

**ASSUMPTION UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**COMPUTER ENGINEERING**



**CE4224 TELECOMMUNICATION NETWORK LABORATORY**  
**SECTION 641**  
**SEMESTER 2/2022**

**WEEK4**  
**WIRELESS NETWORK CONFIGURATION**

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## Introduction

Wireless network configuration encompasses several potential variances across environments. Even in a complex single site, the network configuration basics required for a successful implementation can vary from one wireless network to another running on the same hardware as part of the overall wireless LAN environment.

To set up automatic wireless network configuration

1. Open Network Connections
2. Right-click Wireless Network Connection, and then click Properties
3. On the Wireless Networks tab, do one of the following:
  - To enable automatic wireless network configuration, select the Use Windows to configure my wireless network settings check box. This check box is selected by default. For information about what happens when you enable automatic wireless network configuration, see Notes.
  - To disable automatic wireless network configuration, clear the Use Windows to configure my wireless network settings check box.
4. To connect to an existing wireless network, do one of the following:
  - Access point (infrastructure)
    - To connect to an existing access point (infrastructure) network, under Available networks, click the network name, and then click Configure.

In Wireless Network Properties, specify the wireless network key (Wired Equivalent Privacy) settings, or, if the network key is automatically provided for you (for example, the key is stored on the wireless network adapter given to you by your administrator), select the The key is provided for me automatically check box. If you are unsure about whether a network key is needed or which settings you need to enter, contact your network administrator or the wireless network adapter manufacturer.

### Important

- If a network does not broadcast its network name, it will not appear under Available networks. To connect to an access point (infrastructure) network that you know is available but that does not appear under Available networks, under Preferred networks, click Add. In Wireless Network Properties, specify the network name (Service Set Identifier) and, if needed, the wireless network key settings.

### Computer-to-computer (ad hoc)

- To connect to an existing computer-to-computer (ad hoc) network, under Available networks, click the network name, and then click Configure.

In Wireless Network Properties, specify the wireless network key (Wired Equivalent Privacy) settings, or, if the network key is automatically provided for you (for example, the key is stored on the wireless network adapter given to you by your administrator), select the The key is provided for me automatically check box. If you are unsure about whether a network key is needed or which settings you need to enter, contact your network administrator or the wireless network adapter manufacturer.

If you want to connect to a computer-to-computer (ad hoc) network and both computer-to-computer and access point (infrastructure) networks are within range of your computer, click Advanced, and then click Computer-to-computer (ad hoc) networks only.

5. To configure a new wireless network connection, click Add, and then do the following:

- In Wireless Network Properties, specify the network name (Service Set Identifier) and, if needed, the wireless network key settings.
- If the network connection that you are configuring is to a computer-to-computer (ad hoc) network, select the This is a computer-to-computer (ad hoc) network; wireless access points are not used check box.

6. To change the order in which connection attempts to preferred networks are made, under Preferred networks, click the wireless network that you want to move to a new position on the list, and then click Move up or move down.

7. To change the wireless network connection settings for a network that is listed in Preferred networks, click the wireless network for which you want to change settings, click Properties, and then change the settings as needed.

8. To remove a wireless network from the list of preferred networks, under Preferred networks, click the wireless network that you want to remove, and then click Remove.

9. To update the list of available networks that are within range of your computer, click Refresh.

10. To automatically connect to available networks that do not appear in the Preferred networks list, click Advanced, and then select the Automatically connect to non-preferred networks check box.

