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EXPERIMENT NO. 8

AIM: Study various network protocol analyser tools and analyse the network traffics using one of the network protocol analyser tools.

LO5: Analyse the traffic flow of different protocols.

THEORY:

The main purpose of Cisco Packet Tracer is to help students learn the principles of networking with hands-on experience as well as develop Cisco technology-specific skills. Since the protocols are implemented in a software-only method, this tool cannot replace the hardware Routers or Switches. Interestingly, this tool does not only include Cisco products but also many more networking devices.

Using this tool is widely encouraged as it is part of the curriculum like CCNA, and CCENT where Faculties use Packet Trace to demonstrate technical concepts and networking systems. Students complete assignments using this tool, working on their own or in teams.

Engineers prefer to test any protocols on Cisco Packet Tracer before implementing them. Also, Engineers who would like to deploy any change in the production network prefer to use Cisco Packet Tracer to first test the required changes and proceed to deploy if and only if everything is working as expected.

This makes the job easier for Engineers allowing them to add or remove simulated network devices, with a Command-line interface and a drag and drop user interface.

Workspace :

Logical – A logical workspace shows the logical network topology of the network the user has built. It represents the placing, connecting, and clustering of virtual network devices.

Physical – The physical workspace shows the graphical physical dimension of the logical network. It depicts the scale and placement in how network devices such as routers, switches, and hosts would look in a real environment. It also provides a geographical representation of networks, including multiple buildings, cities, and wiring closets.

Key Features:

- Unlimited devices
- E-learning
- Customize single/multi-user activities

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- Interactive Environment
- Visualizing Networks
- Real-time mode and Simulation mode
- Self-paced
- Supports majority of networking protocols
- International language support
- Cross platform compatibility

Configuration of the Network Devices:

Step 1: Configure the wireless router

Create the wireless network on the wireless router

Click on the Wireless Router icon on the Packet Tracer Logical workspace to open the device configuration window.

In the wireless router configuration window, click on the GUI tab to view configuration options for the wireless router.

Next, click on the Wireless tab in the GUI to view the wireless settings. The only setting that needs to be changed from the defaults is the Network Name (SSID). Here, type the name "HomeNetwork"

Configure the Internet connection on the wireless router

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Click on the Setup tab in the wireless router GUI.

In the DHCP Server settings verify that the Enabled button is selected and configure the static IP address of the DNS server as 208.67.220.220 as shown in the figure.

Click on the Save Settings tab.

The screenshot shows the 'Wireless Router' GUI with the 'Setup' tab selected. The 'Internet Setup' section is active, showing 'Automatic Configuration - DHCP' selected. The 'DHCP Server' is set to 'Enabled'. The 'Start IP Address' is 192.168.0.100, 'Maximum number' is 50, and 'IP Address Range' is 192.168.0.100 - 149. The 'Client Lease Time' is 0 minutes. The 'Router IP' is 192.168.0.1 and the 'Subnet Mask' is 255.255.255.0.

Wireless Router
Physical Config GUI
Wireless-N Broadband Router
Firmware Version: v0.93.3
WRT300N
Status
Setup Wireless Security Access Restrictions Applications & Gaming Administration Advanced Routing
Internet Setup
Internet Connection type: Automatic Configuration - DHCP
Optional Settings (required by some internet service providers):
Host Name:
Domain Name:
MTU: Size: 1500
Network Setup
Router IP: IP Address: 192.168.0.1 Subnet Mask: 255.255.255.0
DHCP Server Settings
DHCP Server: ☒ Enabled ☐ Disabled DHCP Reservation
Start IP Address: 192.168.0.100
Maximum number: 50
IP Address Range: 192.168.0.100 - 149
Client Lease Time: 0 minutes (0 means one day)

The screenshot shows the 'Wireless Router' GUI with the 'Setup' tab selected. The 'Network Setup' section is active, showing 'Router IP' and 'DHCP Server Settings'. The 'Static DNS 1' is configured as 208.67.220.220. The 'Router IP' is 192.168.0.1 and the 'Subnet Mask' is 255.255.255.0.

