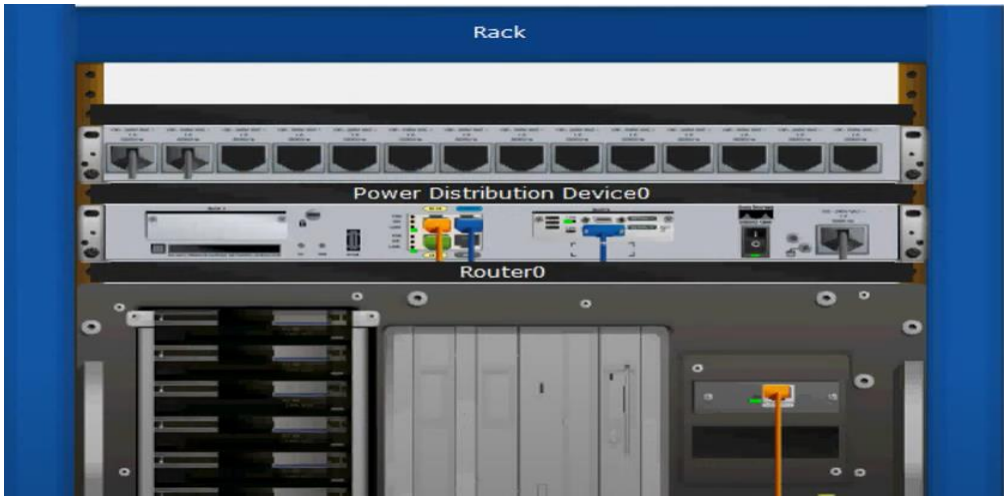
d. Click **Back** to return to **Home City**.

Step 2: Examine the Primary Network.

a. Click the **Primary Network** icon. Hold the mouse pointer over the various cables.

Question:

What is located on the table to the right of the blue rack?



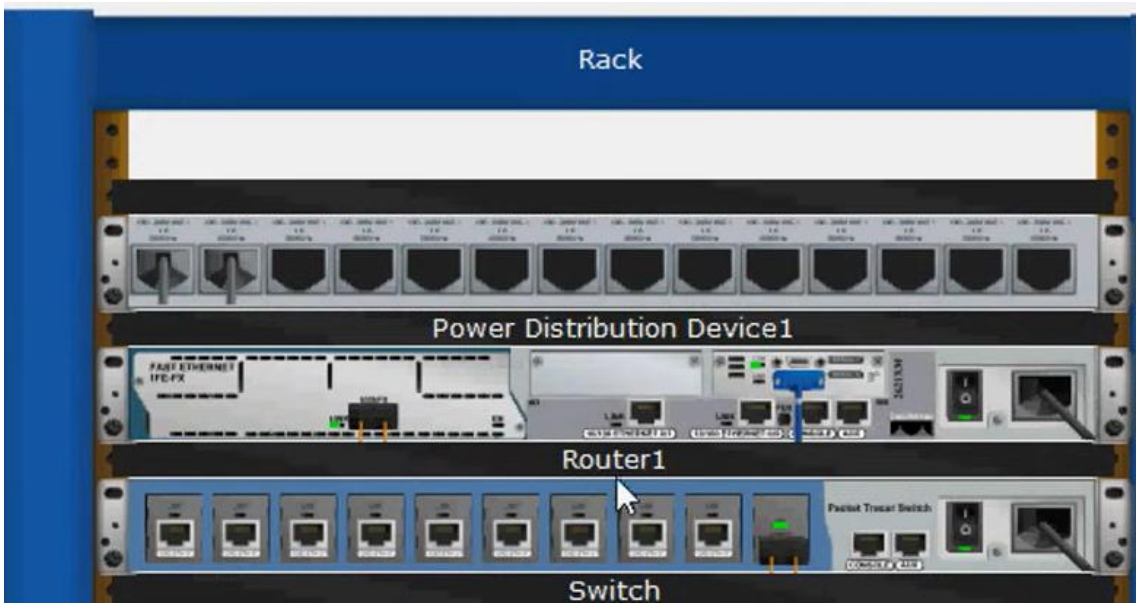
b. Click **Back** to return to **Home City**.

Step 3: Examine the Secondary Network.

a. Click the **Secondary Network** icon. Hold the mouse pointer over the various cables.

Question:

Why are there two orange cables connected to each device?