## **Apparatus**

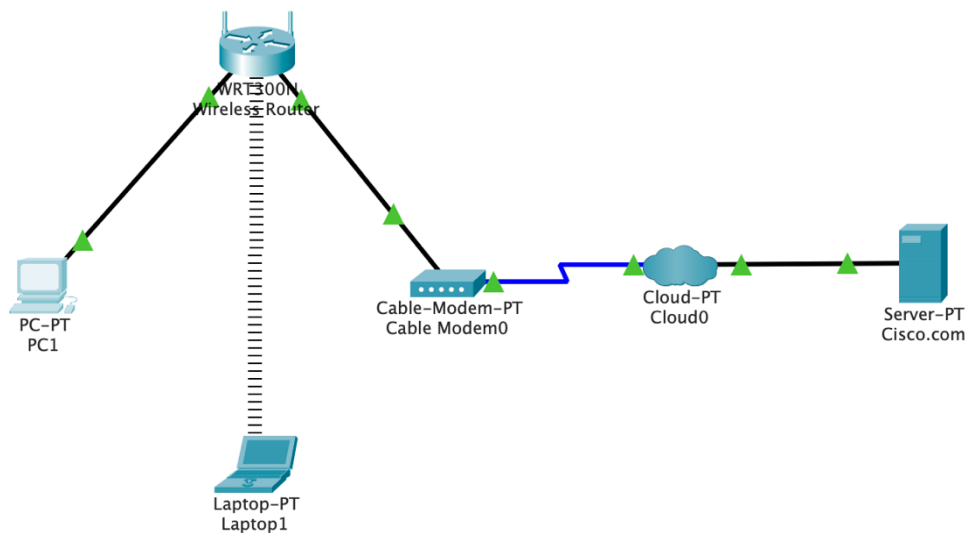
- Laptop
- Cisco Packet Tracer

## Procedure

### - Experiment

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC	Ethernet0	DHCP		192.168.0.1
Wireless Router WRT300N	LAN	192.168.0.1	255.255.255.0	
	Internet	DHCP		
Cisco.com Server	Ethernet0	208.67.220.220	255.255.255.0	
Laptop	Wireless0	DHCP		

### - Configure the network following the given topology



### - Configure the Wireless Router

a. Create the wireless network on the Wireless Router Click on the Wireless Router icon on the Packet Tracer Logicalworkspace 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" as shown in the figure.

Wireless-N Broadband Router

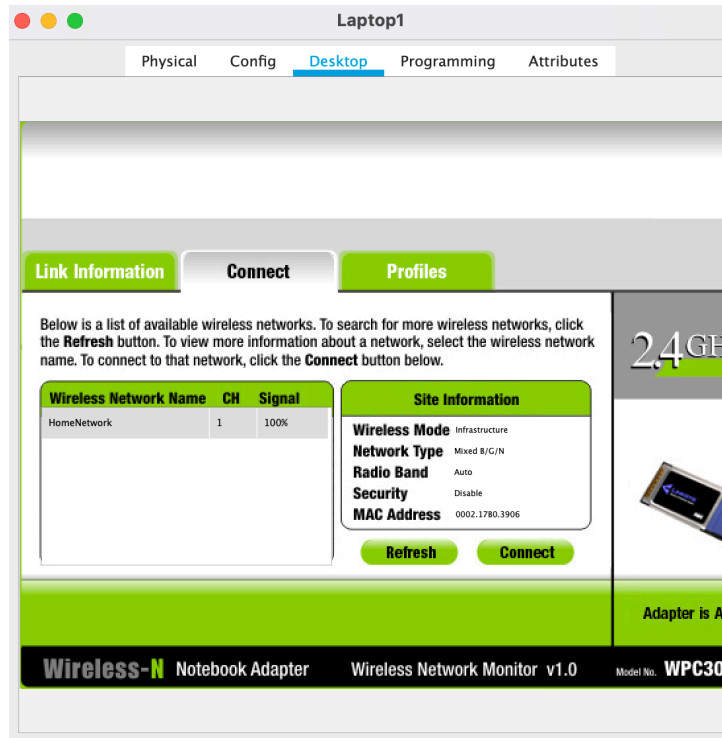
Wireless	Setup	Wireless	Security	Access Restrictions	Applications & Gaming	Wireless-N Br	Admini
Basic Wireless Settings		Wireless Security	Guest Network	Wireless MAC Filter			
<b>Basic Wireless</b>							
Network Mode:		Mixed					
Network Name (SSID):		HomeNetwork					
Radio Band:		Auto					
Wide Channel:		Auto					
Standard Channel:		1 - 2.412GHz					
SSID Broadcast:		<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled					

- b. Configure the Internet connection on the Wireless Router 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.
- c. Click on the Save Settings tab.

