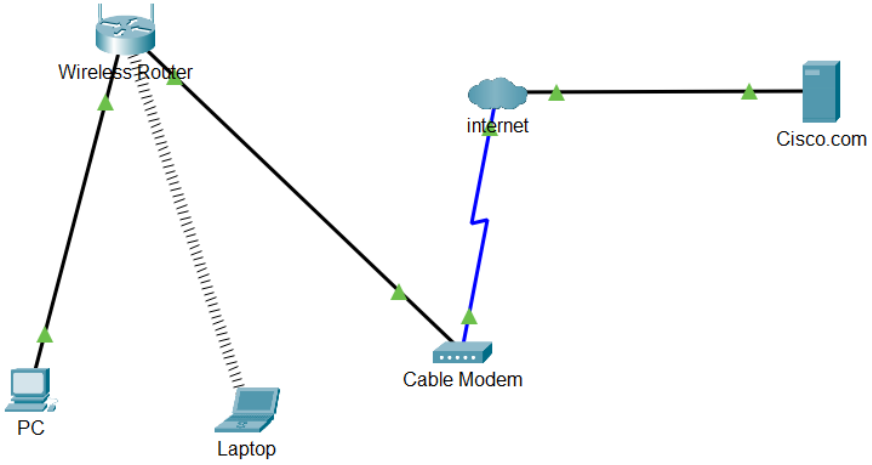
HEPHZIBAH U. EMEREOLE MR. FRANCIS GATSI | SIMON SUUK
65562022 28/02/2022

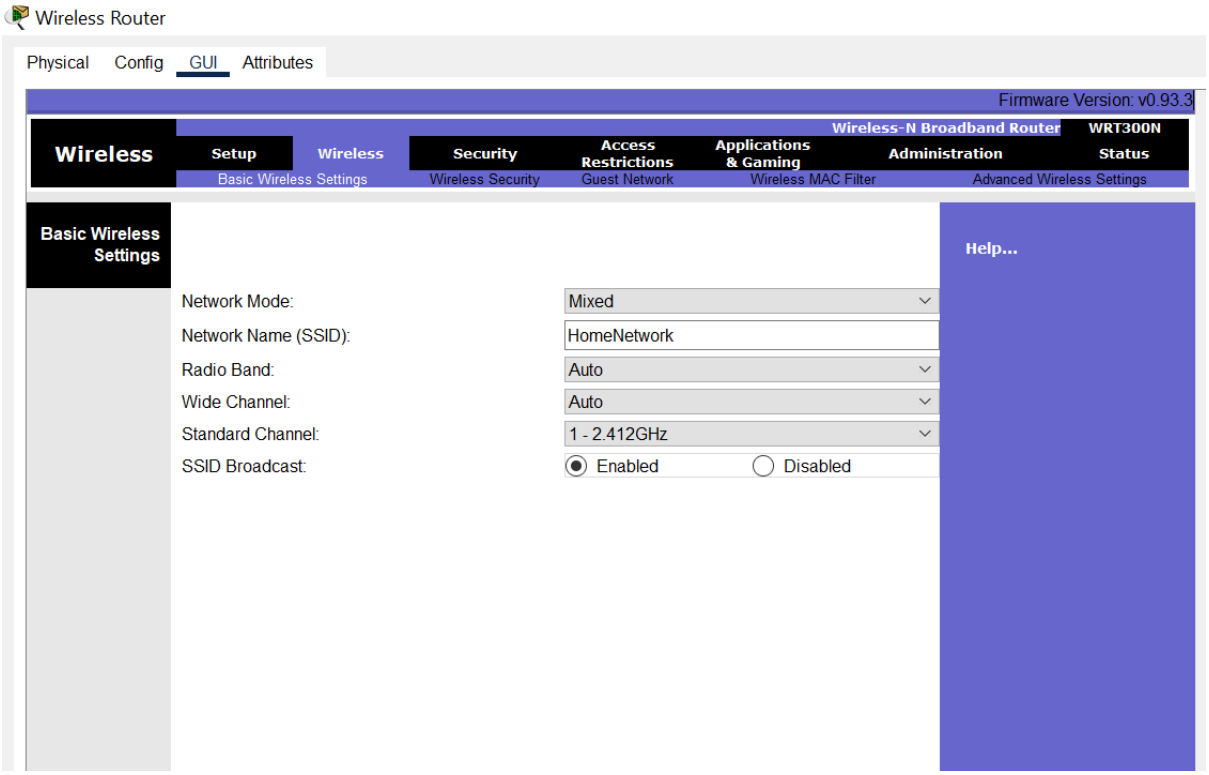
NETWORKS AND DATA COMMUNICATION

PART 1 – BUILDING A SIMPLE NETWORK



Part 2

A.