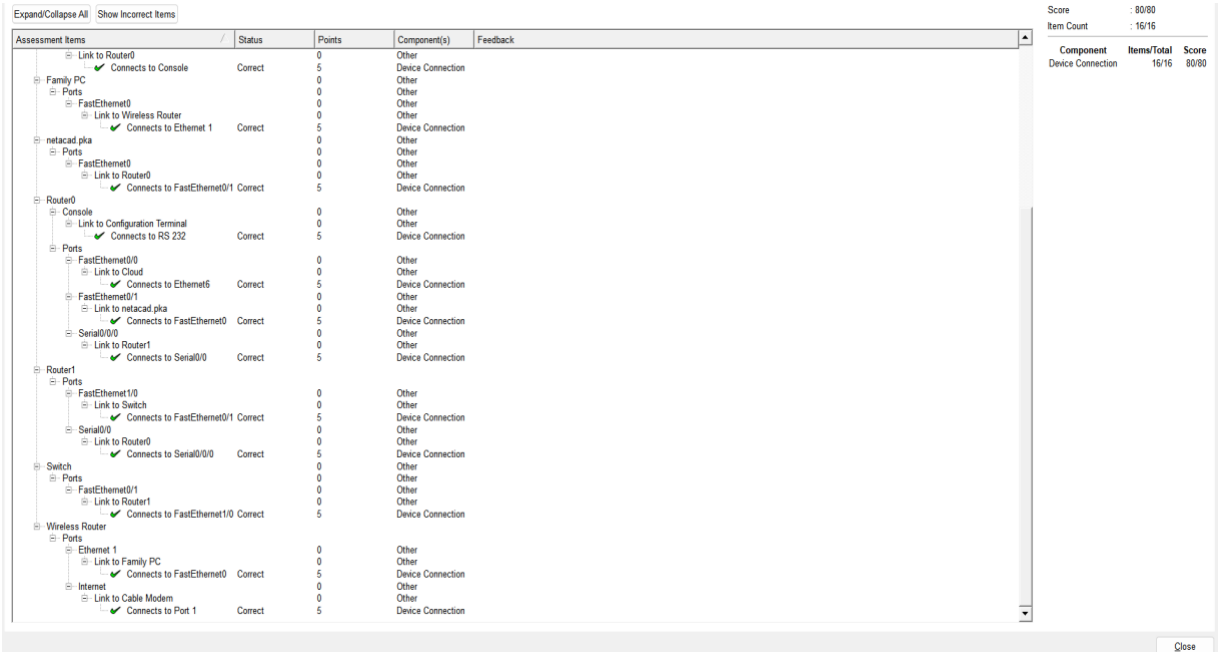
b. Click **Back** to return to **Home City**.

Step 4: Examine the Home Network.

a. Click the **Home Network** icon.

b. Click the **Logical Workspace** tab to return to the logical topology.

Result:



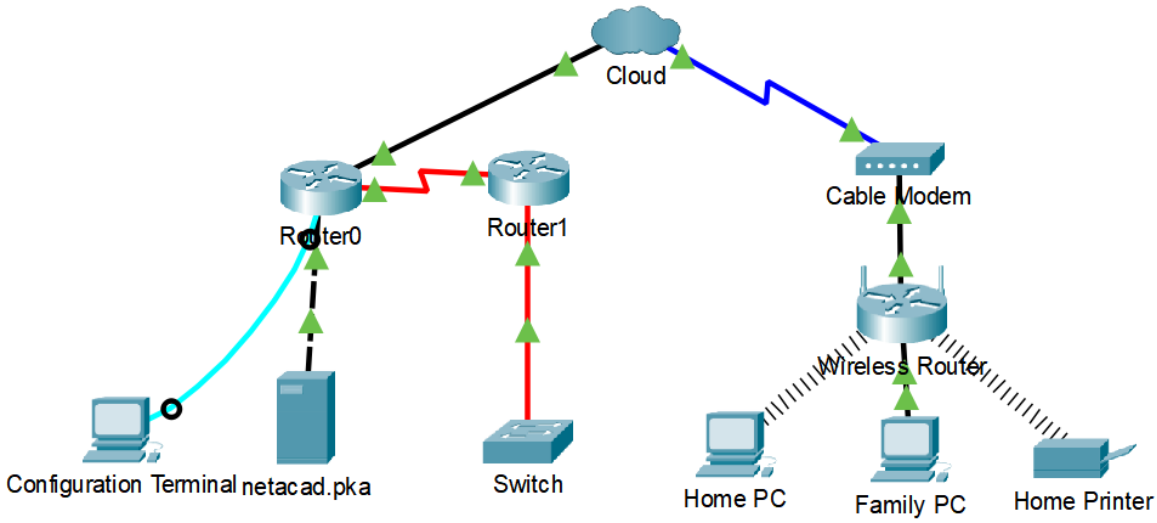
Expand/Collapse All | Show Incorrect Items

Assessment Items	Status	Points	Component(s)	Feedback
Link to Router0		0	Other	
Connects to Console	Correct	5	Device Connection	
Family PC		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
Link to Wireless Router		0	Other	
Connects to Ethernet 1	Correct	5	Device Connection	
netacad.pka		0	Other	
Ports		0	Other	
FastEthernet0		0	Other	
Link to Router0		0	Other	
Connects to FastEthernet0/1	Correct	5	Device Connection	
Router0		0	Other	
Console		0	Other	
Link to Configuration Terminal		0	Other	
Connects to RS 232	Correct	5	Device Connection	
Ports		0	Other	
FastEthernet0/0		0	Other	
Link to Cloud		0	Other	
Connects to Ethernet6	Correct	5	Device Connection	
FastEthernet0/1		0	Other	
Link to netacad.pka		0	Other	
Connects to FastEthernet0	Correct	5	Device Connection	
Serial0/0/0		0	Other	
Link to Router1		0	Other	
Connects to Serial0/0	Correct	5	Device Connection	
Router1		0	Other	
Ports		0	Other	
FastEthernet1/0		0	Other	
Link to Switch		0	Other	
Connects to FastEthernet0/1	Correct	5	Device Connection	
Serial0/0		0	Other	
Link to Router0		0	Other	
Connects to Serial0/0/0	Correct	5	Device Connection	
Switch		0	Other	
Ports		0	Other	
FastEthernet0/1		0	Other	
Link to Router1		0	Other	
Connects to FastEthernet1/0	Correct	5	Device Connection	
Wireless Router		0	Other	
Ports		0	Other	
Ethernet 1		0	Other	
Link to Family PC		0	Other	
Connects to FastEthernet0	Correct	5	Device Connection	
Internet		0	Other	
Link to Cable Modem		0	Other	
Connects to Port 1	Correct	5	Device Connection	