Wireless Router
Physical Config GUI
Internet service providers)
MTU: Size: 1500
Network Setup
Router IP: IP Address: 192.168.0.1 Subnet Mask: 255.255.255.0
DHCP Server Settings
DHCP Server: ☒ Enabled ☐ Disabled DHCP Reservation
Start IP Address: 192.168.0.100
Maximum number: 50
IP Address Range: 192.168.0.100 - 149
Client Lease Time: 0 minutes (0 means one day)
Static DNS 1: 208.67.220.220
Static DNS 2: 0.0.0.0
Static DNS 3: 0.0.0.0
WINS: 0.0.0.0

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Step 2: Configure the laptop

Configure the Laptop to access the wireless network

Click on the Laptop icon on the Packet Tracer Logical workspace and in the laptop configuration windows select the Physical tab.

In the Physical tab, you will need to remove the Ethernet copper module and replace it with the Wireless WPC300N module.

To do this, you first power the Laptop off by clicking the power button on the side of the laptop. Then remove the currently installed Ethernet copper module by clicking on the module on the side of the laptop and dragging it to the MODULES pane on the left of the laptop window. Then install the Wireless WPC300N module by clicking on it in the MODULES pane and dragging it to the empty module port on the side of the laptop. Power the laptop back on by clicking on the Laptop power button again.

With the wireless module installed, the next task is to connect the laptop to the wireless network.

Click on the Desktop tab at the top of the Laptop configuration window and select the PC Wireless icon.

Once the Wireless-N Notebook Adapter settings are visible, select the Connect tab. The wireless network “HomeNetwork” should be visible in the list of wireless networks.

Select the network, and click on the Connect tab found below the Site Information pan



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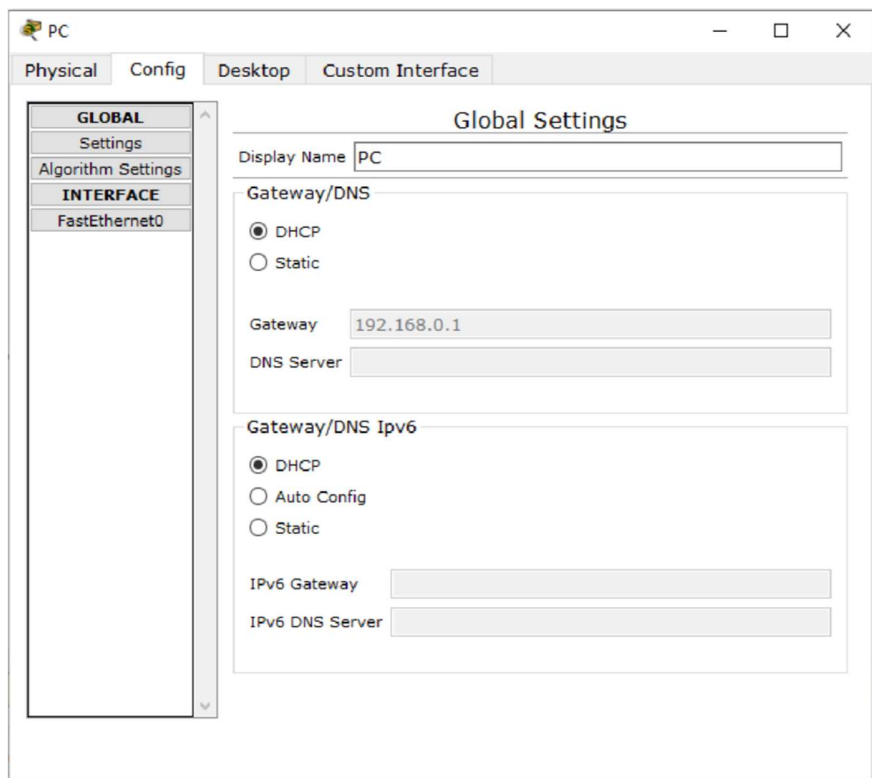
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Step 3: Configure the PC

Configure the PC for the wired network

Click on the PC icon on the Packet Tracer Logical workspace and select the Desktop tab and then the IP Configuration icon.