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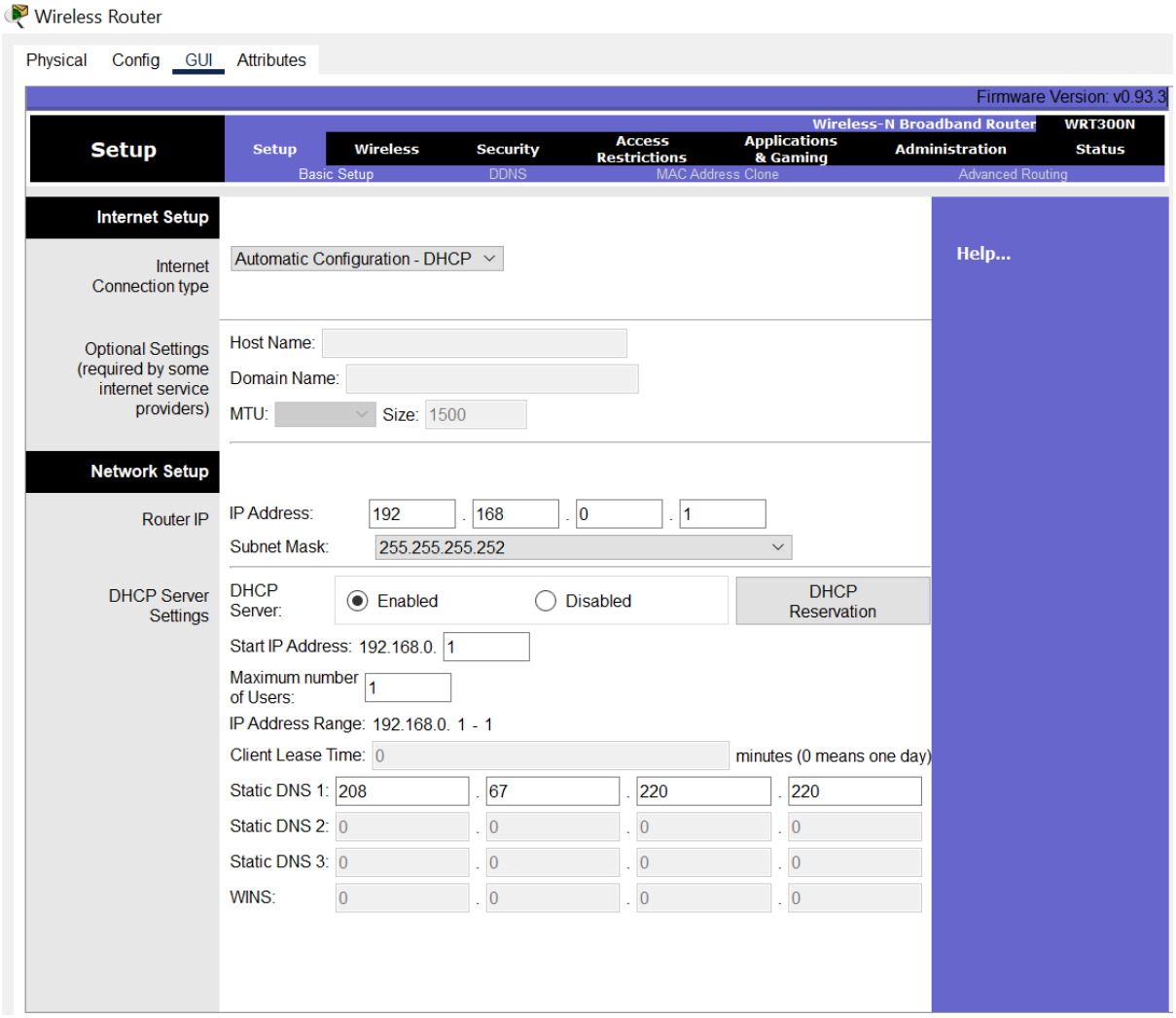
B.



STEP 2

A.

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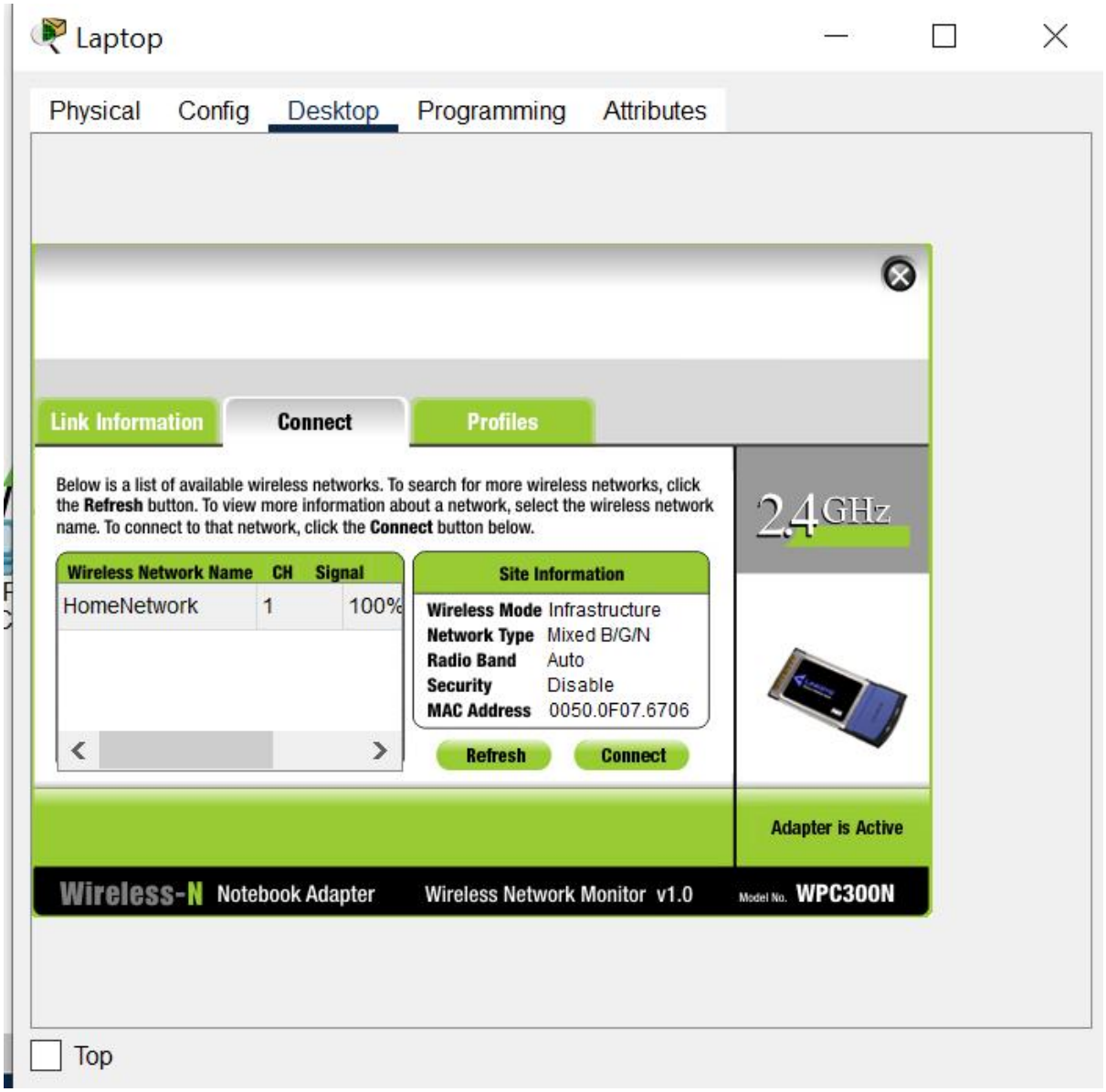