Score : 80/80
Item Count : 16/16

Component	Items/Total	Score
Device Connection	16/16	80/80

Close



Experiment 6

Aim: To Examine the Local IP Addressing Information , and Trace the Path Between Source and Destination (Activity 4.7.1)

Theory:

In this Packet Tracer Physical Mode (PTPM) activity, you will trace the physical path of IP packets from a home in Monterey, California to a web server at the University of Hawaii on the island of Oahu, Hawaii. You will do this in Packet Tracer and on your computer. In the Packet Tracer simulation, a student lives in Monterey, California (USA) and regularly uses a web browser to access the University of Hawaii's web site at www.hawaii.edu. As she views the information downloaded from the web server to her home computer, she becomes curious about how the IP packets traveled between Monterey and Hawaii. What is the path those packets actually take and how did they travel over the Pacific Ocean? You are also interested in these questions and will investigate the path from your unique location to the server in Hawaii. This activity follows the packets between two devices in two specific locations using their specific internet connections. Two other devices in both these same two locations, but using different internet connections (different ISPs), would most likely result in the IP packets taking a much different path. This activity is only one example of how a variety of internet and network service providers interconnect to create a path between two devices that are communicating using the internet. There are many different possibilities of what path the packets may take depending on the following:

- The location of the client computer
- The client's ISP
- The location of the server computer
- The server's ISP
- How the various ISPs and other entities interconnect to form a path between the client and the server

In this activity, you will begin to get an understanding of some of the various entities and organizations involved in making sure IP packets travel successfully between two devices on the internet. You will see how packets between your home computer, known as a client computer, travel to a web server.

Instructions:

- **Part 1: Examine Local IP Addressing Information**

  In this part, you will examine the IP addressing information in your home network.

  Step 1: What is my IPv4 address?

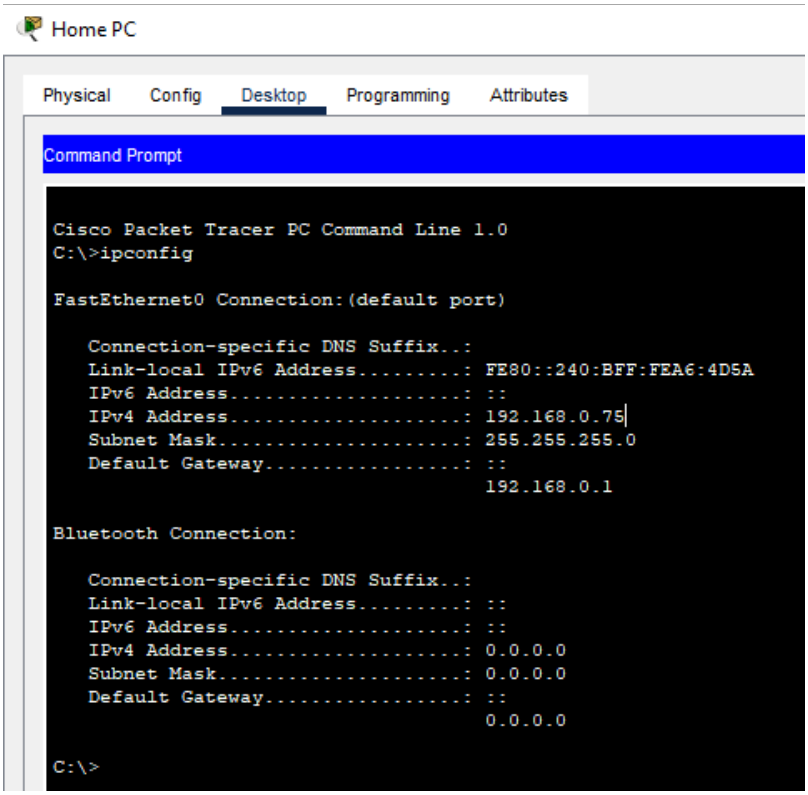
  Your IP address is used to identify your computer when sending and receiving packets, similar to how your home address is used to send and receive mail.

  Note: This activity opens inside the **Home Network**. If you explored other locations, navigate back to

the **Home Network**.

a. Click the **Home PC** sitting on the desk, and then click **Desktop** tab > **Command Prompt**.

b. Enter the ipconfig command and examine the IPv4 addressing information for **Home PC**



The IPv4 address is 192.168.0.75, which is known as a private IPv4 address. Most client computers and other devices use a **private IPv4 address**.

c. Repeat this step on your own device. What is the IPv4 address and default gateway for your device?

Step 2: What is the IPv4 address for my router?

This same Windows **ipconfig** command shows the IPv4 address of your local or home router, also known as the **default gateway**. Notice that our local router has the IPv4 address of 192.168.0.1.

This is the router that connects your local home network to your internet service provider's network and gives you access to the internet.

Note: You can use the **route -n get default** command to determine the default gateway on a computer using the MacOS or Linux operating system.

What is the IPv4 address for your router?