Physical		Config	GUI	Attributes
<b>Internet Setup</b>				
Internet Connection type	Automatic Configuration - DHCP			
Optional Settings (required by some internet service providers)	Host Name: Domain Name: MTU: Size: 1500			
<b>Network Setup</b>				
Router IP	IP Address: 192 . 168 . 0 . 1 Subnet Mask: 255.255.255.0			
DHCP Server Settings	DHCP Server: <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled <span>DHCP Reservation</span> Start IP Address: 192.168.0. 100 Maximum number of Users: 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			

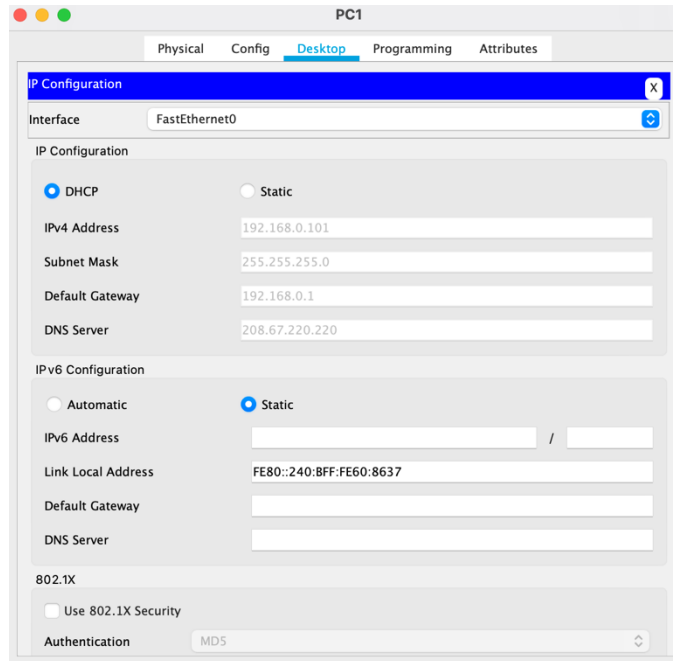
- Configure the Laptop

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 as shown in the figure. Select the network, and click on the Connect tab found below the Site Information.



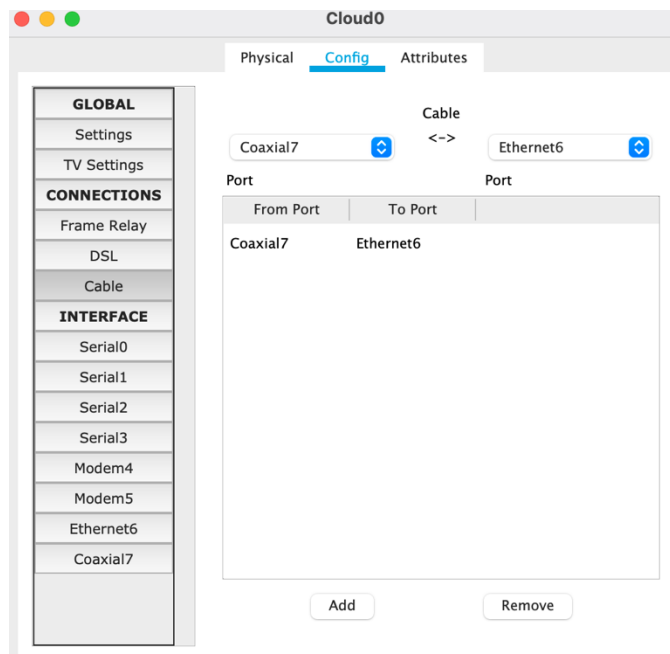
### - Configure the PC

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.



### - Configure the Internet cloud

Click on the Configtab 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 as shown in the figure.



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 as shown in the figure.



- Configure the Cisco.com 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: 50Click Add to add the pool



Cisco.com

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

**DHCP**

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: DHCPpool

Default Gateway: 208.67.220.220

DNS Server: 208.67.220.220

Start IP Address: 208.0.0.0

Subnet Mask: 255.255.255.0

Maximum Number of Users: 50

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
DHCPpool	208.67.220.220	208.67.220.220	208.0.0.0	255.255.255.0	50	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	208.67.220.0	255.255.255.0	255	0.0.0.0	0.0.0.0

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

Cisco.com

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

**DNS**

DNS Service: ☒ On ☐ Off

Resource Records

Name: cisco.com Type: A Record

Address: 208.67.220.220

Add Save Remove

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

DNS Cache

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
- DNS Server: 208.67.220.220

The screenshot shows the Cisco.com configuration window with the 'Config' tab selected. In the left sidebar, 'GLOBAL' is expanded, and 'Settings' is selected. The main panel displays 'Global Settings'. Under 'Gateway/DNS IPv4', 'Static' is selected, and the 'Default Gateway' is set to 208.67.220.1 and the 'DNS Server' is set to 208.67.220.220. The 'Gateway/DNS IPv6' section shows 'Static' selected, but the fields are empty.