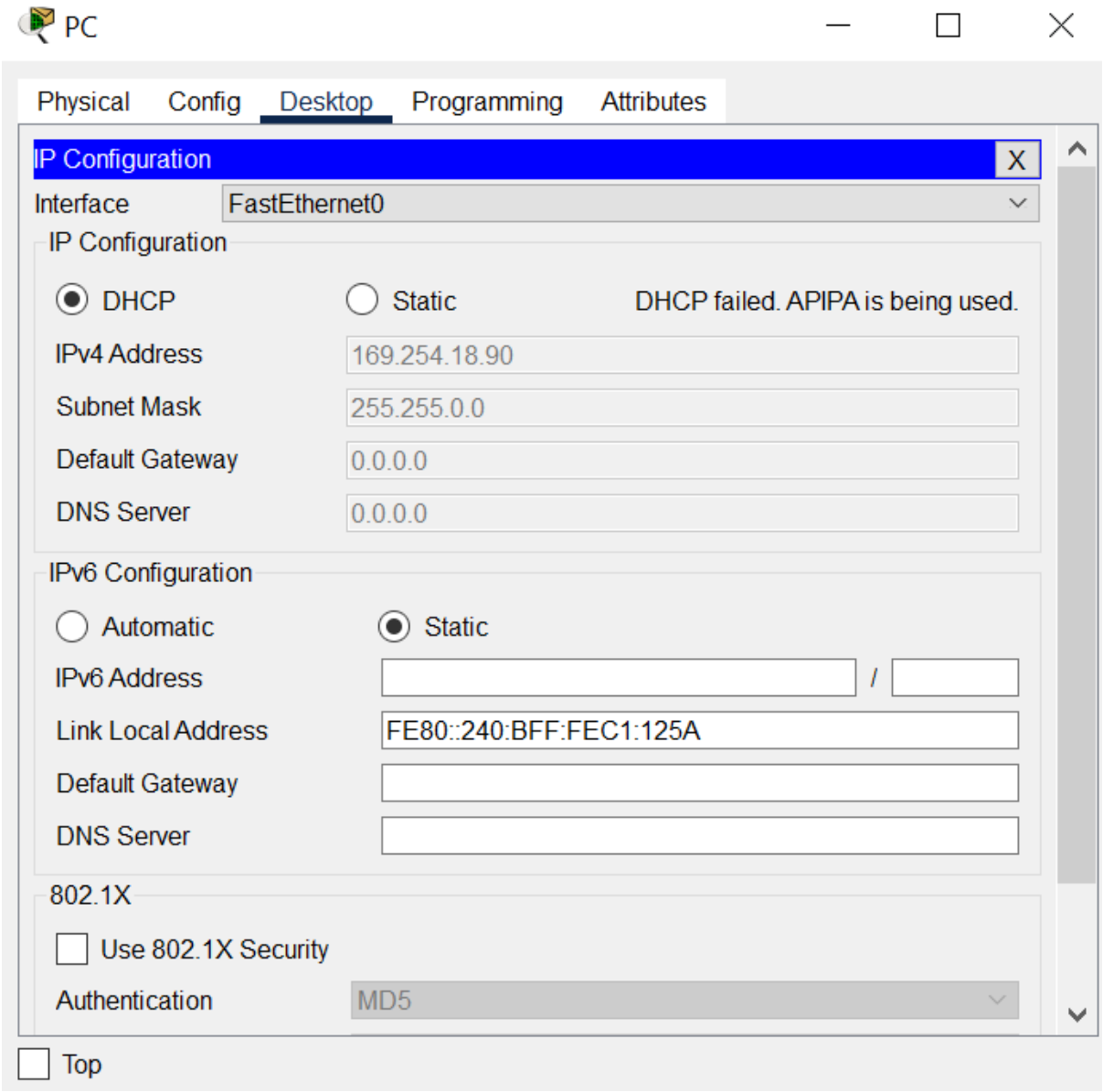
PC
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP failed. APIPA is being used.
IPv4 Address
169.254.18.90
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::240:BFF:FEC1:125A
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Top

