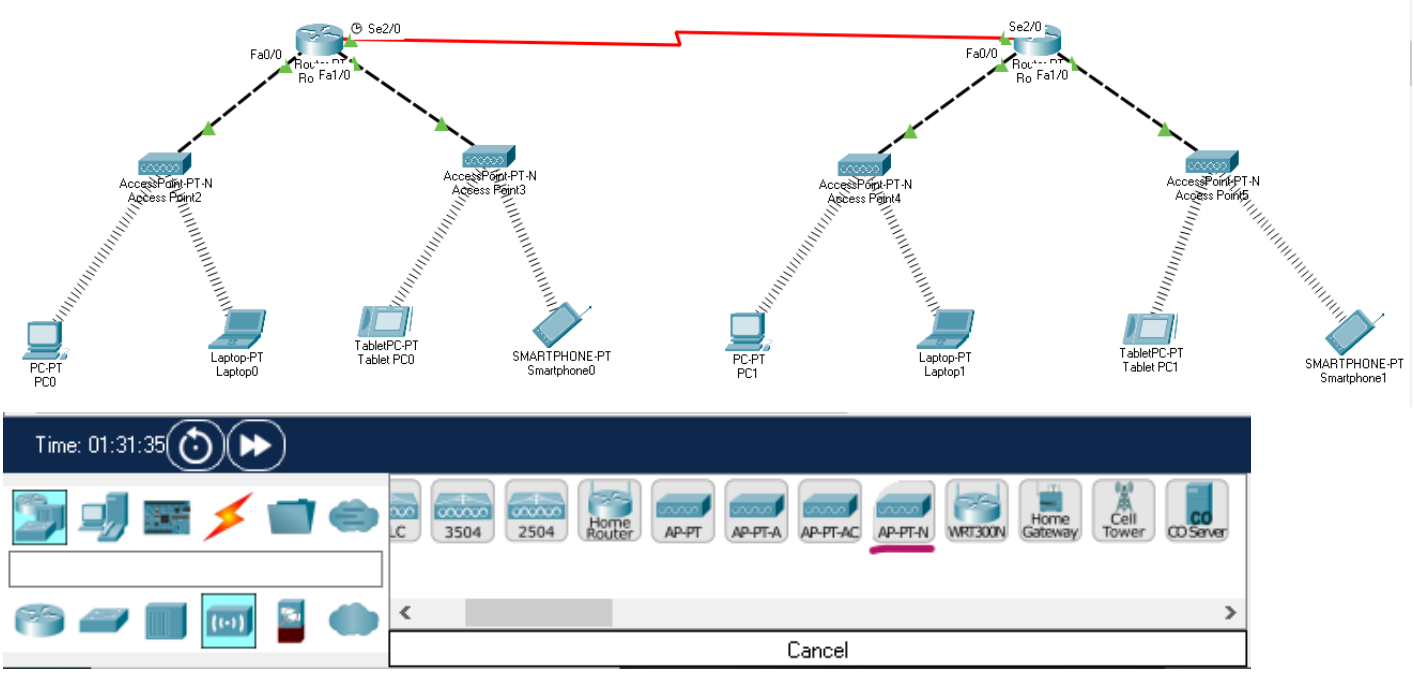
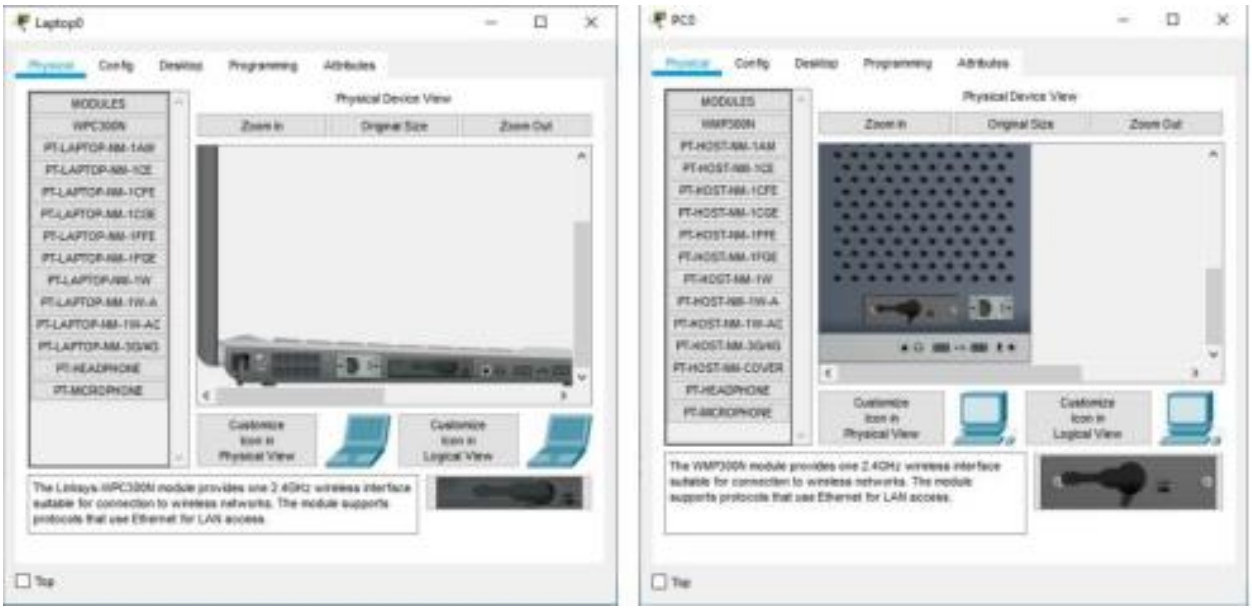
PRACTICAL NO: 06

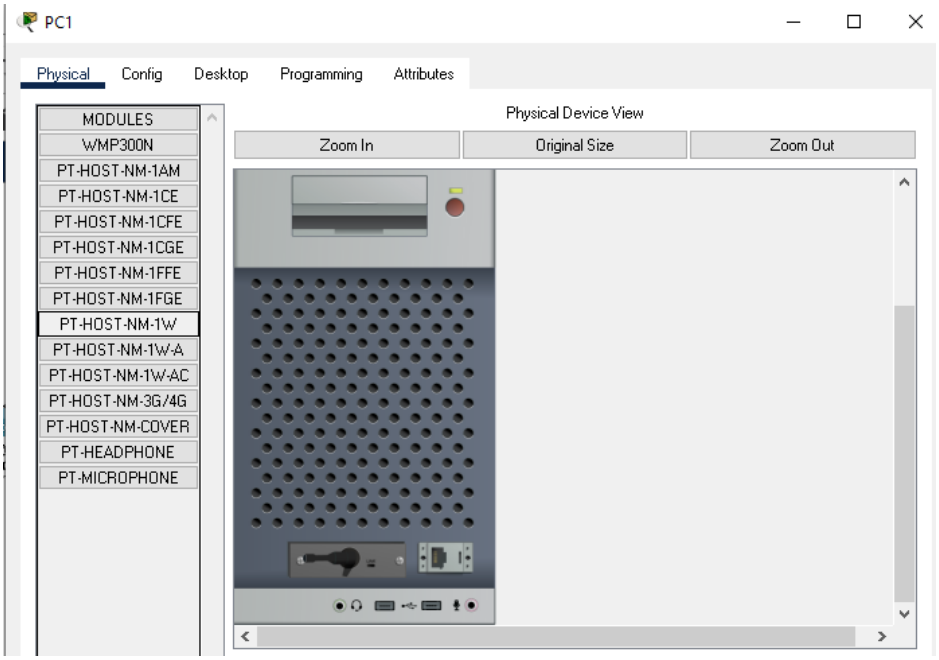
Aim: Implement a Wireless sensor network simulation.

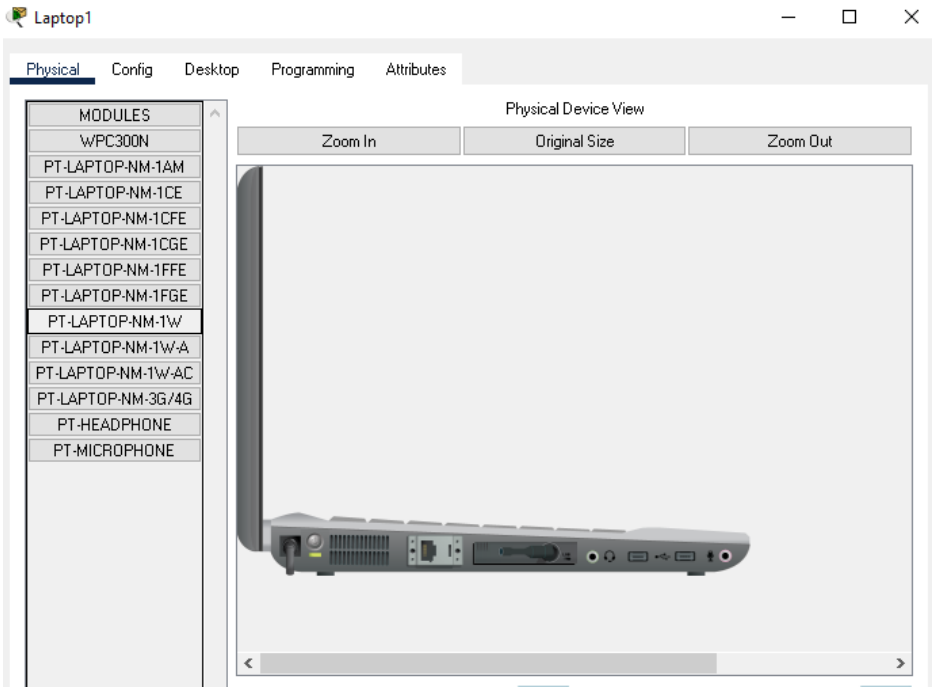
Step 1: Putting together all the end devices, Router and Access points.