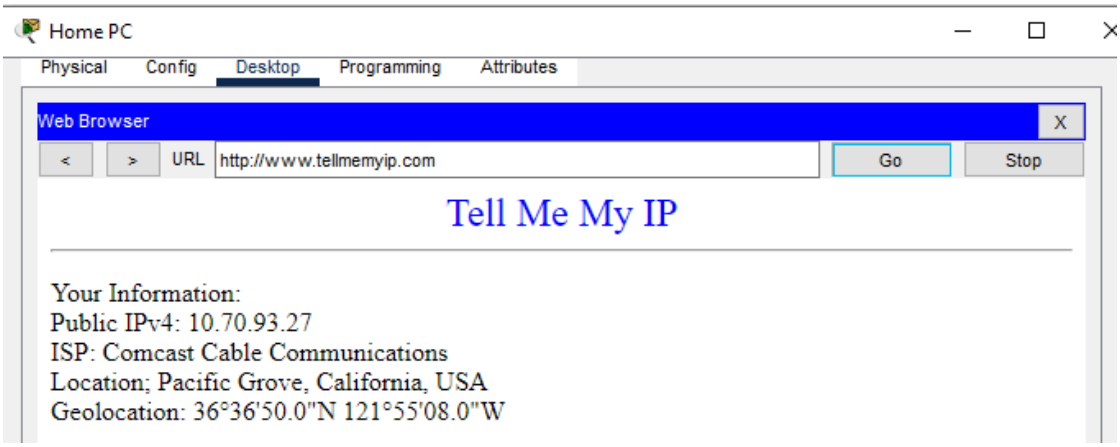
Step 3: What is my public IPv4 address?

Private IPv4 addresses are not routable on the internet. When IP packets leave your network, they need to have their private IPv4 address replaced with a public IPv4 address. The public IPv4 address is used by servers or any other destination to send packets back to your client computer.

a. On your device, search the internet for “what is my ip”. Some search engines will tell you your public IPv4 address without the need to visit another website. In addition, several web sites will be listed which will provide this and other information.

b. In Packet Tracer, close the **Command Window**, and then click **Web Browser**.

c. In the URL field, type **www.tellmemyip.com** and then click **Go**.



Step 4: Examine the connections in your network.

a. What does the connection look like between your device and your router? Is it wired or wireless?

b. Where is the router that your device uses to access the internet?

c. What does the connection look like between your router and the internet? Does it use a cable from the cable company or the phone company? Is it wireless? Can you find the cable as it leaves your house or see the remote tower if it is a wireless connection?

d. Search YouTube for “Tour of Home Network 2020 8-bit guy”. This is not your average home network but you may recognize many of the same devices found in your own home network

- **Part 2: Trace the Path Between Source and Destination**

  In this part, you will use the traceroute command that is used for network diagnostics and for displaying the path packets take to a destination. It gathers information about every hop from your device to the destination.

  Each line in the output designates the IP address of a router, used to forward packets from one network to another network. These are known as “hops”. In Windows, the command is tracert, whereas the macOS and Linux operating systems use the traceroute command.

Step 1: Use traceroute to display the path from Monterey to Hawaii.

a. In Packet Tracer, on the Home PC, close the Web Browser window if it is still open. From the Desktop tab, click Command Prompt.

b. Enter the tracert www.hawaii.edu command. Packet Tracer will take some time to resolve the domain name hawaii.edu to the IPv4 address. You can click Fast Forward Time (Alt+D) to speed up the process.

c. On your laptop or other computer, open a terminal window and enter the traceroute command for your operating system. Your output will be different from the output below and the output in Packet Tracer.
Your output will most likely show the names of real routers and public IPv4 addresses. Unless you live close to Monterey, California, you will likely have very different router names, IPv4 addresses, and number of hops.

```
C:\>tracert www.hawaii.edu

Tracing route to 172.31.149.56 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      192.168.0.1
  2    1 ms      0 ms      1 ms      10.120.89.61
  3    1 ms      0 ms      0 ms      10.110.178.133
  4    0 ms      0 ms      11 ms     10.139.198.129
  5    1 ms      0 ms      1 ms      10.151.78.177
  6    0 ms      1 ms      1 ms      10.110.41.121
  7    10 ms     0 ms      10 ms     10.110.46.30
  8    10 ms     10 ms     17 ms     10.110.37.178
  9    10 ms     11 ms     10 ms     10.110.32.246
  10    *         11 ms     0 ms      172.16.69.141
  11    10 ms     10 ms     10 ms     172.16.20.255
  12    13 ms     10 ms     12 ms     172.16.47.134
  13    *         11 ms     10 ms     172.30.205.29
  14    10 ms     10 ms     20 ms     172.30.213.2
  15    10 ms     31 ms     10 ms     172.30.1.2
  16    44 ms     62 ms     10 ms     172.30.2.2
  17    *         23 ms     21 ms     172.31.149.56

Trace complete.
```

d. When the output begins to time out, as for the 15th and 16th hop in the above output, enter Ctrl+C to end the traceroute. Otherwise, it will continue until the maximum of 30 hops is reached. The traceroute begins to timeout in this example because the router at the end of the path is most likely configured to not reply to traceroute requests.

The first highlighted entry in the example shows the first hop as 1.

e. Look closely at the first line of output. The three numbers preceding the IP address are timestamp values, such as 3ms, 4ms, 5ms, for the first hop. This is the roundtrip time between the source device

and the router at that IPv4 address, in milliseconds.

f. On your device, try tracing the route to other websites such as www.netacad.com or www.google.com.

Step 2: Investigate the second hop in the traceroute output.

The traceroute shows a second hop of:

2 13 ms 16 ms 11 ms 10.120.89.61

The local loop may be one of several different types of connections, including:

• Cable connection, typically using the same coaxial cable used for TV and phone

• DSL (Digital Subscriber Line) using same telephone line for phone and TV

• Wireless signals or Wireless local loop (WLL), including cellular technologies

• Satellite connection, typically the same beamed signal as used for TV

• Fiber-optic cable

• Dial-up access telephone line using same twisted-pair copper cable used for phone

a. In Packet Tracer, notice that the Home PC on the desk is connected to the Home Router on the shelf behind the desk. However, the Home Router is not connected directly to the router at the next hop.