STEP 3

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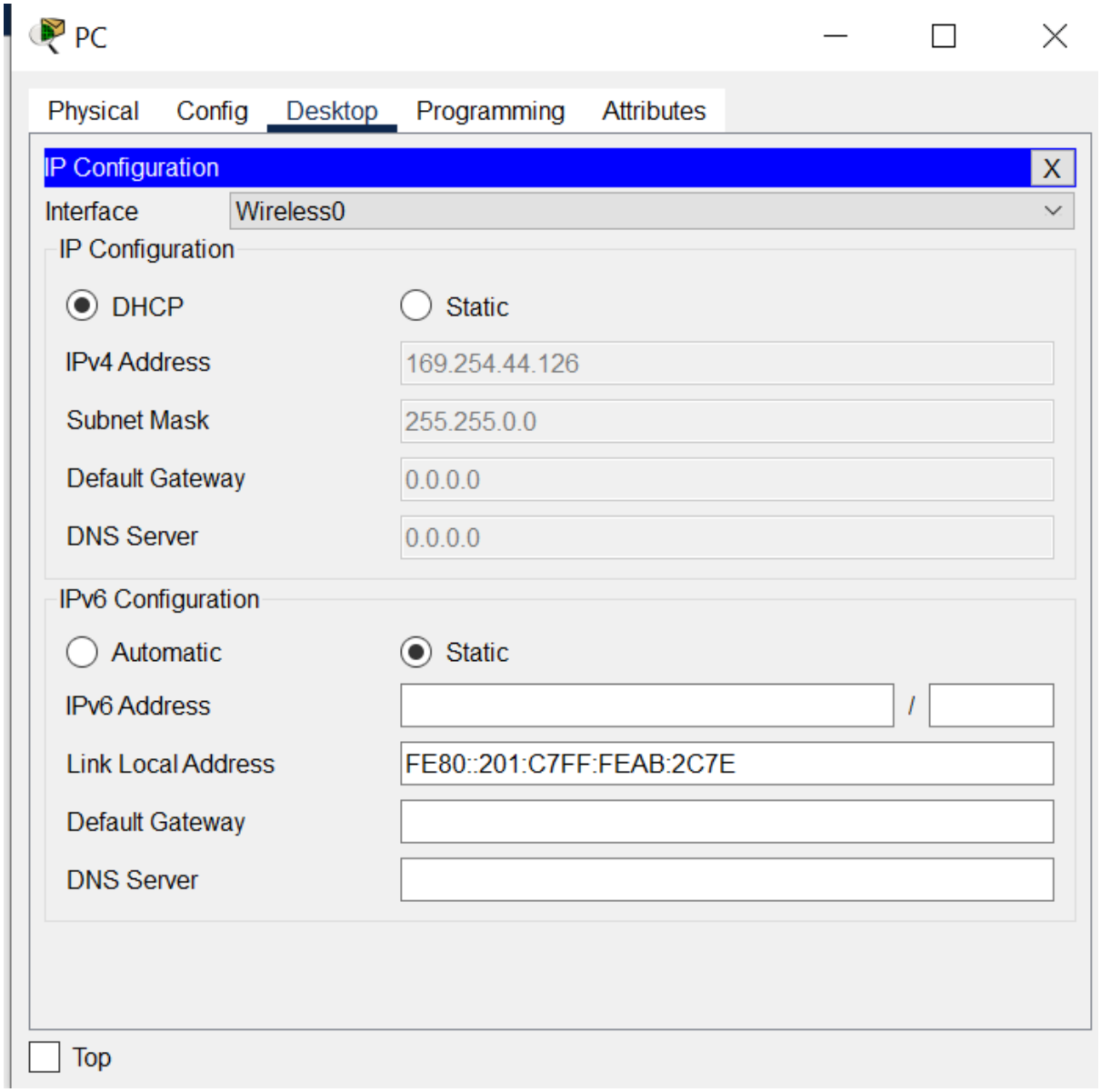