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

The screenshot shows the Cisco.com configuration window with the 'Config' tab selected. In the left sidebar, 'INTERFACE' is expanded, and 'FastEthernet0' is selected. The main panel displays 'FastEthernet0' settings. 'Port Status' is 'On', 'Bandwidth' is '10 Mbps' and 'Auto', and 'Duplex' is 'Full Duplex' and 'Auto'. The 'MAC Address' is 00E0.F788.24CD. Under 'IP Configuration', 'Static' is selected, and the 'IPv4 Address' is set to 208.67.220.220 and the 'Subnet Mask' is set to 255.255.255.0. The 'IPv6 Configuration' section shows 'Static' selected, but the fields are empty.

### - Verify Connectivity

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

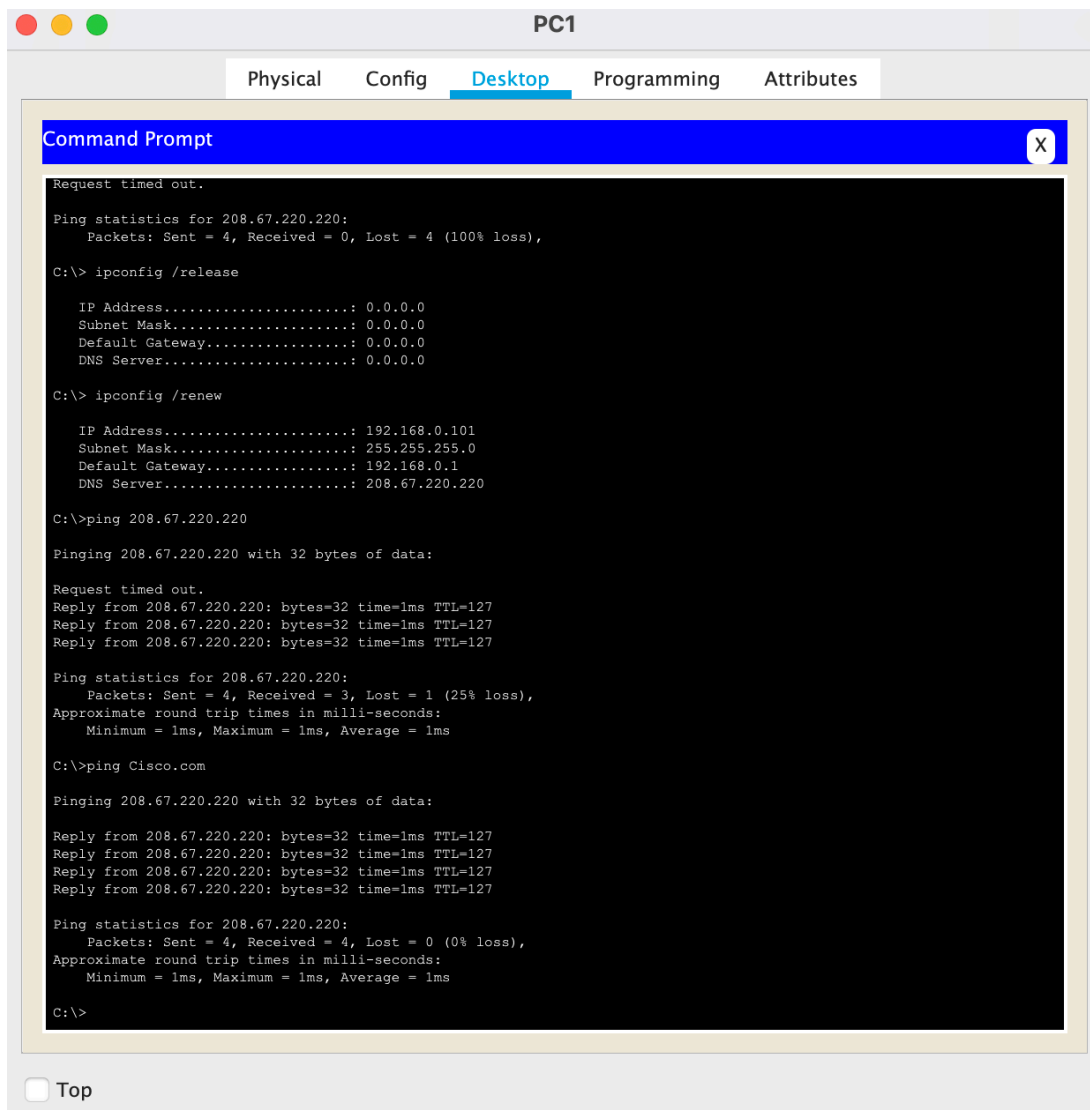
Click on the PC on the Packet Tracer Logical workspace and then select the Desktop tab of the PC configuration window.