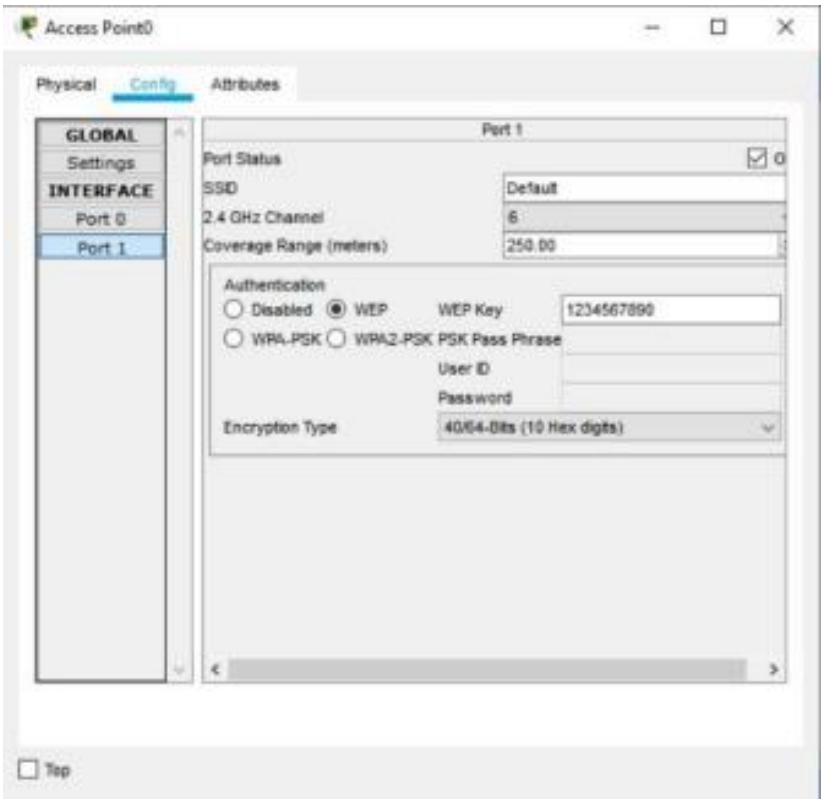
Step 2: Switching on the wireless interface on Laptop and PC.

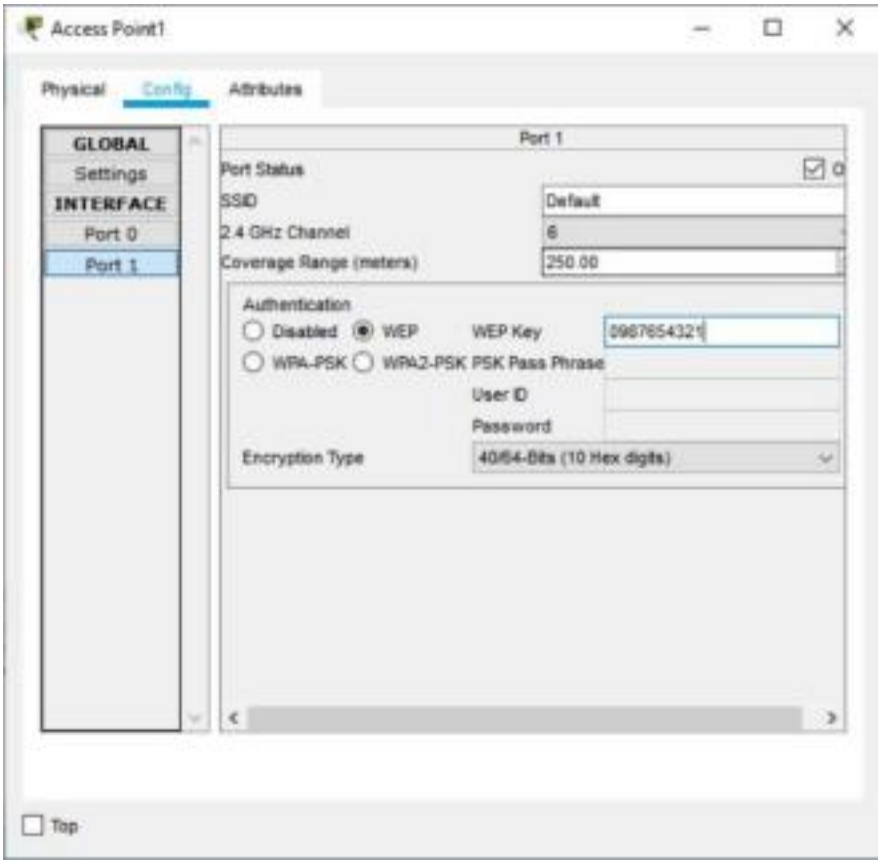


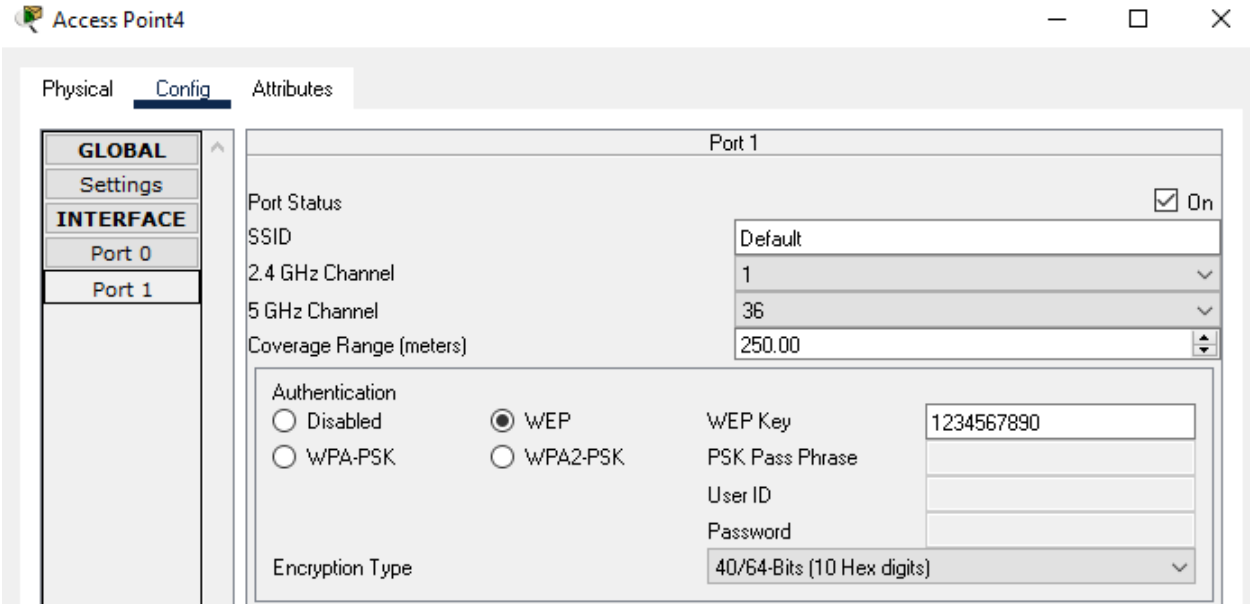

PC1
Physical
Config
Desktop
Programming
Attributes
MODULES
WMP300N
PT-HOST-NM-1AM
PT-HOST-NM-1CE
PT-HOST-NM-1CFE
PT-HOST-NM-1CGE
PT-HOST-NM-1FFE
PT-HOST-NM-1FGE
PT-HOST-NM-1W
PT-HOST-NM-1W-A
PT-HOST-NM-1W-AC
PT-HOST-NM-3G/4G
PT-HOST-NM-COVER
PT-HEADPHONE
PT-MICROPHONE
Physical Device View
Zoom In
Original Size
Zoom Out