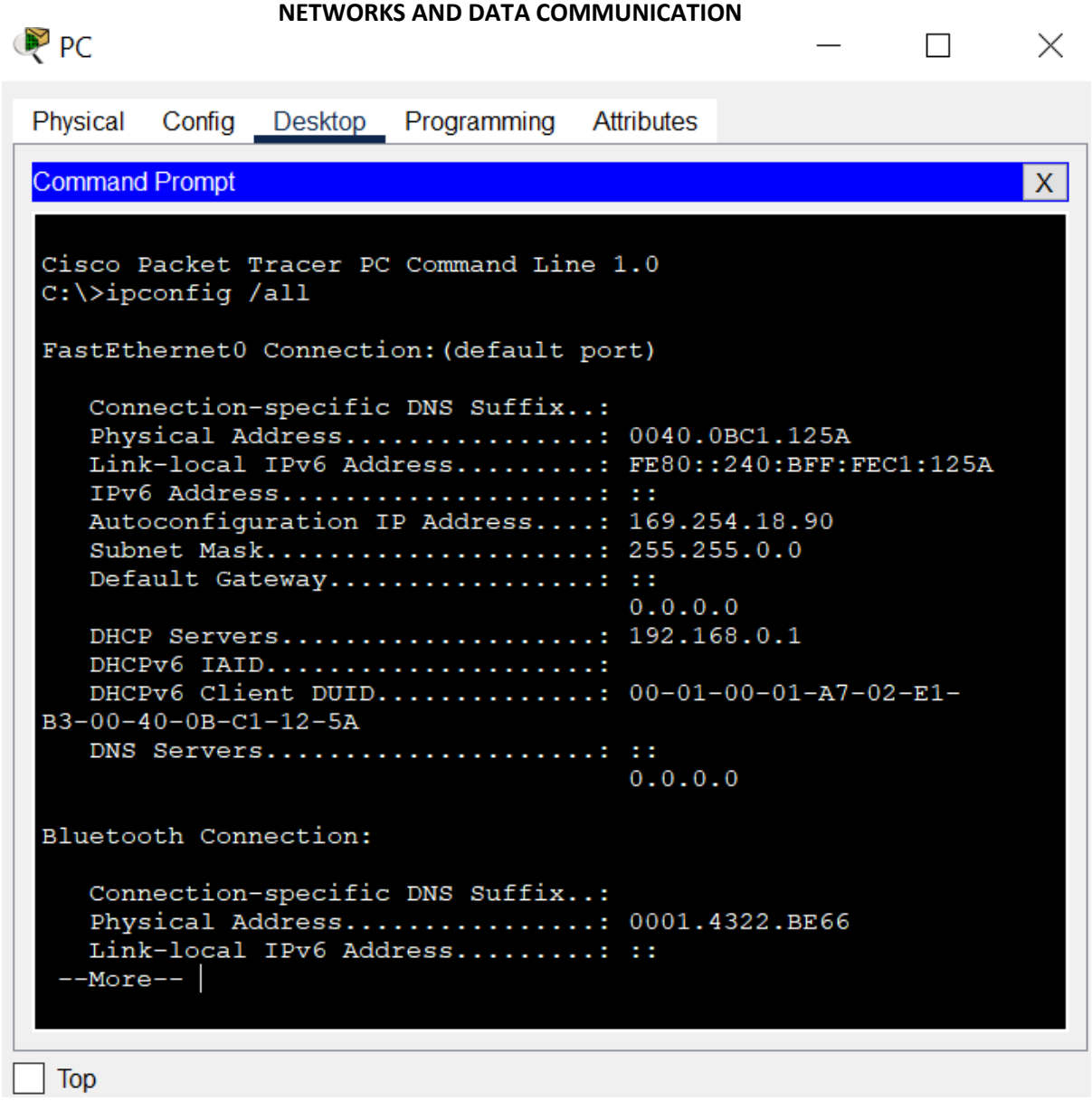
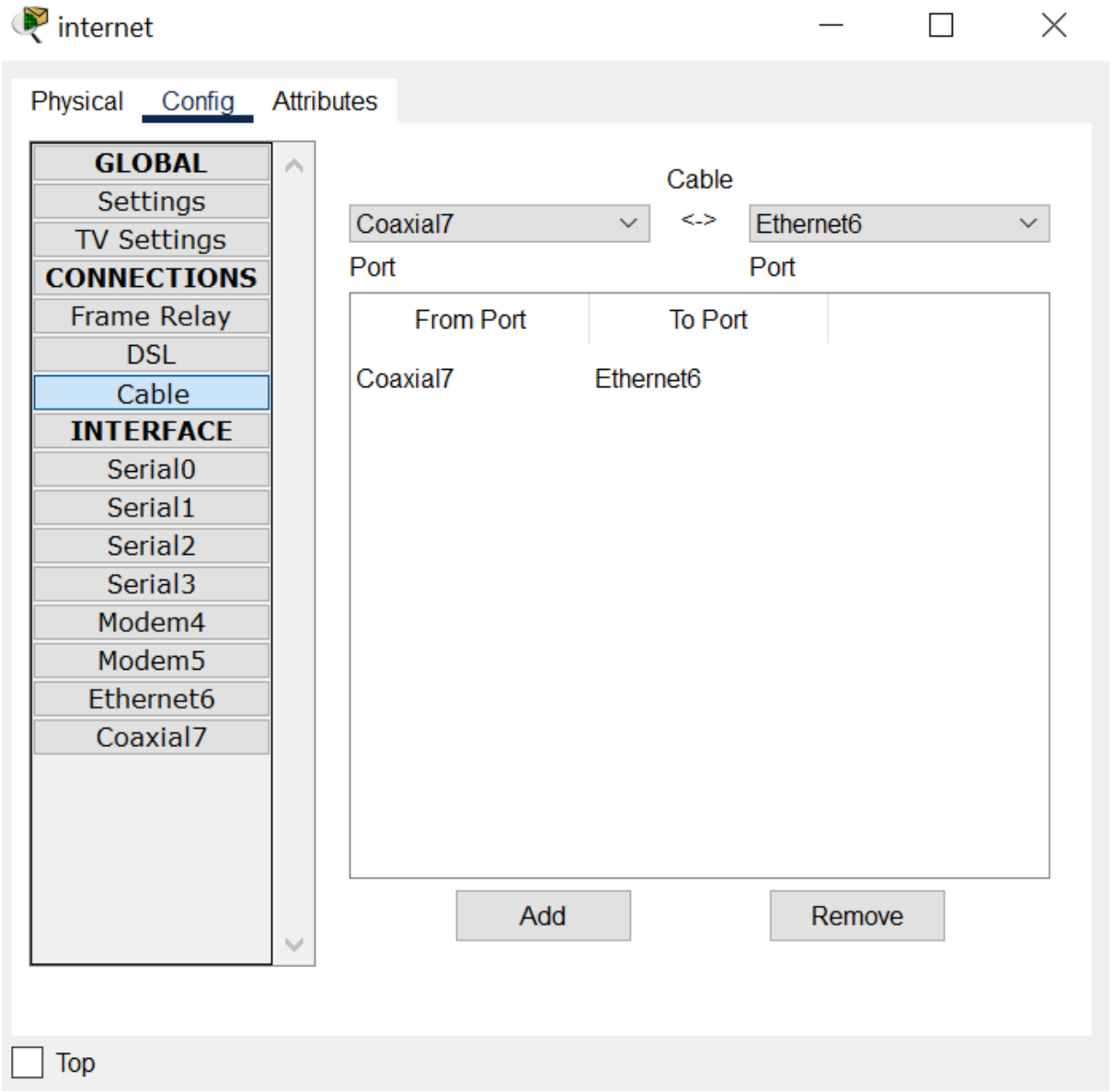