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 DNS server address as shown in the figure.

### - Test connectivity to the Cisco.com server from the PC

From the command prompt issuing the command `ping Cisco.com`. It may take a few seconds for the ping to return. Four replies should be received as shown in the figure.



The screenshot shows the PC1 configuration window with the Desktop tab selected. A Command Prompt window is open, displaying the following text:

```
Request timed out.

Ping statistics for 208.67.220.220:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\> 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

C:\> ipconfig /renew

    IP Address. . . . .: 192.168.0.101
    Subnet Mask. . . . .: 255.255.255.0
    Default Gateway. . . . .: 192.168.0.1
    DNS Server. . . . .: 208.67.220.220

C:\> ping 208.67.220.220

Pinging 208.67.220.220 with 32 bytes of data:

Request timed out.
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127

Ping statistics for 208.67.220.220:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\> ping Cisco.com

Pinging 208.67.220.220 with 32 bytes of data:

Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms TTL=127
Reply from 208.67.220.220: bytes=32 time=1ms 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 = 1ms, Average = 1ms

C:\>
```

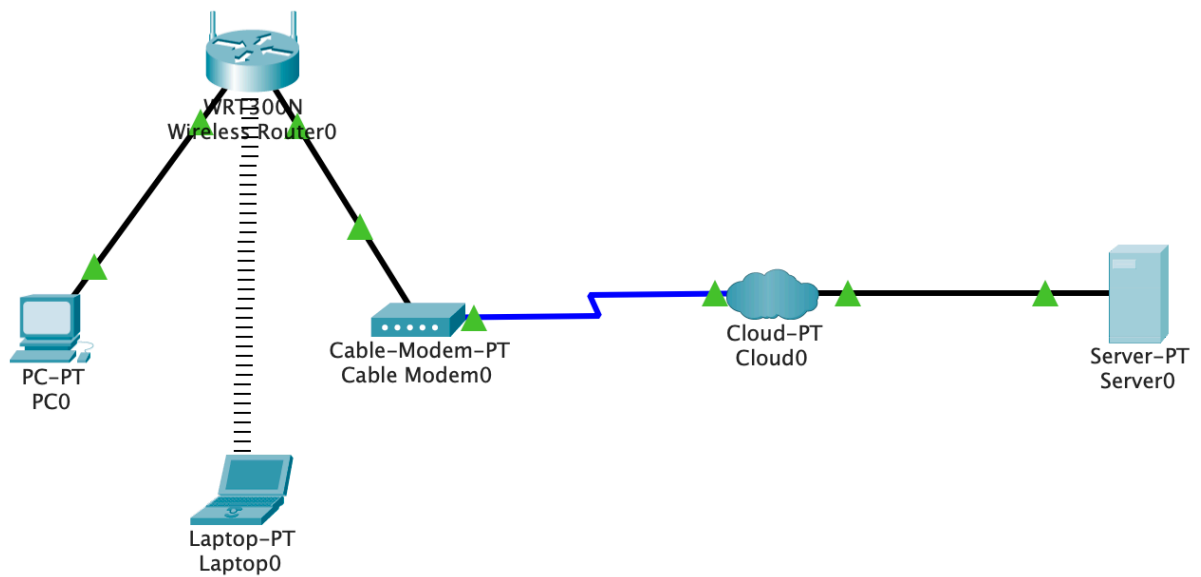
At the bottom left of the window, there is a checkbox labeled "Top" which is currently unchecked.

