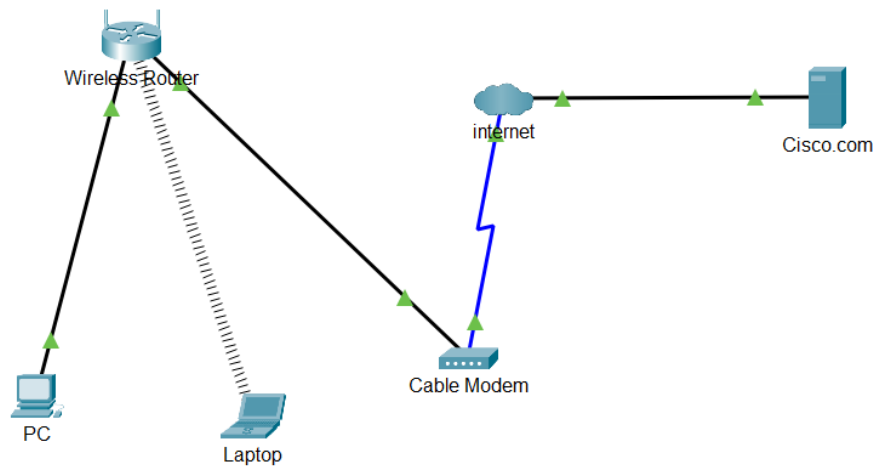
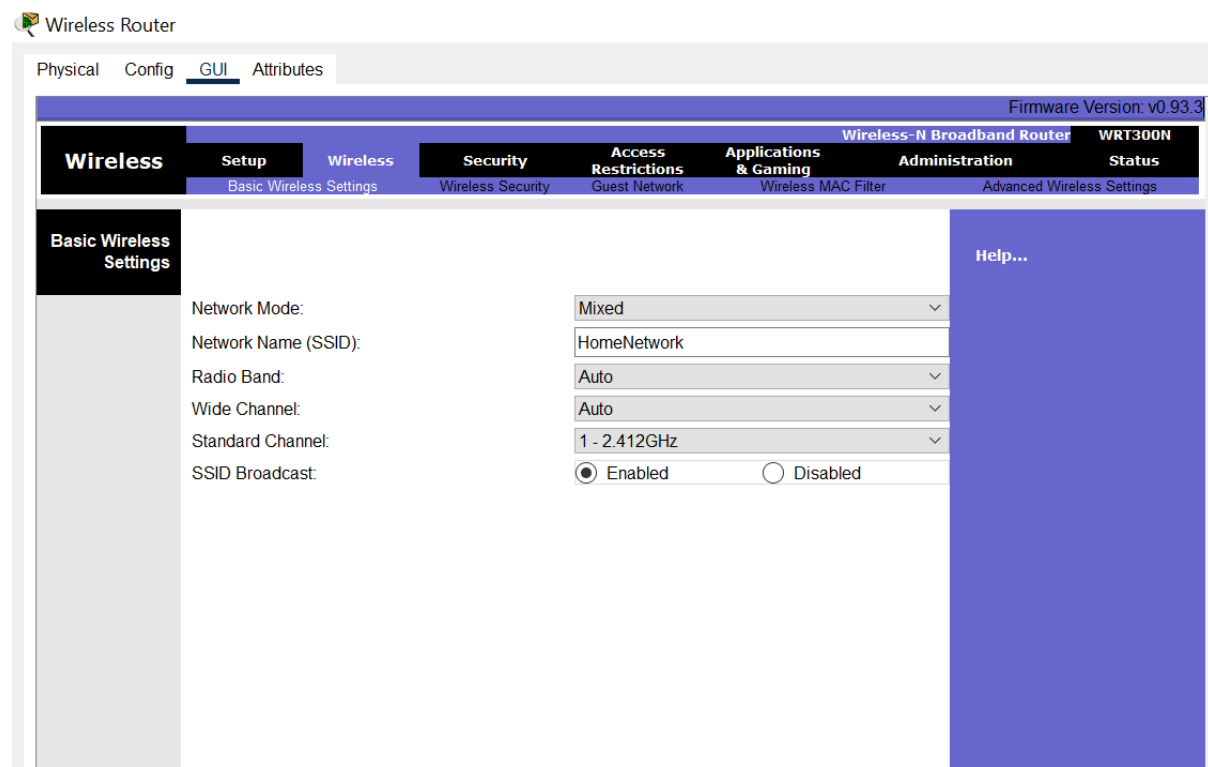