PC
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig /all
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Physical Address.....: 0040.0BC1.125A
Link-local IPv6 Address.....: FE80::240:BFF:FEC1:125A
IPv6 Address.....: ::
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


internet
Physical
Config
Attributes
GLOBAL
Settings
TV Settings
CONNECTIONS
Frame Relay
DSL
Cable
INTERFACE
Serial0
Serial1
Serial2
Serial3
Modem4
Modem5
Ethernet6
Coaxial7
Cable
Coaxial7
<->
Ethernet6
Port
Port
From Port
To Port
Coaxial7
Ethernet6
Add
Remove
Top

STEP 5

A.

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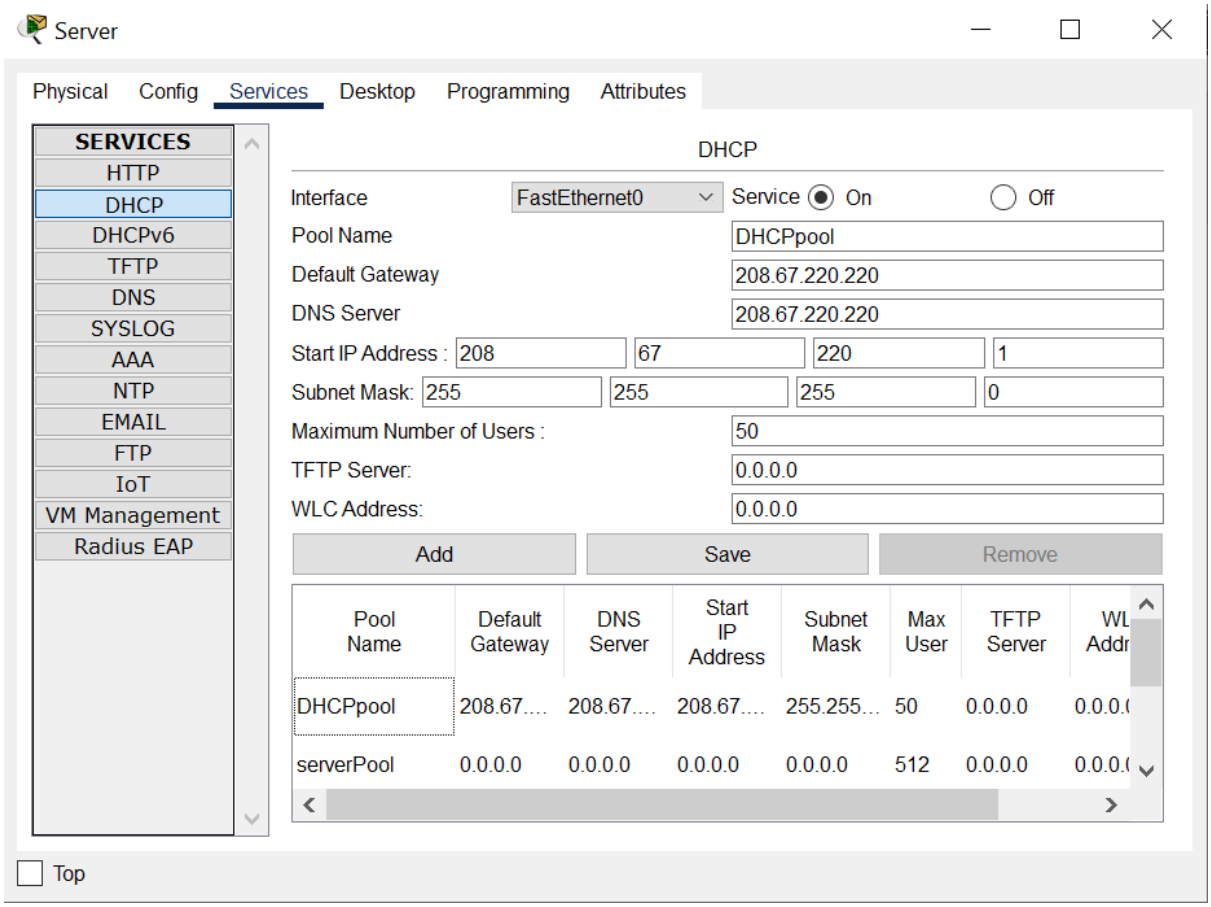

B.