## Exercise

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC	Ethernet0	DHCP		10.0.0.1
Wireless Router WRT300N	LAN	10.0.0.1	255.255.255.0	
	Internet	DHCP		
Cisco.com	Ethernet0	192.168.0.220	255.255.255.0	
Laptop	Wireless0	DHCP		

- Step 1

Configure the network following the given topology



- Step 2

Set up the network devices by following the information from the addressing table

Basic Wireless	
Network Mode:	Mixed
Network Name (SSID):	Network
Radio Band:	Auto
Wide Channel:	Auto
Standard Channel:	1 - 2.412GHz
SSID Broadcast:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled

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: 10 . 0 . 0 . 1 Subnet Mask: 255.255.255.0
DHCP Server Settings	DHCP Server: <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled DHCP Reservation Start IP Address: 10.0.0. 100 Maximum number of Users: 50 IP Address Range: 10.0.0. 100 - 149 Client Lease Time: 0 minutes (0 means one day) Static DNS 1: 192 . 168 . 0 . 220

- Step 3  
select the DHCP radio button

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface FastEthernet0 [v]

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 10.0.0.102

Subnet Mask 255.255.255.0

Default Gateway 10.0.0.1

DNS Server 192.168.0.220

IPv6 Configuration

- Step 4  
select the Connect tab. The wireless network “Network” should be visible in the list of wireless networks.

Link Information **Connect** Profiles

Below is a list of available wireless networks. To search for more wireless networks, click the **Refresh** button. To view more information about a network, select the wireless network name. To connect to that network, click the **Connect** button below.

Wireless Network Name	CH	Signal
Network	1	100%

**Site Information**

**Wireless Mode** Infrastructure

**Network Type** Mixed B/G/N

**Radio Band** Auto

**Security** Disable

**MAC Address** 0001.438D.6806

**Refresh** **Connect**

Adapter is A

**Wireless-N** Notebook Adapter Wireless Network Monitor v1.0 Model No. **WPC30**

- Step 5

Configure the Internet cloud

Cloud0

PhysicalConfigAttributes

GLOBAL

Settings

TV Settings

CONNECTIONS

Frame Relay

Ethernet6

Provider Network

☒ Cable

☐ DSL

Cloud0

PhysicalConfigAttributes

Cable

Coaxial7

<->

Ethernet6

Port

Port

From Port	To Port
Coaxial7	Ethernet6

- Step 6  
Configure the Cisco.com server

**DHCP**

Interface FastEthernet0 Service ☒ On ☐ Off

Pool Name serverPool

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

Start IP Address : 192 168 0 0

Subnet Mask: 255 255 255 0

Maximum Number of Users : 255

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max Users	TFTP Server	WLC Address
DHCPpool	192...	192...	192...	255...	...	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192...	255...	...	0.0.0.0	0.0.0.0

**DNS**

DNS Service ☒ On ☐ Off

Resource Records

Name  Type A Record

Address

Add Save Remove

ID	Name	Type	Detail
0	cisco.com	A Record	192.168.0.2...