PART 1 – BUILDING A SIMPLE NETWORK



Part 2

A.



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28/02/2022

NETWORKS AND DATA COMMUNICATION

B.

Wireless Router

Physical Config **GUI** Attributes

Firmware Version: v0.93.3

Setup Setup Wireless Security Access Restrictions Applications & Gaming Administration Status

Basic Setup DDNS MAC Address Clone 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: . . .

Subnet Mask:

DHCP Server Settings

DHCP Server: ☒ Enabled ☐ Disabled

Start IP Address: 192.168.0.

Maximum number of Users:

IP Address Range: 192.168.0. 1 - 1

Client Lease Time: minutes (0 means one day)

Static DNS 1: . . .

Static DNS 2: . . .

Static DNS 3: . . .


WINS: . . .

Help...

STEP 2

A.

NETWORKS AND DATA COMMUNICATION

 Laptop

Physical

Config

Desktop

Programming

Attributes

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
HomeNetwork	1	100%

<

>

Site Information

Wireless Mode Infrastructure

Network Type Mixed B/G/N

Radio Band Auto


Security Disable

MAC Address 0050.0F07.6706

Refresh

Connect

2.4GHz



Adapter is Active

Wireless-N Notebook Adapter

Wireless Network Monitor v1.0

Model No. WPC300N

☐ Top

NETWORKS AND DATA COMMUNICATION

PC

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static DHCP failed. APIPA is being used.

IPv4 Address 169.254.18.90

Subnet Mask 255.255.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::240:BFF:FEC1:125A

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

STEP 3

NETWORKS AND DATA COMMUNICATION

PC

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface: Wireless0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 169.254.44.126

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::201:C7FF:FEAB:2C7E

Default Gateway:

DNS Server:

☐ Top



Physical Config Desktop Programming Attributes

Command Prompt X

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig /all

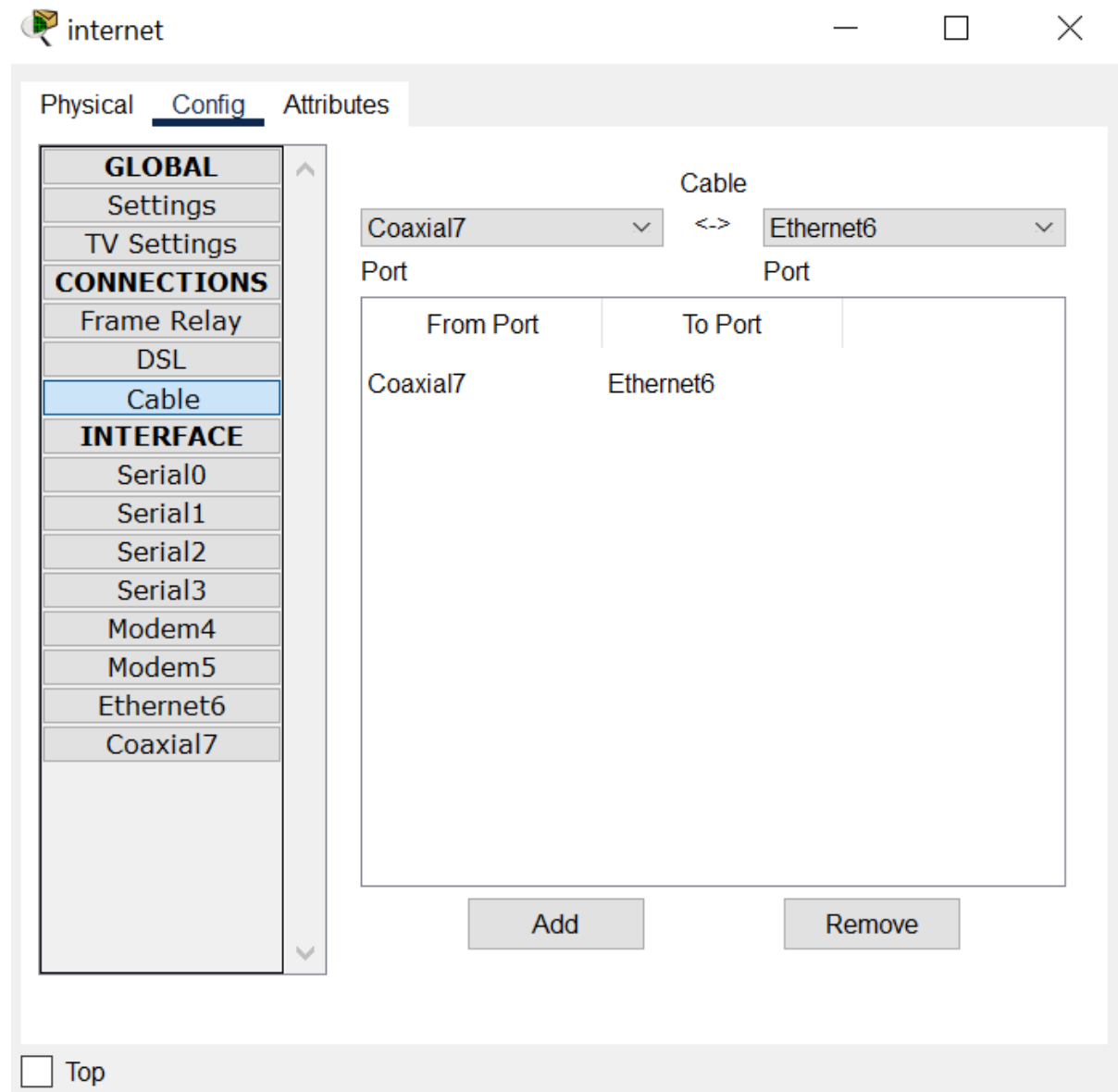
FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Physical Address.....: 0040.0BC1.125A
    Link-local IPv6 Address.....: FE80::240:BFF:FEC1:125A
    IPv6 Address.....: ::
    Autoconfiguration IP Address....: 169.254.18.90
    Subnet Mask.....: 255.255.0.0
    Default Gateway.....: ::
                                0.0.0.0
    DHCP Servers.....: 192.168.0.1
    DHCPv6 IAID.....:
    DHCPv6 Client DUID.....: 00-01-00-01-A7-02-E1-
B3-00-40-0B-C1-12-5A
    DNS Servers.....: ::
                                0.0.0.0

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Physical Address.....: 0001.4322.BE66
    Link-local IPv6 Address.....: ::
--More-- |
```

Top



STEP 5

A.

NETWORKS AND DATA COMMUNICATION

Server

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

67

220

1

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	WL Addr
DHCPpool	208.67....	208.67....	208.67....	255.255...	50	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	512	0.0.0.0	0.0.0.0

☐ Top

B.

NETWORKS AND DATA COMMUNICATION

Server

Physical

Config

Services

Desktop

Programming

Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DNS

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type

A Record

Address

Add

Save


Remove

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

DNS Cache

☐ Top

NETWORKS AND DATA COMMUNICATION

 Cisco.com

— □ ×

Physical Config Services Desktop Programming Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

☐ Top

Server

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 0060.70DB.29EA

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::260:70FF:FEDB:29EA

☐ Top