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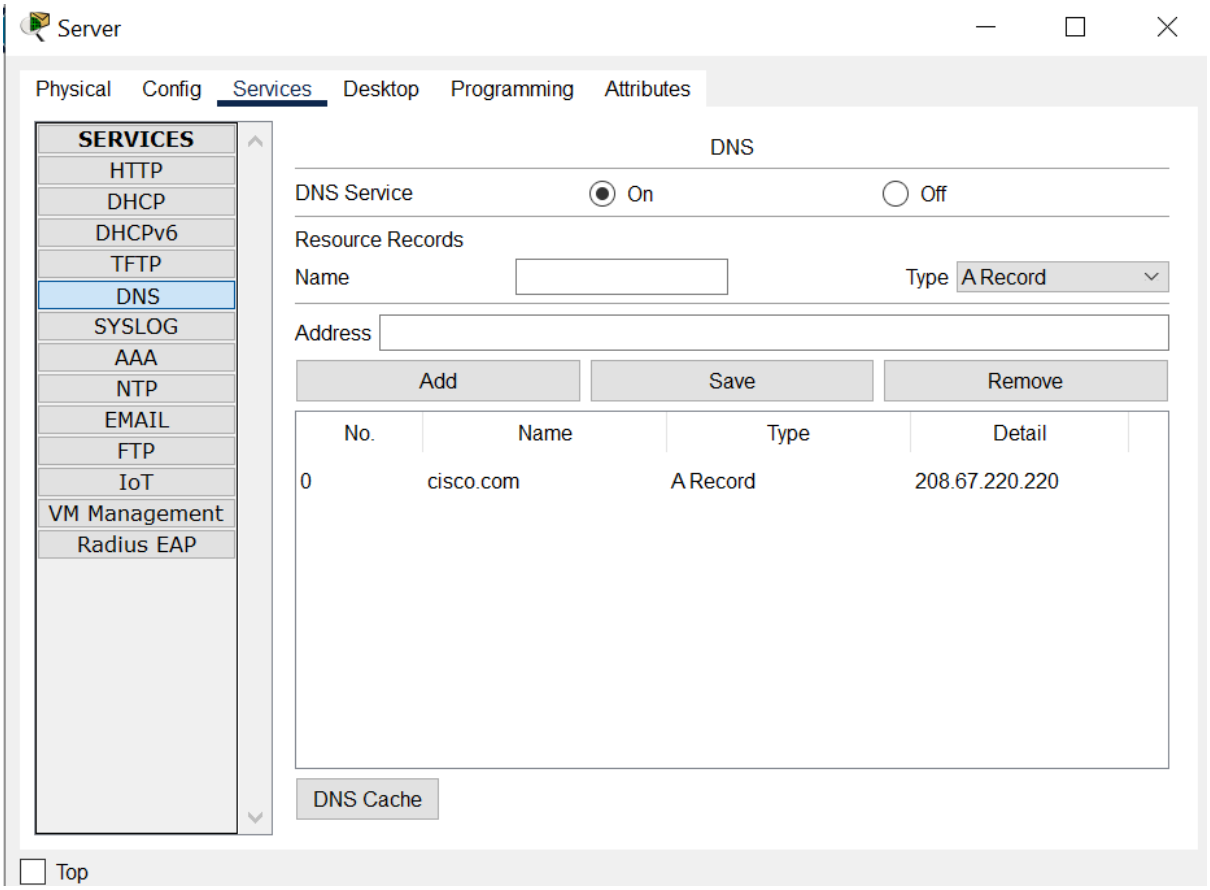
NETWORKS AND DATA COMMUNICATION



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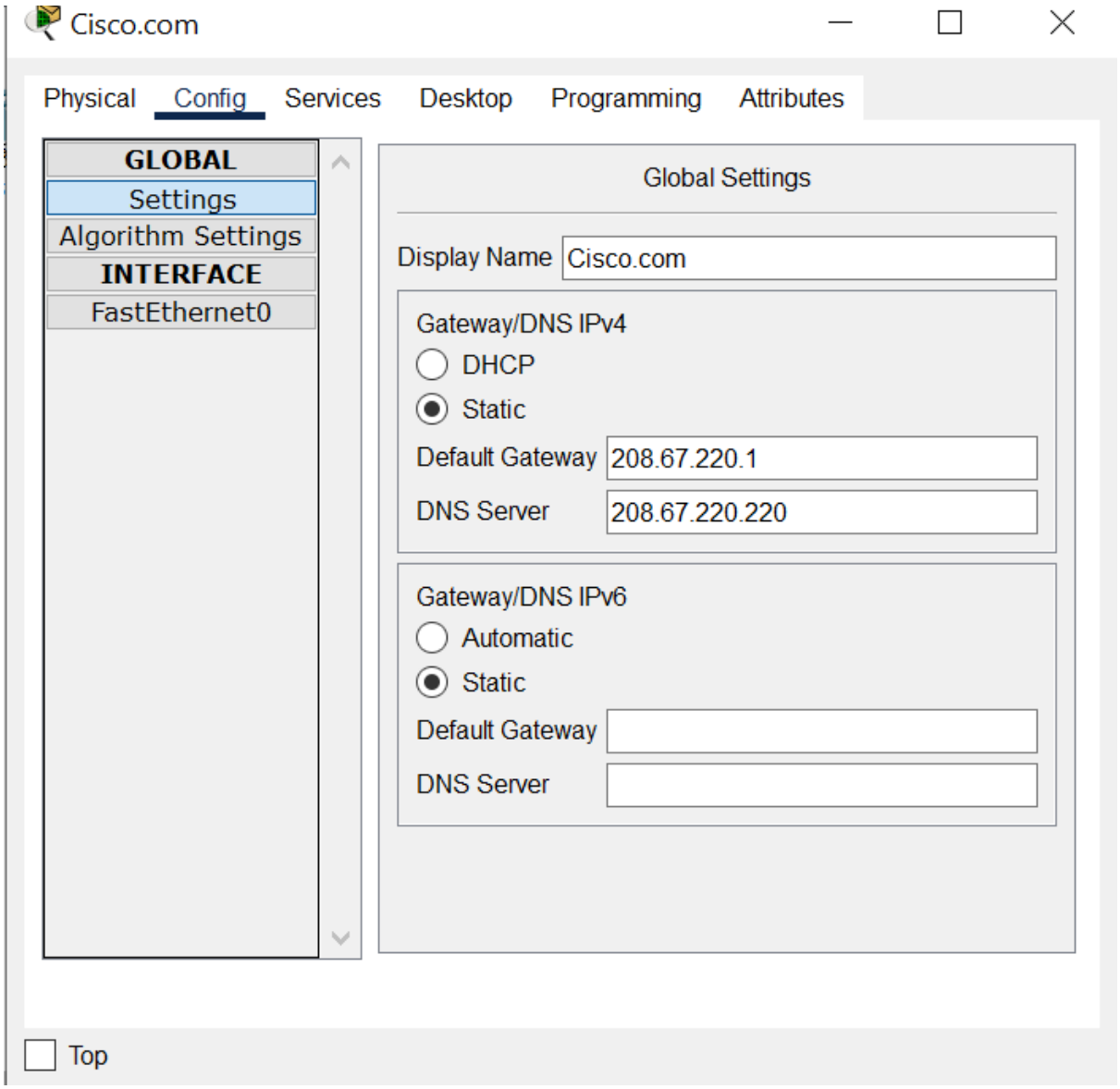