Step 3: Attempt to discover the physical location of the IP address for your ISP POP.

Who owns the POP for the second router in your traceroute output? You can search the internet for "ip lookup", which will result in a list of web sites that will give you information about an IP address.

Step 4: Investigate why geolocation information is not always accurate.

Search the internet for "600 million IP addresses Kansas". You will find several articles about an ISP that chose to use a geolocation (latitude and longitude) at the center of the United States to register over 600 million of its IP addresses.

Step 5: Investigate the local ISP network.

For the example of real traceroute output shown below, hops 2 through 9 all belong to Comcast. Recall that the real IPv4 addresses for these routers have been modified for this activity. Therefore, you cannot use them to do an IP lookup. However, you can look up the IP addresses for your own traceroute output to determine how many of hops belong to your ISP.

C:\> tracert www.hawaii.edu

Tracing route to web00.its.hawaii.edu [172.31.149.56]

over a maximum of 30 hops:

1 3 ms 4 ms 3 ms 10.0.0.1

2 13 ms 16 ms 11 ms 10.120.89.61

3 44 ms 18 ms 18 ms po-302-1222-rur02.monterey.ca.sfba.comcast.net

[10.110.178.133]

4 13 ms 14 ms 13 ms po-2-rur01.monterey.ca.sfba.comcast.net

[10.139.198.129]

5 21 ms 17 ms 15 ms be-222-rar01.santaclara.ca.sfba.comcast.net

[10.151.78.177]

6 16 ms 20 ms 19 ms be-39931-cs03.sunnyvale.ca.ibone.comcast.net

[10.110.41.121]

7 27 ms 14 ms 20 ms be-1312-cr12.sunnyvale.ca.ibone.comcast.net

[10.110.46.30]

8 24 ms 19 ms 23 ms be-303-cr01.9greatoaks.ca.ibone.comcast.net

[10.110.37.178]

9 19 ms 21 ms 17 ms be-2211-pe11.9greatoaks.ca.ibone.comcast.net

[10.110.32.246]

10 16 ms 23 ms 16 ms ae-3.2011.rtsw.sunn.net.internet2.edu [172.16.69.141]

11 24 ms 24 ms 23 ms et-2-3-0.3457.rtsw.losa.net.internet2.edu

[172.16.20.255]

12 85 ms 87 ms 85 ms 172.16.47.134

13 87 ms 85 ms 85 ms xe-1-1-0-54-kolanut-re0.uhnet.net [172.30.205.29]

14 87 ms 86 ms 87 ms vl-669-10gigcolol3.uhnet.net [172.30.213.2]

15 * * * Request timed out.

16 * * * Request timed out.

^C

C:\>

a. In Packet Tracer, navigate to Monterey, and then click the monterey.ca building.

b. Notice that the two routers in the rack belong to comcast.net. You can hover your mouse over each

router to see the IPv4 addresses. You can also click each router and investigate IPv4 addressing on the Config tab.

c. What is the IPv4 address of the 3rd hop in the Packet Tracer traceroute output?

10.110.178.133

d. Which router and interface in the monterey.ca building is configured with this IPv4 address?

rur02.monterey.ca.sfba.comcast.net; GigabitEthernet0/0

e. What is the IPv4 address of the 4th hop in the Packet Tracer traceroute output?

10.139.198.129

f. Which router and interface in the monterey.ca building is configured with this IPv4 address?

rur01.monterey.ca.sfba.comcast.net; GigabitEthernet0/0

g. Why do you think the IP addresses for the other interfaces are not shown in the traceroute output?

Those interfaces are the source for the packets that are sent to the next hop destination. Source IP addresses are not shown in traceroute output.

h. List the hops in your own traceroute output that belong to your local ISP.

Step 6: Investigate the domain names in the output to discover more clues about the location of routers at each hop.

In traceroute output above, Comcast has provided information in the domain name that gives you a clue about where the router may actually be located:

- po-302-1222-rur02.monterey.ca.sfba.comcast.net
- po-2-rur01.monterey.ca.sfba.comcast.net
- be-222-rar01.santaclara.ca.sfba.comcast.net
- be-39931-cs03.sunnyvale.ca.ibone.comcast.net
- be-1312-cr12.sunnyvale.ca.ibone.comcast.net
- be-303-cr01.9greatoaks.ca.ibone.comcast.net
- be-2211-pe11.9greatoaks.ca.ibone.comcast.net

All of these cities are located with the same geographical region known as the San Francisco Bay Area (sfba) and are controlled by Comcast.

- Monterey, California
- Santa Clara, California
- Sunnyvale, California
- San Jose, California (9greatoaks.ca)

We have made the assumption in Packet Tracer that all routers with the same city in the domain name

are in the same data center. For example, as you have seen, these two routers are in the **monterey.ca** building:

- po-302-1222-rur02.monterey.ca.sfba.comcast.net
- po-2-rur01.monterey.ca.sfba.comcast.net

Step 7: Investigate the link between Comcast and Internet2.

This last hop within the Comcast ISP network before packets are forwarded to another ISP occurs at hop 9.