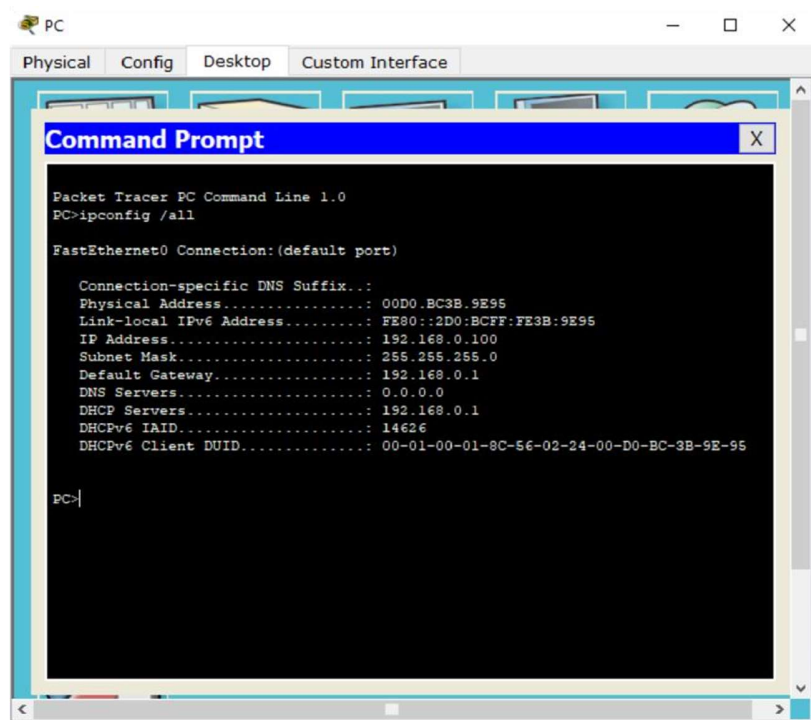
In the IP Configuration window, select the DHCP radio button as shown in the figure so that the PC will use DHCP to receive an IPv4 address from the wireless router. Close the IP Configuration window.



Click on the Command Prompt icon. Verify that the PC has received an IPv4 address by issuing the **ipconfig /all** command from the command prompt as shown in the figure. The PC should receive an IPv4 address in the 192.168.0.x range.

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Step 4: Configure the Internet cloud

Install network modules if necessary

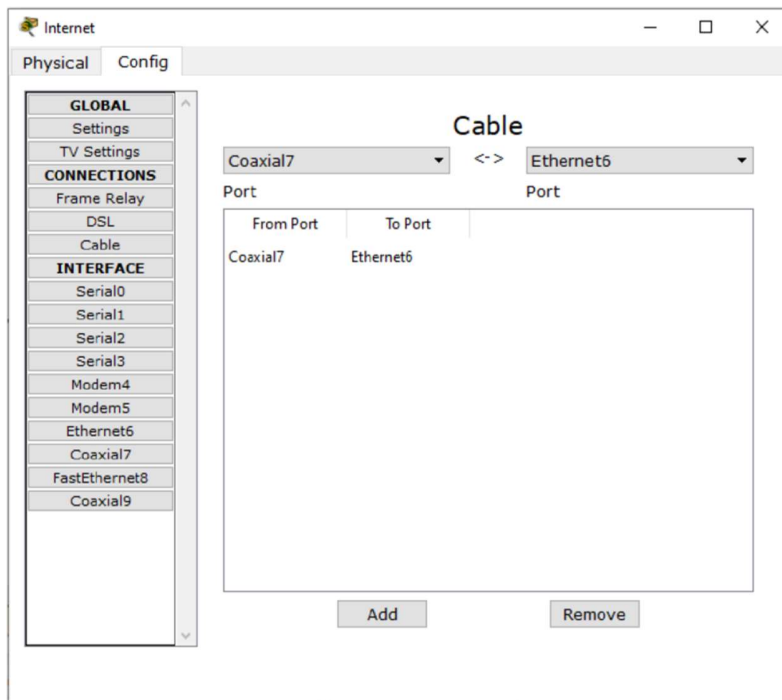
Click on the Internet Cloud icon on the Packet Tracer Logical workspace and then click on the Physical tab. The cloud device will need two modules if they are not already installed. The PT-CLOUD-NM-1CX which is for the cable modem service connection and the PT-CLOUD-NM-1CFE which is for a copper Ethernet cable connection. If these modules are missing, power off the physical cloud devices by clicking on the power button and drag each module to an empty module port on the device and then power the device back on.