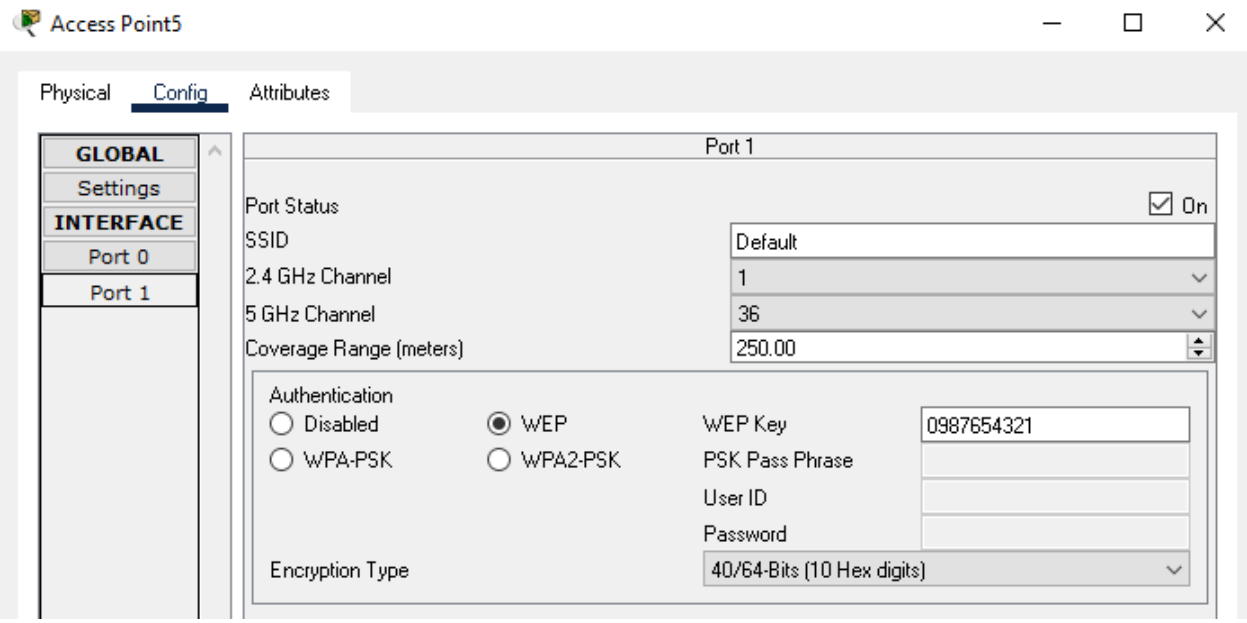

Laptop1
Physical
Config
Desktop
Programming
Attributes
MODULES
WPC300N
PT-LAPTOP-NM-1AM
PT-LAPTOP-NM-1CE
PT-LAPTOP-NM-1CFE
PT-LAPTOP-NM-1CGE
PT-LAPTOP-NM-1FFE
PT-LAPTOP-NM-1FGE
PT-LAPTOP-NM-1W
PT-LAPTOP-NM-1W-A
PT-LAPTOP-NM-1W-AC
PT-LAPTOP-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
Physical Device View
Zoom In
Original Size
Zoom Out

Step 3: Enabling WEP Authentication and securing the Access points.

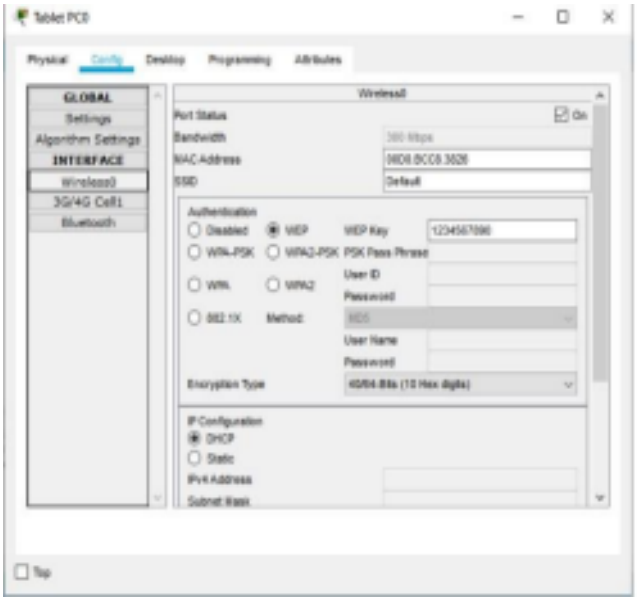


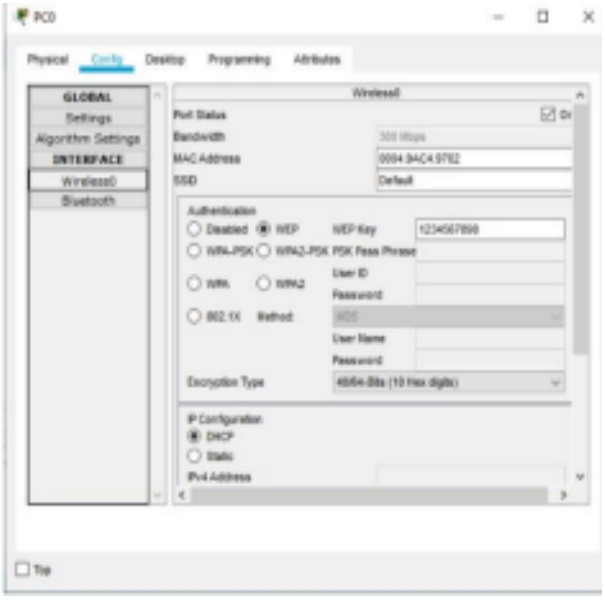

Access Point1
Physical
Config
Attributes
GLOBAL
Settings
INTERFACE
Port 0
Port 1
Port 1
Port Status
SSID
Default
2.4 GHz Channel
6
Coverage Range (meters)
250.00
Authentication
Disabled
WEP
WEP Key
0987654321
WPA-PSK
WPA2-PSK
PSK Pass Phrase
User ID
Password
Encryption Type
40/64-Bits (10 Hex digits)
Top

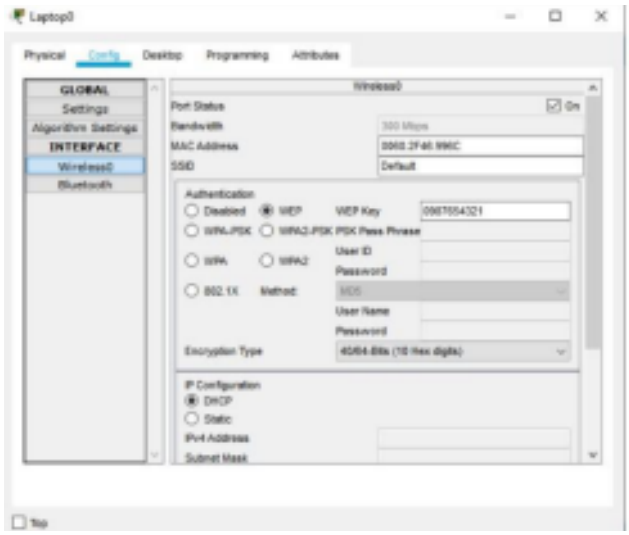

Access Point4
Physical
Config
Attributes
GLOBAL
Settings
INTERFACE
Port 0
Port 1
Port 1
Port Status
On
SSID
Default
2.4 GHz Channel
1
5 GHz Channel
36
Coverage Range (meters)
250.00
Authentication
Disabled
WEP
WEP Key
1234567890
WPA-PSK
WPA2-PSK
PSK Pass Phrase
User ID
Password
Encryption Type
40/64-Bits (10 Hex digits)

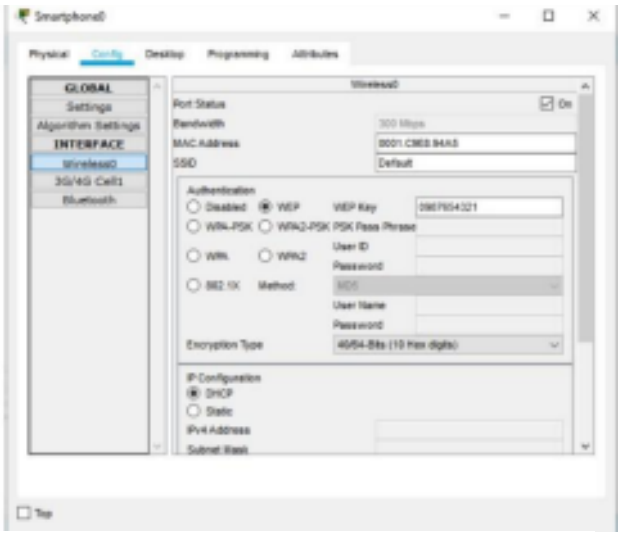


Step 4: Configuring End Devices to connect to the Secure Access points.