9 19 ms 21 ms 17 ms be-2211-pe11.9greatoaks.ca.ibone.comcast.net

[10.110.32.246]

```
Comcast ISP
1 3 ms 4 ms 3 ms 10.0.0.1
2 13 ms 16 ms 11 ms 10.120.89.61
3 44 ms 18 ms 18 ms po-302-1222-rur02.monterey.ca.sfba.comcast.net [10.110.178.133]
4 13 ms 14 ms 13 ms po-2-rur01.monterey.ca.sfba.comcast.net [10.139.198.129]
5 21 ms 17 ms 15 ms be-222-rar01.santaclara.ca.sfba.comcast.net [10.151.78.177]
6 16 ms 20 ms 19 ms be-39931-cs03.sunnyvale.ca.ibone.comcast.net [10.110.41.121]
7 27 ms 14 ms 20 ms be-1312-cr12.sunnyvale.ca.ibone.comcast.net [10.110.46.30]
8 24 ms 19 ms 23 ms be-303-cr01.9greatoaks.ca.ibone.comcast.net [10.110.37.178]
9 19 ms 21 ms 17 ms be-2211-pe11.9greatoaks.ca.ibone.comcast.net [10.110.32.246]
Internet2 ISP
10 16 ms 23 ms 16 ms ae-3.2011.rtsw.sunn.net.internet2.edu [172.16.69.141]
11 24 ms 24 ms 23 ms et-2-3-0.3457.rtsw.losa.net.internet2.edu [172.16.20.255]
12 85 ms 87 ms 85 ms 172.16.47.134
University of Hawaii
13 87 ms 85 ms 85 ms xe-1-1-0-54-kolanut-re0.uhnet.net [172.30.205.29]
14 87 ms 86 ms 87 ms vl-669-10gigcolol3.uhnet.net [172.30.213.2]
15 * * * Request timed out.
16 * * * Request timed out.
^C
```

Step 8: Investigate Internet2.

Internet2? Is this a new version of the internet? No. Internet2 is a non-for-profit ISP. It is a consortium of research, education, industry, and government communities that provide high-speed network services, cloud services, and other services tailored for research and education.

Search for the Wikipedia information and other web sites to get more information about Internet2. What speed is the Internet backbone that provides connections between its members?

For fun, search for “This Man Launched a New Internet Service Provider from His Garage”. It is the story about Brandt Kuykendall, a resident of the small town of Dillon Beach, California. The internet service in his town was too slow and expensive, so he started his own ISP from his garage.

Step 9: Investigate the link to Los Angeles.

Our traceroute reveals that the next hop is another Internet2 router. Luckily, the domain name provides us with this information.

11 24 ms 24 ms 23 ms et-2-3-0.3457.rtsw.losa.net.internet2.edu

[172.16.20.255]

A search of “internet2 router proxy” may help you verify that the “losa” in the domain name indicates that this Internet2 router is in Los Angeles, California. IP packets have left the San Francisco Bay Area (“sfba”) are traveling south approximately 350 miles to Los Angeles, California.

a. In Packet Tracer, navigate to the **Intercity** level, and then click **Los Angles**.

b. The **losa.net.internet2.edu** building is located somewhere in Los Angeles County. Click the building to enter it.

c. The rack has one router, which is connect to the San Francisco Bay Area and a submarine cable that crosses the Pacific Ocean. What is the interface used for this 11th hop in the traceroute output?
GigabitEthernet0/0

Step 10: Investigate the link across the Pacific Ocean.

The next hop in our traceroute is:

12 85 ms 87 ms 85 ms 172.16.47.134

Los Angeles, California. We also notice that there are no other places in our traceroute that show such a large difference in times as there is between hop 11 in California and hop 12.

b. What is the name of the submarine cable that runs from Hermosa Beach to Hawaii?
SEA-US

c. What is the name of the landing point in Hawaii?
Makaha

d. How many submarine cables terminate at this landing point in Hawaii?
At the time this activity was written, 4 submarine cables terminated at Makaha: HIFN (Hawaii Island Fibre Network), Japan-U.S. Cable Network (JUS), Paniolo Cable Network, and SEA-US.

e. The SEA-US cable was done through partnership between the University of Hawaii and RAM Telecom International, Inc. (RTI).

f. For more information, search YouTube or other video sites for “submarine cable.” You will find many videos showing how these cables are constructed and laid across the sea-bed.

g. In Packet Tracer, navigate to the **Intercity** level.

h. Click Honolulu. You are now on the island of Oahu. Notice that the submarine cable terminates at Makaha.

i. Click the i2px-Hawaii building. In the rack are two routers. The first one belongs to I2PX and represents the 12th hop in the traceroute output. What interface is assigned to the 12th hop?
GigabitEthernet0/0

Step 11: Investigate the link between Internet2 and the University of Hawaii network.

The next hop in our traceroute is:

13 87 ms 85 ms 85 ms xe-1-1-0-54-kolanut-re0.uhnet.net [205.166.205.29]

The domain name for this router indicates that it is part of the University of Hawaii network (uhnet.net). This router is located at the Honolulu Internet Exchange (HIX) in Honolulu, Hawaii, most likely located within the same IXP as the i2px.hawaii router.

In Packet Tracer, notice that the second router in **i2px-Hawaii** rack is **kolanut-re0.uhnet.net** router. What interface is assigned to the 13th hop?
GigabitEthernet0/0

Step 12: Investigate the last known IP address in the traceroute output.

In Packet Tracer, all the hops are simulated. Navigate back to **Honolulu** and investigate the **uhnet.net** building and the **hawaii.edu** campus. In each building, you will find the devices that simulate the rest of the traceroute path in Packet Tracer. In real world traceroute output, the hops begin to timeout. For the example in this activity, it times out at hop 15. It most likely times out for you at a different hop.

C:\> **tracert www.hawaii.edu**

Tracing route to web00.its.hawaii.edu [172.31.149.56]

over a maximum of 30 hops:

<output omitted>

14 87 ms 86 ms 87 ms vl-669-10gigcolol3.uhnet.net [172.30.213.2]

15 * * * Request timed out.