DNS Cache

**Cisco.com**

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name Cisco.com

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway 208.67.220.1

DNS Server 208.67.220.220

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

**Cisco.com**

Physical Config Services Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

FastEthernet0

Port Status ☒ On

Bandwidth 100 Mbps 10 Mbps ☒ Auto

Duplex Half Duplex Full Duplex ☒ Auto

MAC Address 00E0.F788.24CD

IP Configuration

☐ DHCP

☒ Static

IPv4 Address 208.67.220.220

Subnet Mask 255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

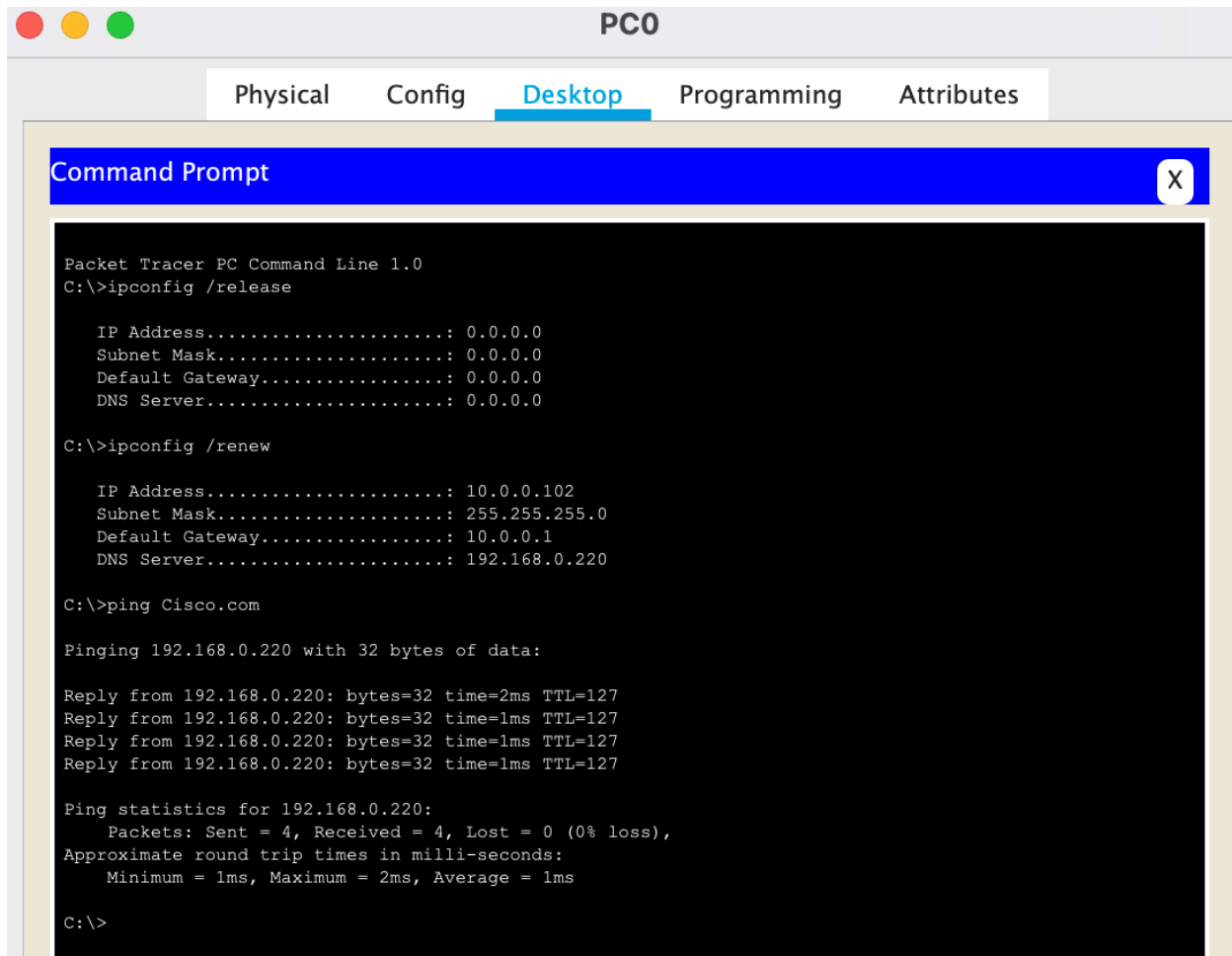
IPv6 Address  /

Link Local Address: FE80::2E0:F7FF:FE88:24CD



- Step 7

Test the connection



```
Packet Tracer PC Command Line 1.0
C:\>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

C:\>ipconfig /renew

IP Address.....: 10.0.0.102
Subnet Mask.....: 255.255.255.0
Default Gateway...: 10.0.0.1
DNS Server.....: 192.168.0.220

C:\>ping Cisco.com

Pinging 192.168.0.220 with 32 bytes of data:

Reply from 192.168.0.220: bytes=32 time=2ms TTL=127
Reply from 192.168.0.220: bytes=32 time=1ms TTL=127
Reply from 192.168.0.220: bytes=32 time=1ms TTL=127
Reply from 192.168.0.220: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.0.220:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>
```

## Conclusion

In this week I'm not come to class but lucky that Arjan gave the pdf file in teams, and I have followed it. In this experiment. I have learned about wireless networks, and I also learn about the DHCP and DNS. The DHCP is will automatically understand the IP address on advice. The DNS is like the translator. After I followed the lecture and ask my friends for practice question, it makes me more understand and more get used to, but there are some parts that I don't know like I didn't change the modules of laptop so I cannot connect it at first.