PC1

Physical | Config | Desktop | Programming | Attributes

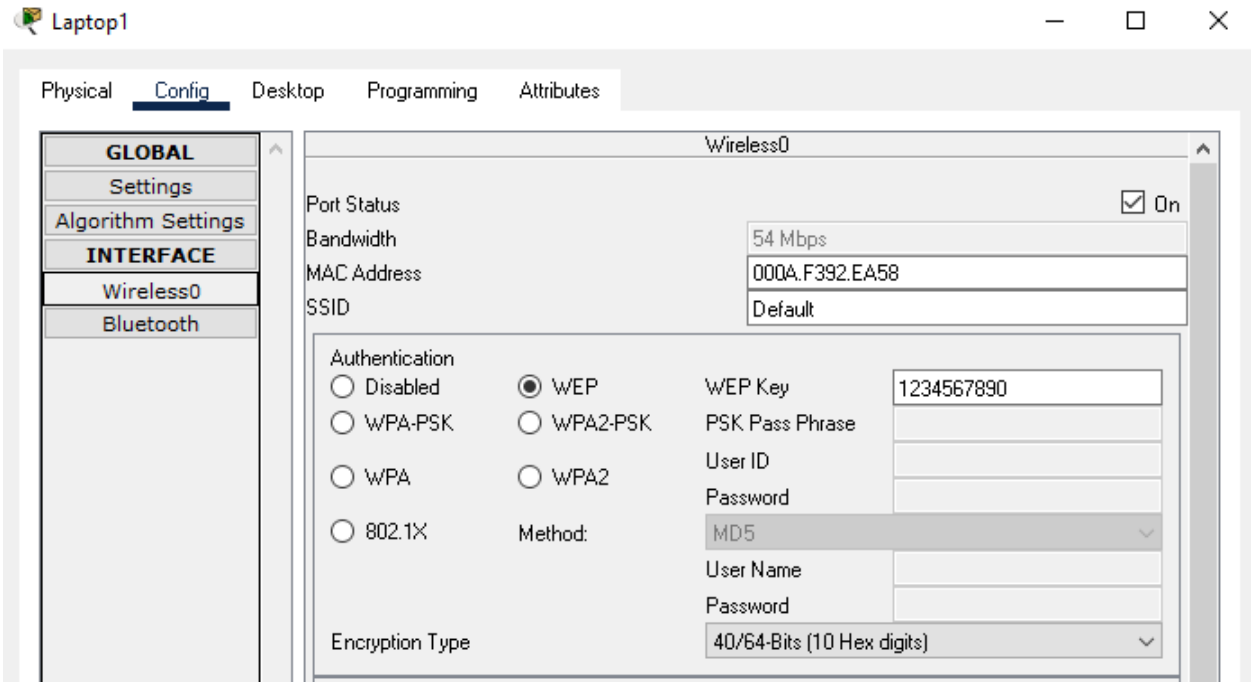
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
Bluetooth

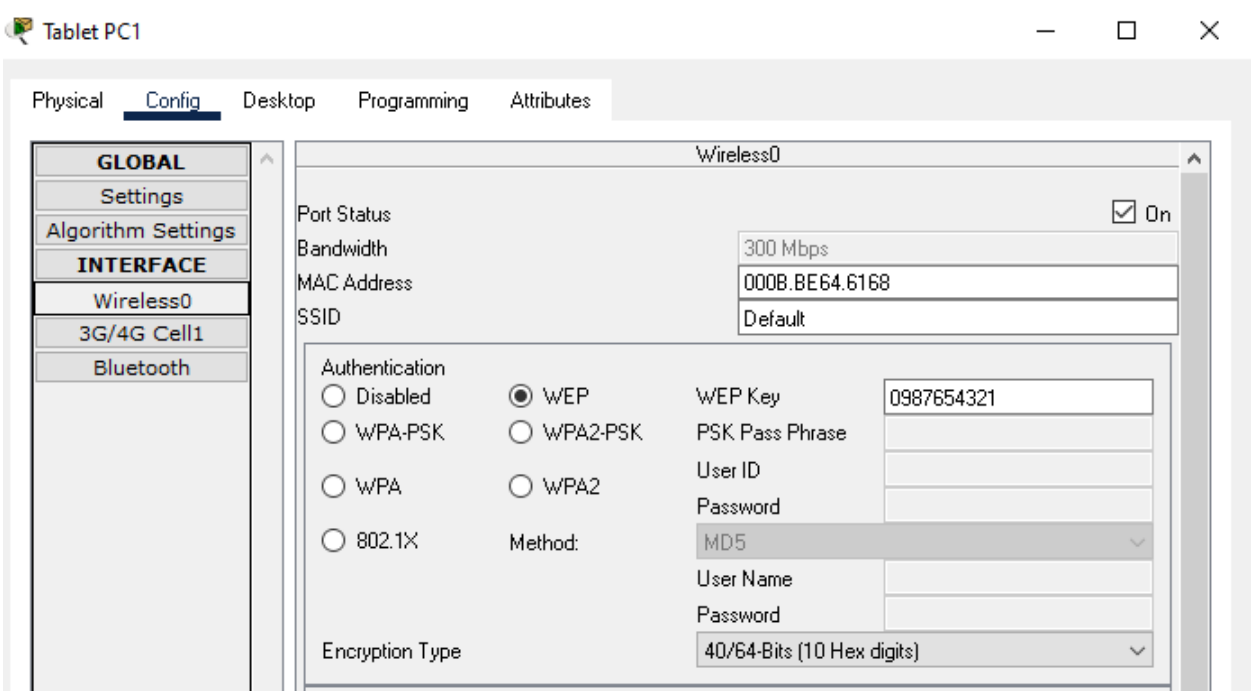
Wireless0

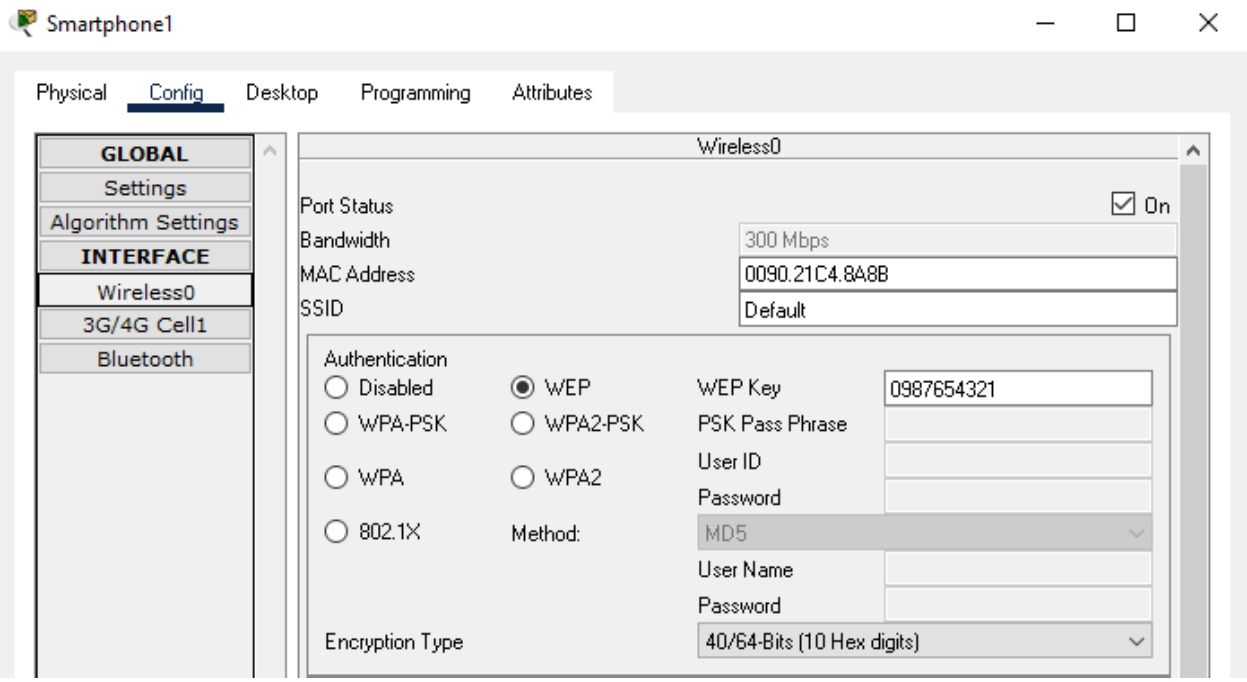
Port Status: On
Bandwidth: 36 Mbps
MAC Address: 0030.F276.5501
SSID: Default

Authentication
- Disabled
- WEP — WEP Key: 1234567890
- WPA-PSK
- WPA2-PSK — PSK Pass Phrase:
- WPA
- WPA2 — User ID:
- 802.1X — Method: MD5 — Password:
- User Name:
- Password:

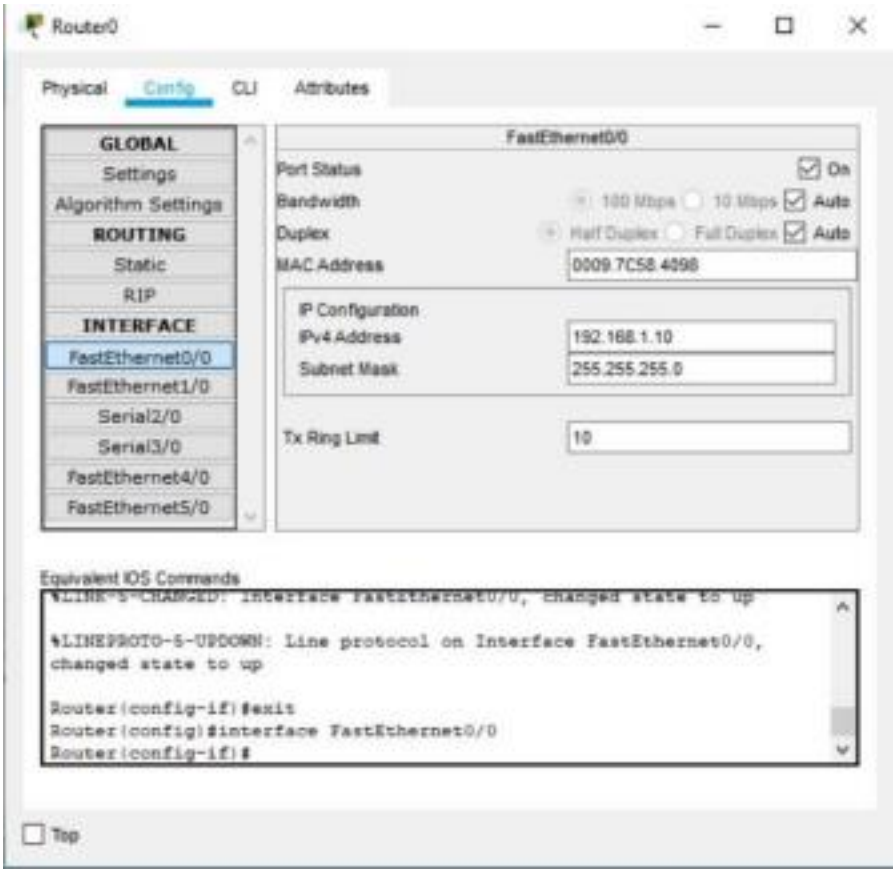
Encryption Type: 40/64-Bits (10 Hex digits)

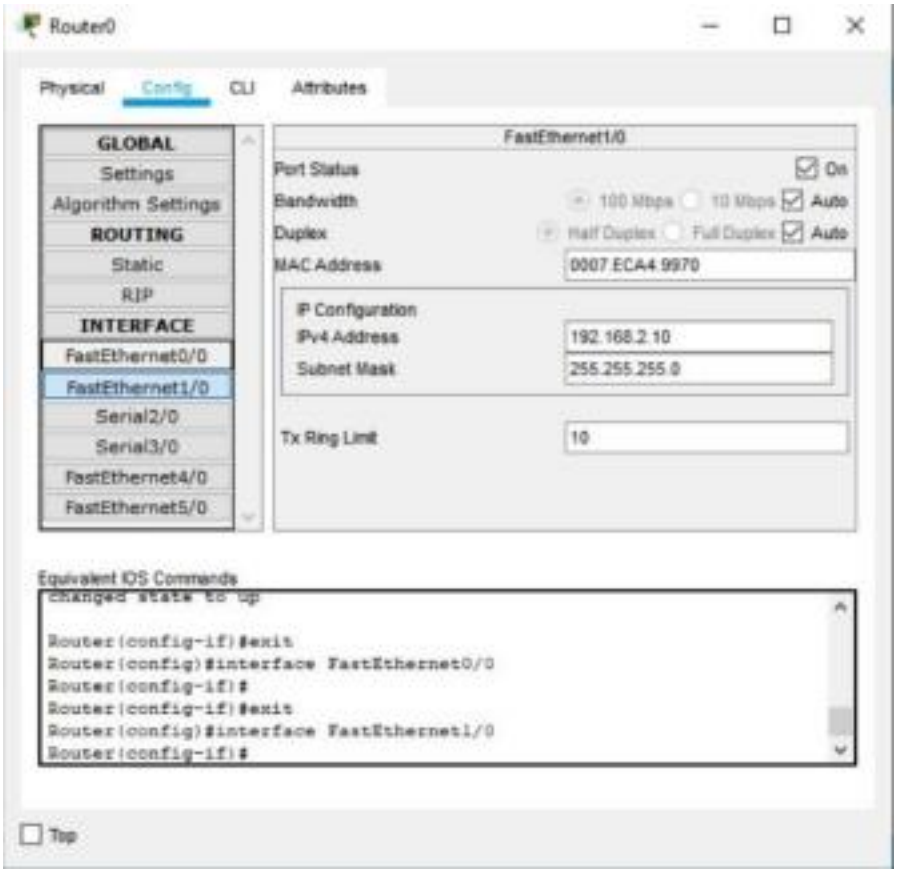

Laptop1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
On
Bandwidth
54 Mbps
MAC Address
000A.F392.EA58
SSID
Default
Authentication
Disabled
WEP
WEP Key
1234567890
WPA-PSK
WPA2-PSK
PSK Pass Phrase
User ID
WPA
WPA2
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
40/64-Bits (10 Hex digits)

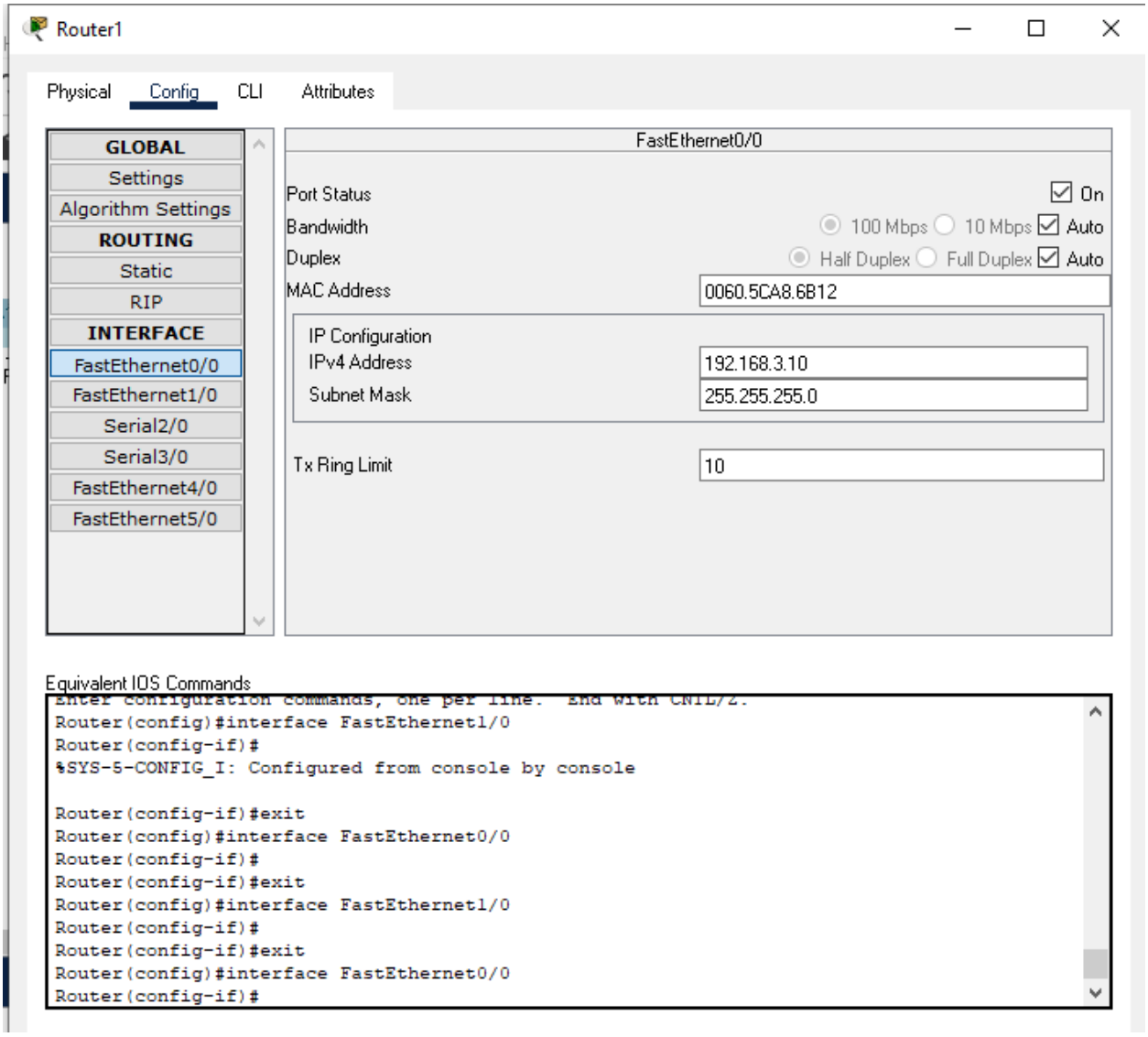

Tablet PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
3G/4G Cell1
Bluetooth
Wireless0
Port Status
On
Bandwidth
300 Mbps
MAC Address
000B.BE64.6168
SSID
Default
Authentication
Disabled
WEP
WEP Key
0987654321
WPA-PSK
WPA2-PSK
PSK Pass Phrase
User ID
WPA
WPA2
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
40/64-Bits (10 Hex digits)