16 * * * Request timed out.

^C

Most likely a University of Hawaii router or firewall, prior to the web server, is blocking any further traceroutes messages from entering the network. However, you have tracked the path of these packets from Monterey, California all the way to the University of Hawaii in Honolulu.

Result:

Experiment 7

Aim: Packet Tracer - Connect the Physical Layer (Packet tracer 4.7.2)

Theory: In this activity, you will explore the different options available on internetworking devices. You will also be required to determine which options provide the necessary connectivity when connecting multiple devices. Finally, you will add the correct modules and connect the devices.

Objectives

Part 1: Identify Physical Characteristics of Internetworking Devices

Step 1: Identify the management ports of a Cisco router.

a. Click the East router. The Physical tab should be active.

b. Zoom in and expand the window to see the entire router.

Question: Which management ports are available?

Question: Which LAN and WAN interfaces are available on the East router and how many are there?

d. Click the CLI tab, press the Enter key to access the user mode prompt, and enter the following commands:

Open a configuration window

East> show ip interface brief

The output verifies the correct number of interfaces and their designation. The vlan1 interface is a virtual interface that only exists in software.

Question: How many physical interfaces are listed?

e. Enter the following commands:

East> show interface gigabitethernet 0/0

Question: What is the default bandwidth of this interface?

East> show interface serial 0/0/0

Question: What is the default bandwidth of this interface?

Note: Bandwidth on serial interfaces is used by routing processes to determine the best path to a destination.

Step 2: Identify module expansion slots.

Questions: How many expansion slots are available to add additional modules to the East router?

Click Switch2. How many expansion slots are available?

Part 2: Select Correct Modules for Connectivity

Step 1: Determine which modules provide the required connectivity.

a. Click East and then click the Physical tab. On the left, beneath the Modules label, you see the available options to expand the capabilities of the router. Click each module. A picture and a description display at the bottom. Familiarize yourself with these options.

Questions: 1) You need to connect PCs 1, 2, and 3 to the East router, but you do not have the necessary funds to purchase a new switch. Which module can you use to connect the three PCs to the East router?

2) How many hosts can you connect to the router using this module?

b. Click Switch2.

Question: Which module can you insert to provide a Gigabit optical connection to Switch3?

Step 2: Add the correct modules and power up devices.

a. Click East and attempt to insert the appropriate module from Step 1a. Modules are added by clicking the module and dragging it to the empty slot on the device.

The Cannot add a module when the power is on message should display. Interfaces for this router model are not hot-swappable.

b. Using the same procedure, insert the module that you identified in Step 1b into the empty slot farthest to the right in Switch2.

c. Use the show ip interface brief command on Switch2 to identify the slot in which the module was placed.

Question: Into which slot was it inserted?

Part 3: Connect Devices This may be the first activity you have done where you are required to connect devices. Although you may not know the purpose of the different cable types, use the table below and follow these guidelines to successfully connect all the devices:

a. Select the appropriate cable type.

b. Click the first device and select the specified interface.

c. Click the second device and select the specified interface.

d. If you have correctly connected two devices, you will see your score increase.

Example: To connect East to Switch1, select the Copper Straight-Through cable type. Click East and choose GigabitEthernet0/0. Then, click Switch1 and choose GigabitEthernet0/1. Your score should now be 4/55.

Part 4: Check Connectivity

Step 1: Check the interface status on East.

a. Click the CLI tab and enter the following commands:

East> show ip interface brief

Compare the output to the following:

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.30.1.1 YES manual up up

GigabitEthernet0/1 172.31.1.1 YES manual up up

Serial0/0/0 10.10.10.1 YES manual up up

Serial0/0/1 unassigned YES unset down down

FastEthernet0/1/0 unassigned YES unset up up

FastEthernet0/1/1 unassigned YES unset up up

FastEthernet0/1/2 unassigned YES unset up up

FastEthernet0/1/3 unassigned YES unset up down

Vlan1 172.29.1.1 YES manual up up

If all of the cabling is correct the outputs should match.

Close the configuration window

Step 2: Connect wireless devices, Laptop and TabletPC.

a. Click the Laptop and select the Config Tab. Select the Wireless0 interface. Put a check in the box labeled On next to Port Status. Within a few seconds the wireless connection should appear.

b. Click the Desktop tab of the Laptop. Click on the Web Browser icon to launch the web browser. Enter www.cisco.pka in the URL box and click Go. The page should display Cisco Packet Tracer.

c. Click the TabletPC and select the Config Tab. Select the Wireless0 interface. Put a check in the box labeled On next to Port Status. Within a few seconds the wireless connection should appear.

d. Repeat the steps in Step 2b to verify the page displays.

Step 3: Change the access method of the TabletPC.

a. Click the TabletPC and select the Config Tab. Select the Wireless0 interface. Uncheck the box labeled On next to Port Status. It should now be clear and the wireless connection will drop.