Identify the From and To Ports

Click on the Config tab in the Cloud device window. In the left pane click on Cable under CONNECTIONS. In the first drop-down box choose Coaxial and in the second drop-down box choose Ethernet then click the Add button to add these as the From Port and To Port.

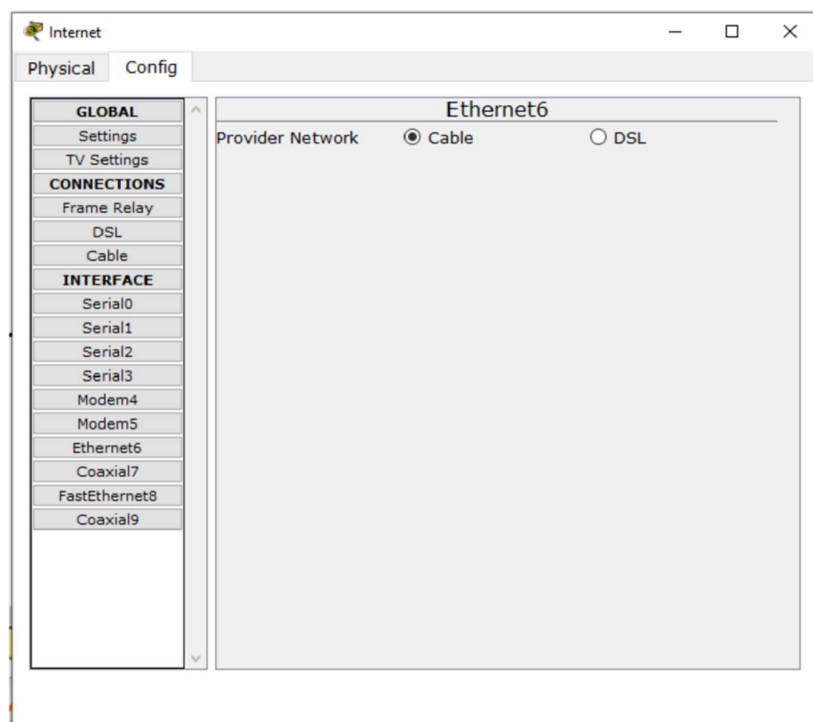
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Identify the type of provider

While still in the Config tab click Ethernet under INTERFACE in the left pane. In the Ethernet configuration window select Cable as the Provider Network.



Step 5: Configure the Cisco.com server

Configure the Cisco.com server as a DHCP server

Click on the Cisco.com server icon on the Packet Tracer Logical workspace and select the Services tab.

Select DHCP from the SERVICES list in the left pane.

In the DHCP configuration window, configure a DHCP as shown in the figure with the following settings.

- Click On to turn the DHCP service on
- Pool name: DHCPpool
- Default Gateway: 208.67.220.220
- DNS Server: 208.67.220.220
- Starting IP Address: 208.67.220.1
- Subnet Mask 255.255.255.0
- Maximum number of Users: 50

Click Add to add the pool

Configure the Cisco.com server as a DNS server to provide domain name to IPv4 address resolution.

While still in the Services tab, select DNS from the SERVICES listed in the left pane.

Configure the DNS service using the following settings as shown in the figure.

- Click On to turn the DNS service on
- Name: Cisco.com
- Type: A Record
- Address: 208.67.220.220 Click Add to add the DNS service settings

The screenshot shows the configuration window for the Cisco.com server. The 'Services' tab is selected. On the left, the 'SERVICES' list has 'DNS' selected. The main configuration area for DNS is visible, showing the 'DNS Service' is turned 'On'. Under 'Resource Records', a record is configured with 'Name' as 'cisco.com', 'Type' as 'A Record', and 'Address' as '208.67.220.220'. The 'Add' button is highlighted. Below the configuration fields, a table lists the configured records.

| No. | Name | Type | Detail |
|-----|-----------|----------|----------------|
| 0 | cisco.com | A Record | 208.67.220.220 |

At the bottom of the window, there is a 'DNS Cache' section.