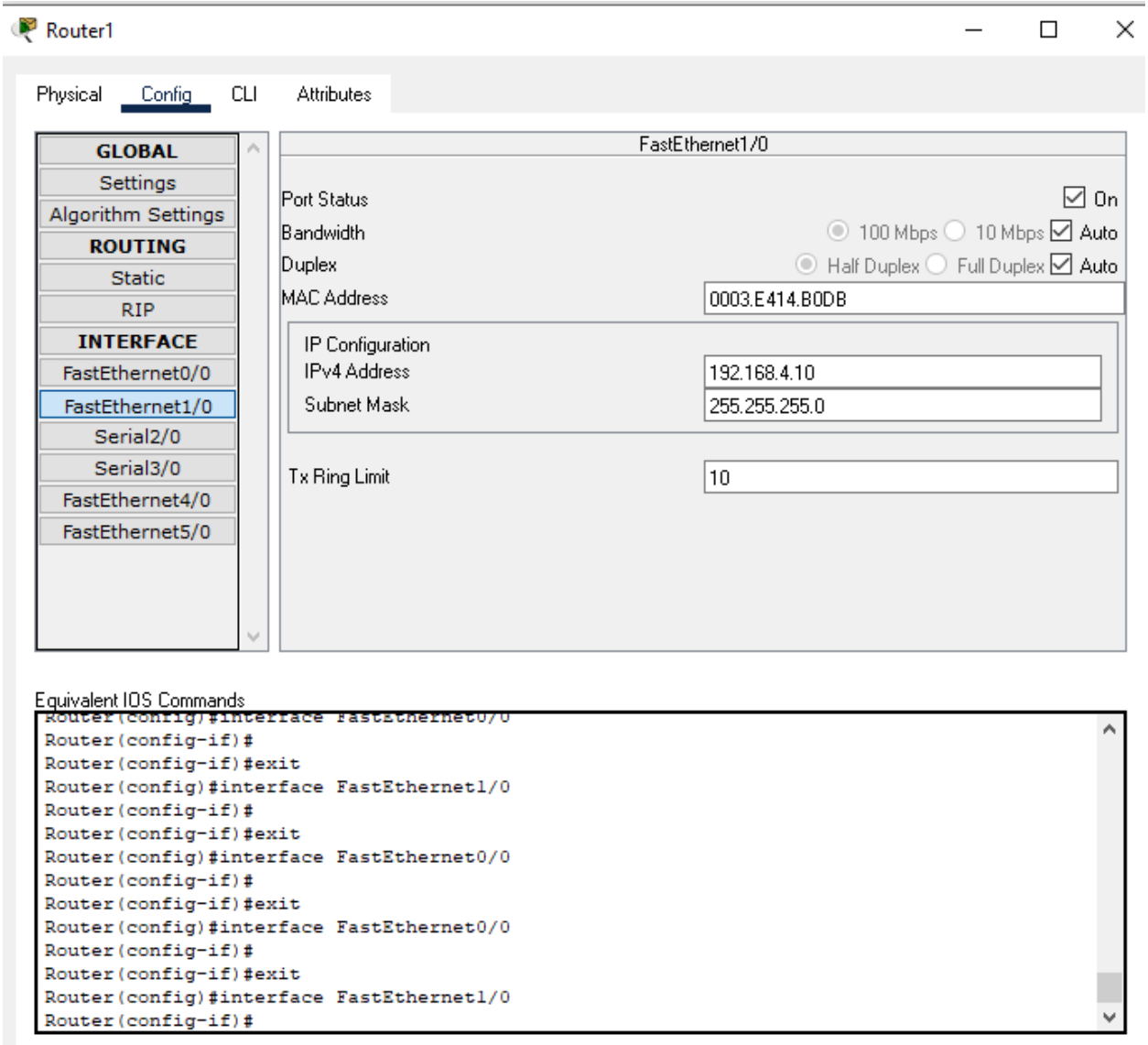


Step 5: Configuring IP addresses on Router and switching it on.

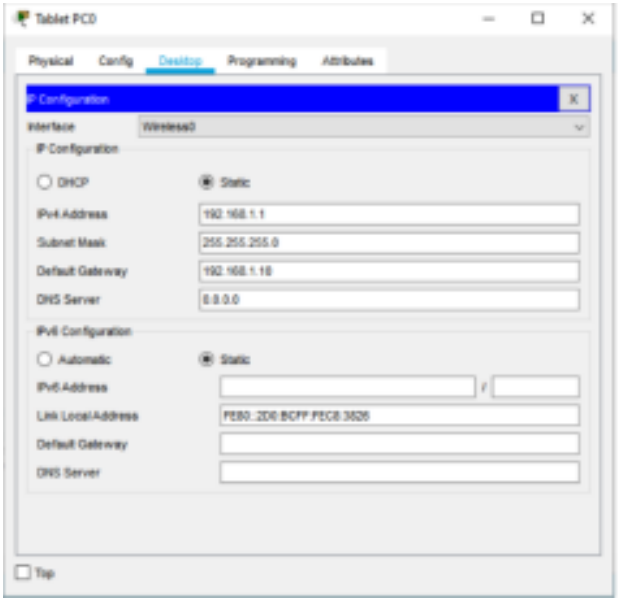


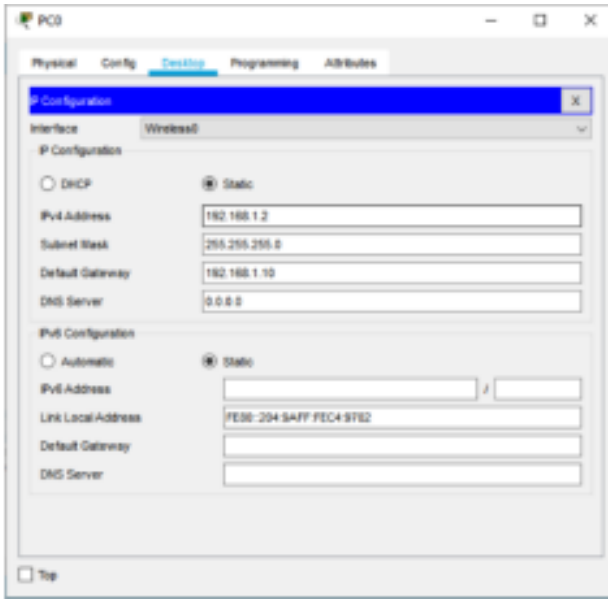

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
FastEthernet1/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0007.ECA4.9970
IP Configuration
IPv4 Address
192.168.2.10
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
changed state to up
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Top

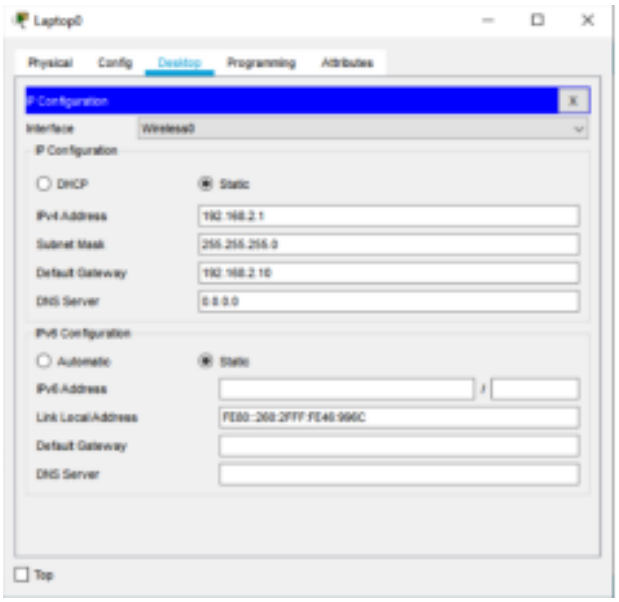

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0060.5CA8.6B12
IP Configuration
IPv4 Address
192.168.3.10
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface FastEthernet1/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#

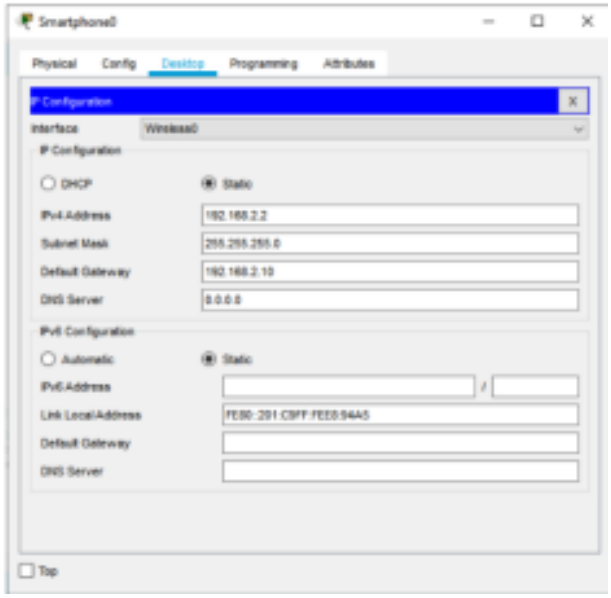

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
FastEthernet1/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0003.E414.B0DB
IP Configuration
IPv4 Address
192.168.4.10
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#