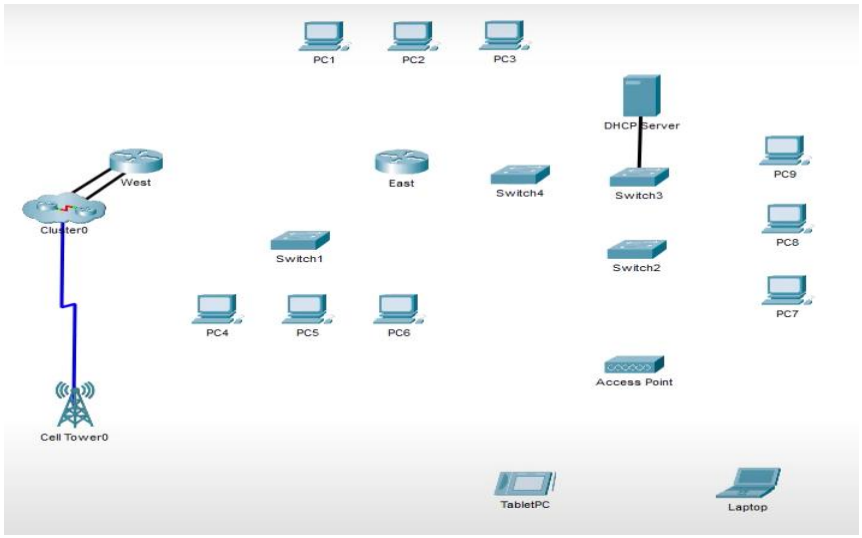
b. Click the 3G/4G Cell1 interface. Put a check in the box labeled On next to Port Status. Within a few seconds the cellular connection should appear.

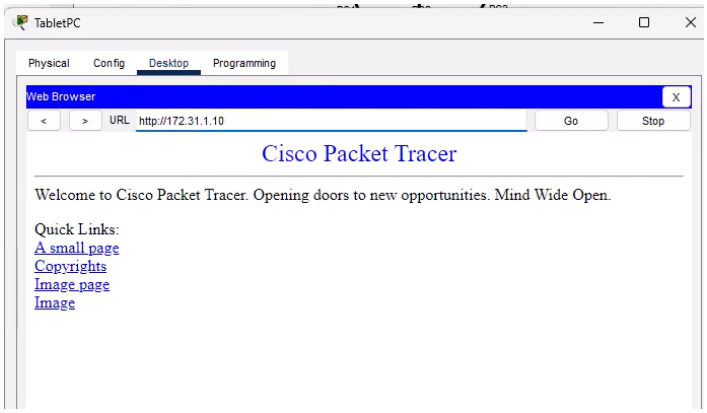
c. Repeat the process of verifying web access.

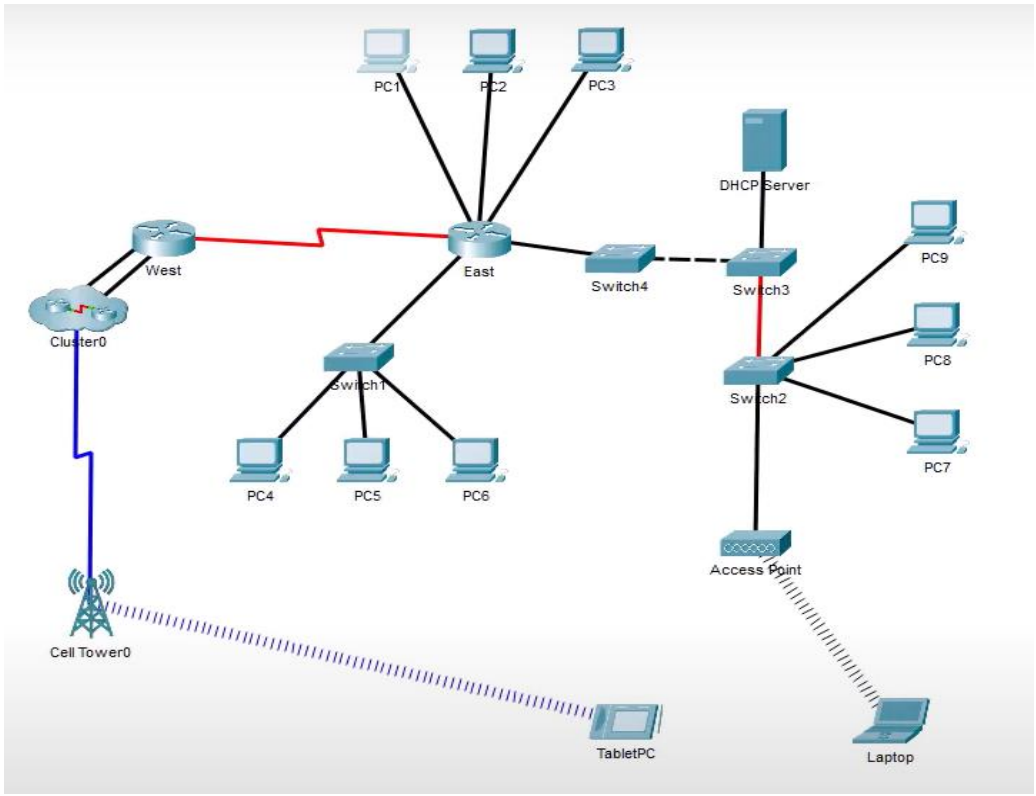
Step 4: Check connectivity of the other PCs.

All of the PCs should have connectivity to the web site and each other. You will learn to use connectivity testing in many upcoming labs.

Result:


PC1
PC2
PC3
DHCP Server
West
East
Switch4
Switch3
PC9
Cluster0
Switch1
Switch2
PC8
PC4
PC5
PC6
PC7
Access Point
Cell Tower0
TabletPC
Laptop


TabletPC
Physical
Config
Desktop
Programming
Web Browser
URL
http://172.31.1.10
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image


PC1
PC2
PC3
DHCP Server
West
East
Switch4
Switch3
PC9
Cluster0
Switch1
Switch2
PC8
PC4
PC5
PC6
PC7
Access Point
Cell Tower0
TabletPC
Laptop