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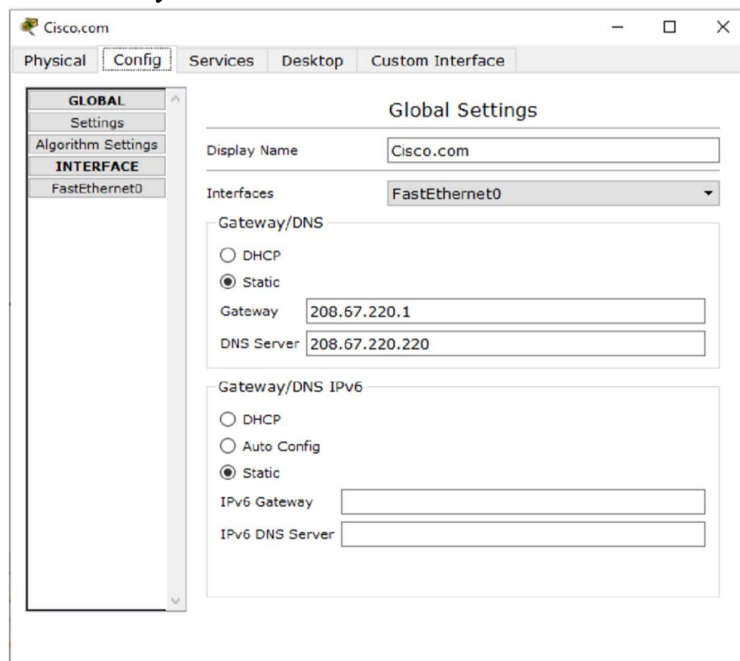
Configure the Cisco.com server Global settings.

Select the Config tab.

Click on Settings in left pane.

Configure the Global settings of the server as follows:

- Select Static
- Gateway: 208.67.220.1



Configure the Cisco.com server FastEthernet0 Interface settings.

Click on FastEthernet in left pane of the Config tab

Configure the FastEthernet Interface settings of the server as follows:

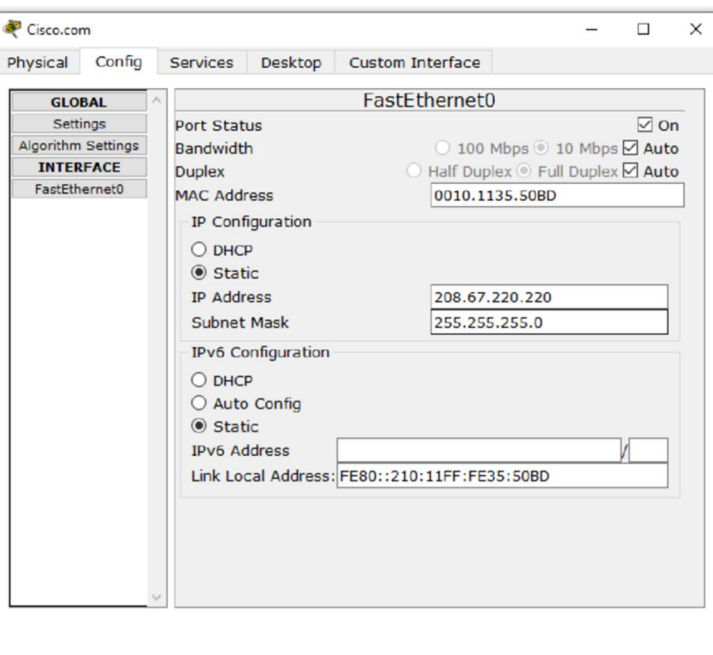
- Select Static under IP Configuration
- IP Address: 208.67.220.220
- Subnet Mask: 255.255.255.0
- DNS Server: 208.67.220.220