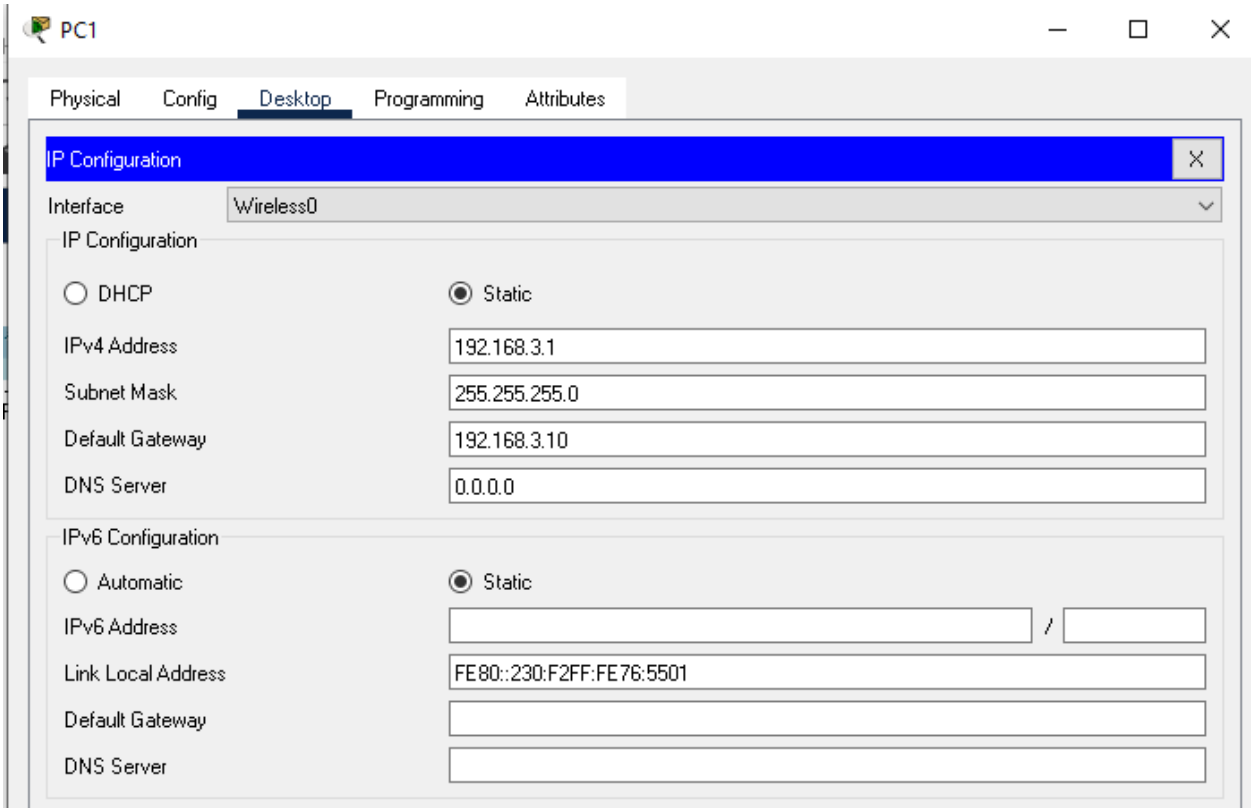
Step 6: Configuring IP addresses on End Devices connected to Access Points.