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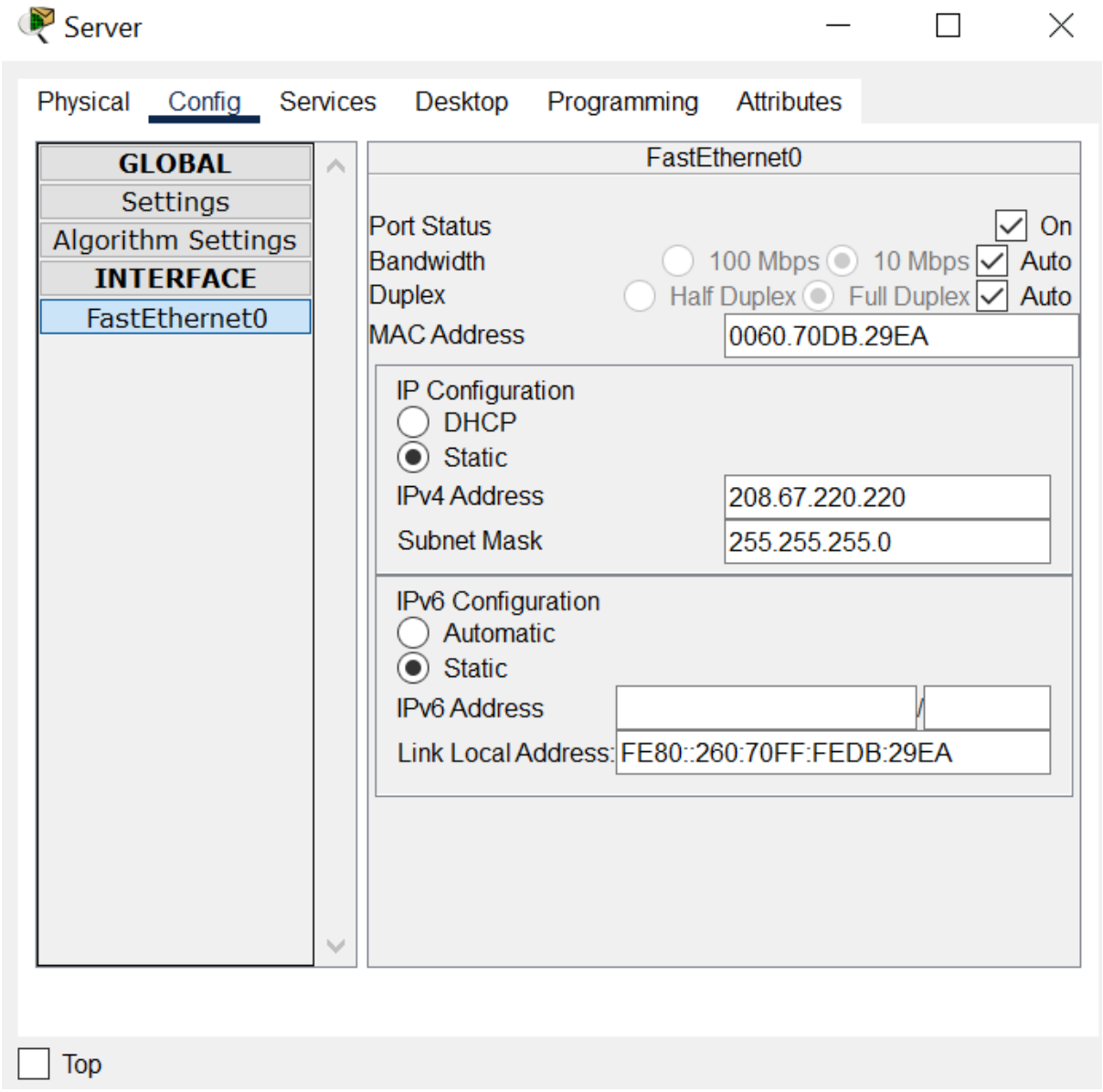


```
C:\>ipconfig /release

   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:\>
```

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```
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:\>
```

```
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.

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 to 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

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)