```
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.....: 192.168.0.102
Subnet Mask.....: 255.255.255.0
Default Gateway...: 192.168.0.1
DNS Server.....: 208.67.220.220
```

```
C:\>
```

NETWORKS AND DATA COMMUNICATION

```
C:\>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=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 = 10ms, Average = 3ms

C:\>|
```

NETWORKS AND DATA COMMUNICATION

```
C:\>
IP Address.....: 192.168.0.102
Subnet Mask.....: 255.255.255.0
Default Gateway...: 192.168.0.1
DNS Server.....: 208.67.220.220

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.....: 192.168.0.102
Subnet Mask.....: 255.255.255.0
Default Gateway...: 192.168.0.1
DNS Server.....: 208.67.220.220

C:\>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=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 = 10ms, Average = 3ms

C:\>|
```

PART 2

1. Wireless router, Cable modem, Internet

2a. The copper straight-through cable is used to connect the computer to the wireless router because it is able to connect non-similar devices or unlike devices.

b. The crossover cable connects devices of the same type and it is used in the connection of the wireless router to cable modem. The straight-through cable has the ability to connect like devices (2 hubs or 2 switches)

c. Coaxial cable to connect the Cable Modem to the internet cloud because it is able to carry high frequency or broadband signals. It can carry data, video, voice over the same wire.

NETWORKS AND DATA COMMUNICATION

d. Copper straight through cable is used in a LAN to connects a computer to a network device which are unlike devices. In this case, it connects the internet cloud (network device) to the Cisco.com server(computer). It provides connection that allows one end to communicate at any given moment.

3. We could have used a wired medium to connect the laptop to the router instead of the wireless medium.

4. DHCP is Dynamic Host Configuration Protocol is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

A DHCP server should be used to enable the configuration of wireless router because it simplifies the management of IP addresses on networks. No two hosts on a network should have the same IP address, and configuring them manually may lead to errors.

5. The ipconfig command stands for Internet Protocol Configuration. It is a command-line application that displays all the current TCP/IP (Transmission Control Protocol/Internet Protocol) network configuration, refreshes the DHCP (Dynamic Host Configuration Protocol) and DNS (Domain Name Server). It also displays IP address, subnet mask, and default gateway for all adapters.

6. DSL (Digital Subscriber Line) is a modem technology that uses existing telephone lines to transport high-bandwidth data, such as multimedia and video, to service subscribers. DSL can be used when the user wants more secure, good, and reliant speed at a cheaper cost and is widely used. It should be used when users have to transfer large files or when using heavily data applications.

On the other hand, *Cable* internet uses existing cable television to transmit digital data. Cable is faster than DSL due to the use of more bandwidth and can be used if a user's focus/consideration is on speed. It is more expensive than DSL.

7. A static IP means that the IP does not change while a DHCP IP is dynamically allocated to the device when they join the network and it changes over time. Static IP's are manually assigned while DHCP IP are automatically assigned by the DHCP server.

8. Gateway: It is defined as a network entity that allows a network to interface with another network with different protocols

B. Router: They select paths for data packets to cross networks and reach their destinations and do this by connecting with different networks and forwarding data from network to network — including LANs, WANS or autonomous systems, which are the large networks that make up the Internet.

C. Switch: A network switch connects devices within a network and forwards data packets to and from those devices. A switch forwards the packets/data to a specific device. Network switches can operate at either OSI layer 2 (the data link layer) or layer 3 (the network layer). Layer 2 switches forward data based on the

NETWORKS AND DATA COMMUNICATION

destination MAC address (see below for definition), while layer 3 switches forward data based on the destination IP address. Some switches can do both.

D. Firewall: is a network security device that monitors, and filters incoming and outgoing network traffic based on an organization's previously established security policies.

E. DNS: The Domain Name System (DNS) is a hierarchical naming system that allows communication across devices on a network. Most commonly, it translates human-readable domain names (like bluecatnetworks.com) to computer-friendly Internet Protocol (IP) addresses (like 104.239. 197.100)