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Verify the Connectivity:

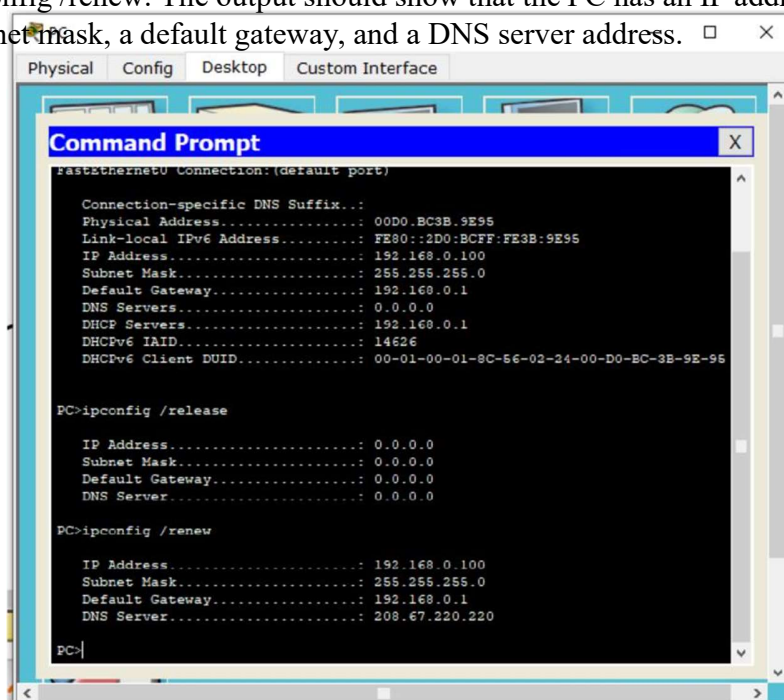
Step 1: Refresh the IPv4 settings on the PC

Verify that the PC is receiving IPv4 configuration information from DHCP.

Click on the PC on the Packet Tracer Logical workspace and then select the Desktop tab of the PC configuration window.

Click on the Command Prompt icon

In the command prompt refresh the IP settings by issuing the commands `ipconfig /release` and then `ipconfig /renew`. The output should show that the PC has an IP address in the 192.168.0.x range, a subnet mask, a default gateway, and a DNS server address.

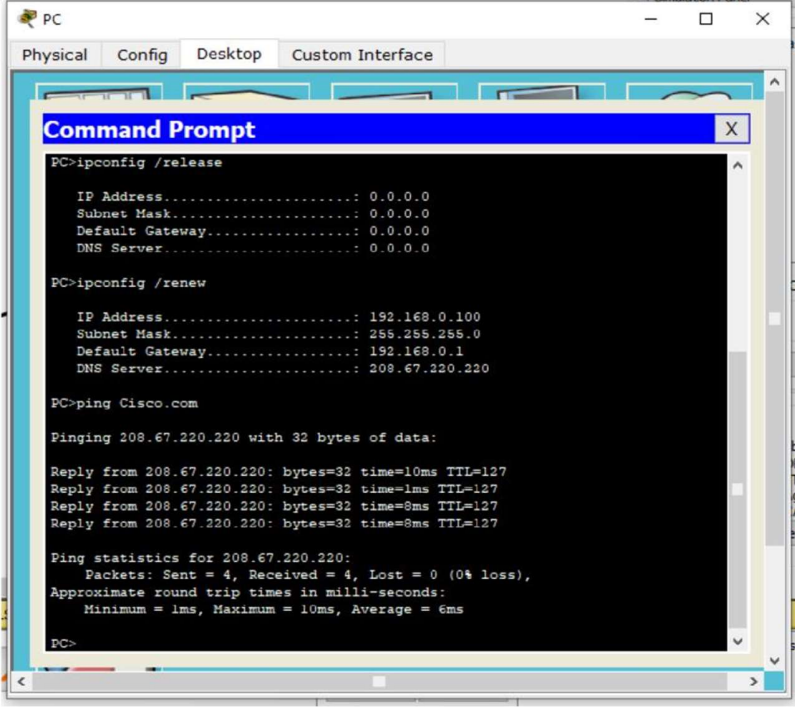


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Test connectivity to the Cisco.com server from the PC

From the command prompt, issue the command ping Cisco.com. It may take a few seconds for the ping to return. Four replies should be received.



The screenshot shows a PC window titled "PC" with tabs for "Physical", "Config", "Desktop", and "Custom Interface". The "Config" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the following commands and output:

```
PC>ipconfig /release

IP Address. . . . . : 0.0.0.0
Subnet Mask. . . . . : 0.0.0.0
Default Gateway. . . . : 0.0.0.0
DNS Server. . . . . : 0.0.0.0

PC>ipconfig /renew

IP Address. . . . . : 192.168.0.100
Subnet Mask. . . . . : 255.255.255.0
Default Gateway. . . . : 192.168.0.1
DNS Server. . . . . : 208.67.220.220

PC>ping Cisco.com

Pinging 208.67.220.220 with 32 bytes of data:

Reply from 208.67.220.220: bytes=32 time=10ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=8ms TTL=127
Reply from 208.67.220.220: bytes=32 time=8ms TTL=127

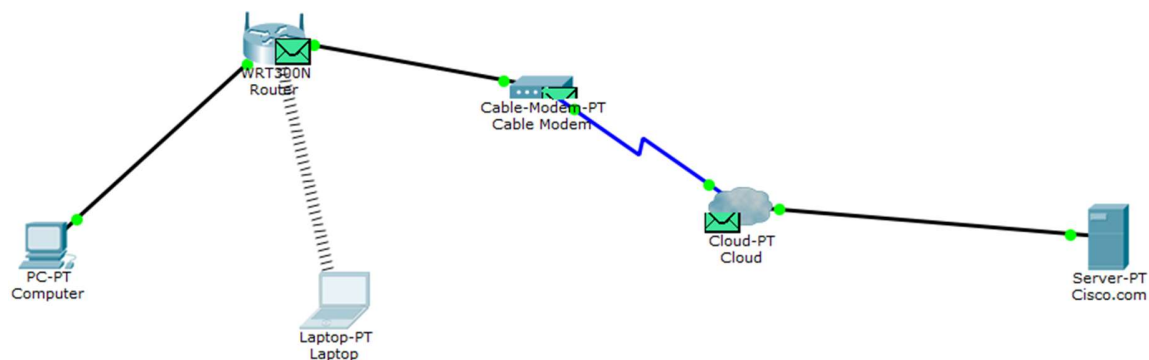
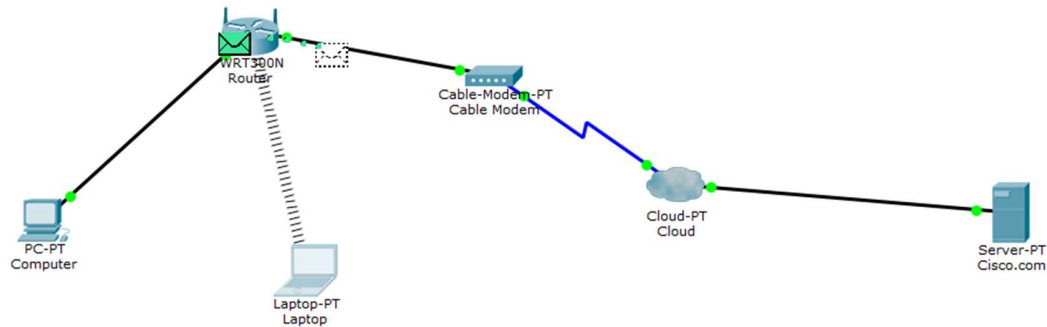
Ping statistics for 208.67.220.220:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 10ms, Average = 6ms

PC>
```

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OUTPUT:



CONCLUSION:

From this experiment, it is concluded that we have successfully understood the various network protocol analyser tools and analyse the network traffics using one of the network protocol analyser tools ie the CISCO PACKET TRACER. And hence, with this experiment, we have achieved Lab Outcome 5 (LO5).