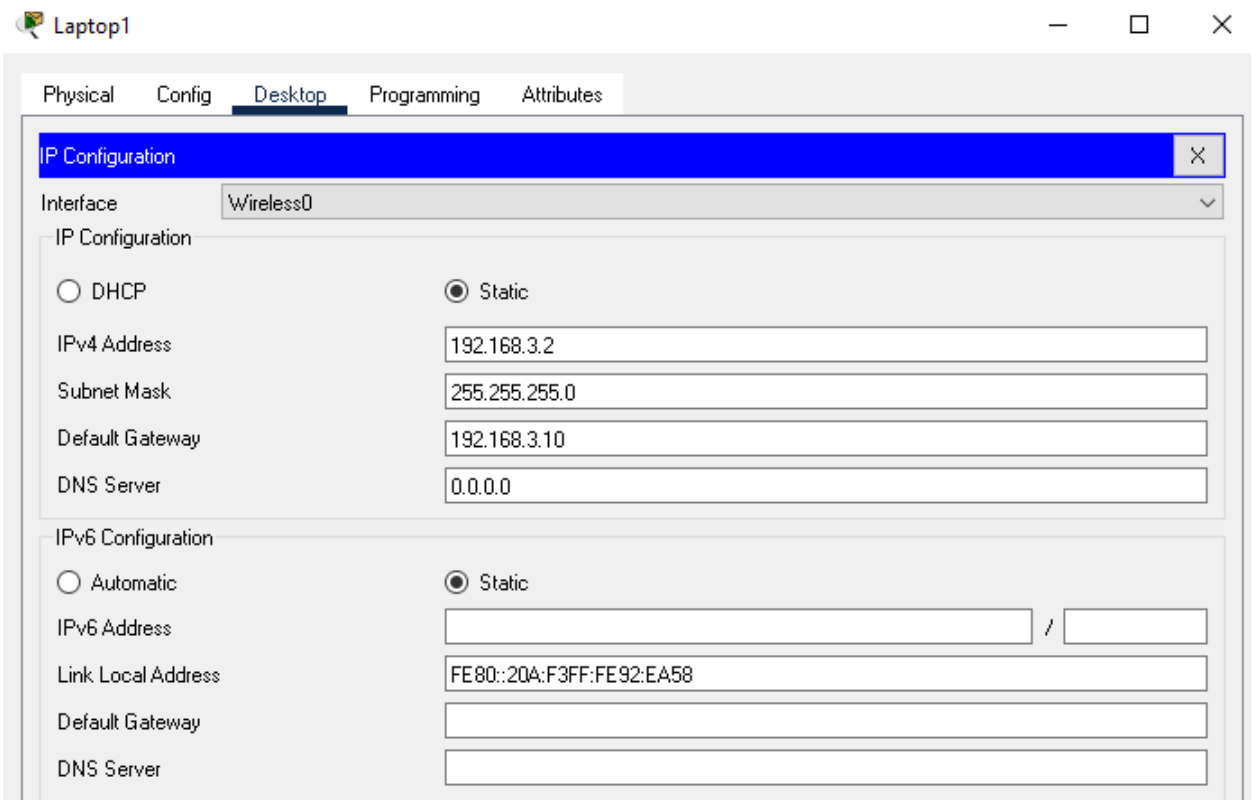


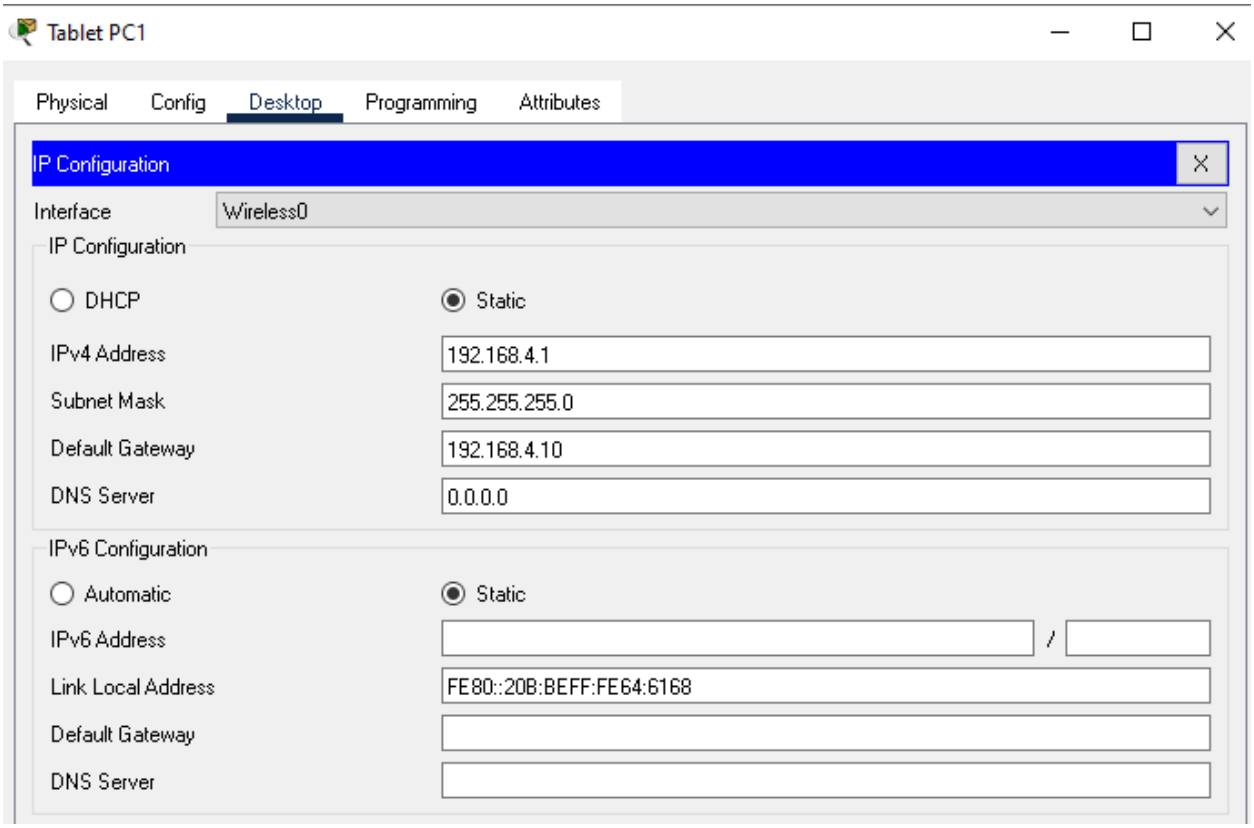


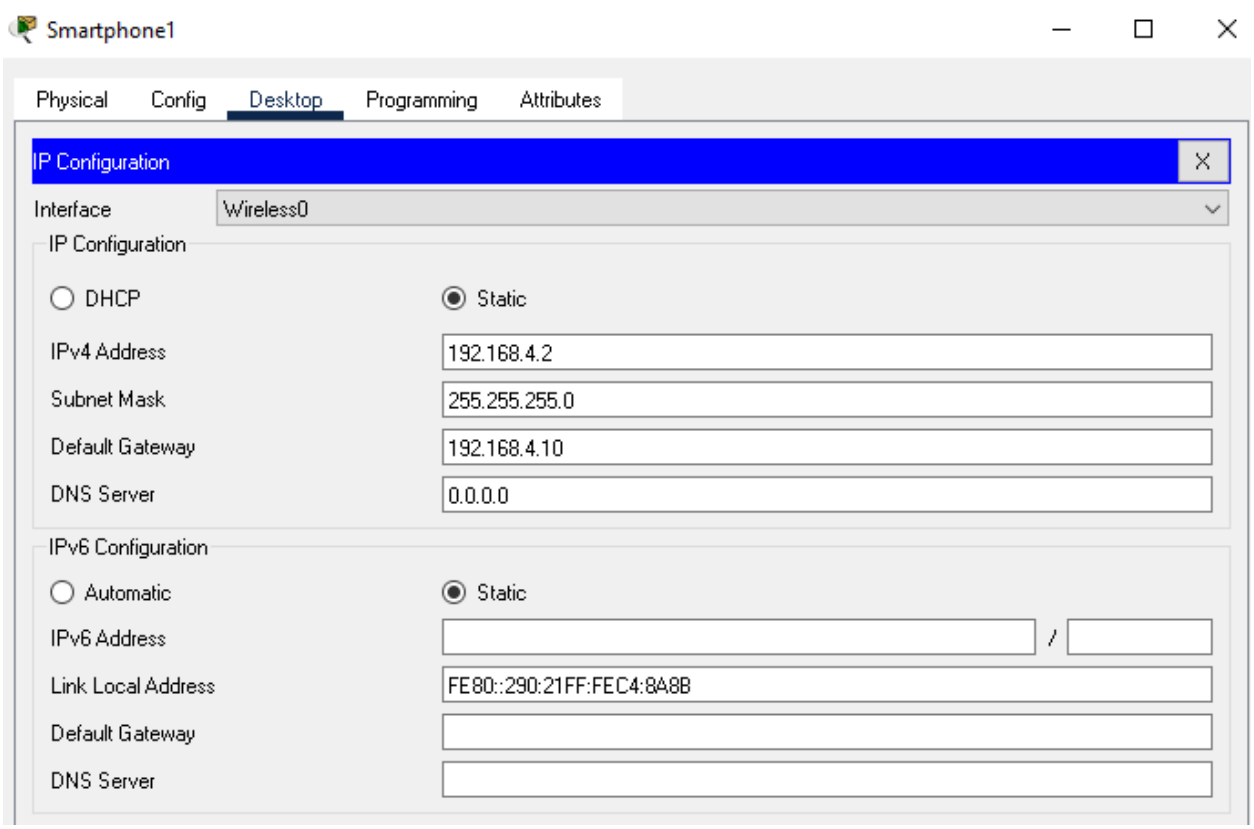




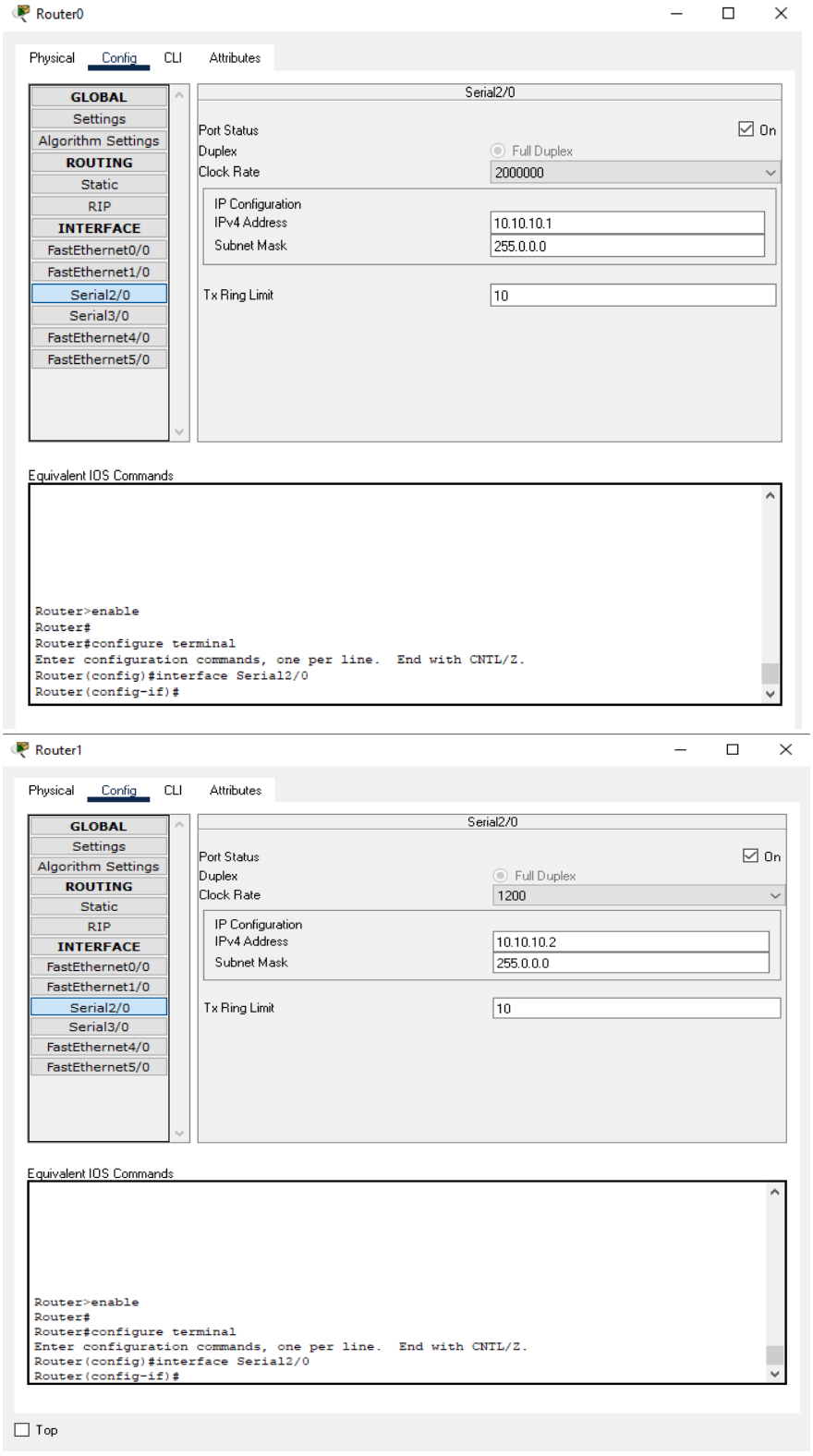

PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
Wireless0
IP Configuration
DHCP
Static
IPv4 Address
192.168.3.1
Subnet Mask
255.255.255.0
Default Gateway
192.168.3.10
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::230:F2FF:FE76:5501
Default Gateway
DNS Server


Laptop1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
Wireless0
IP Configuration
DHCP
Static
IPv4 Address
192.168.3.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.3.10
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20A:F3FF:FE92:EA58
Default Gateway
DNS Server

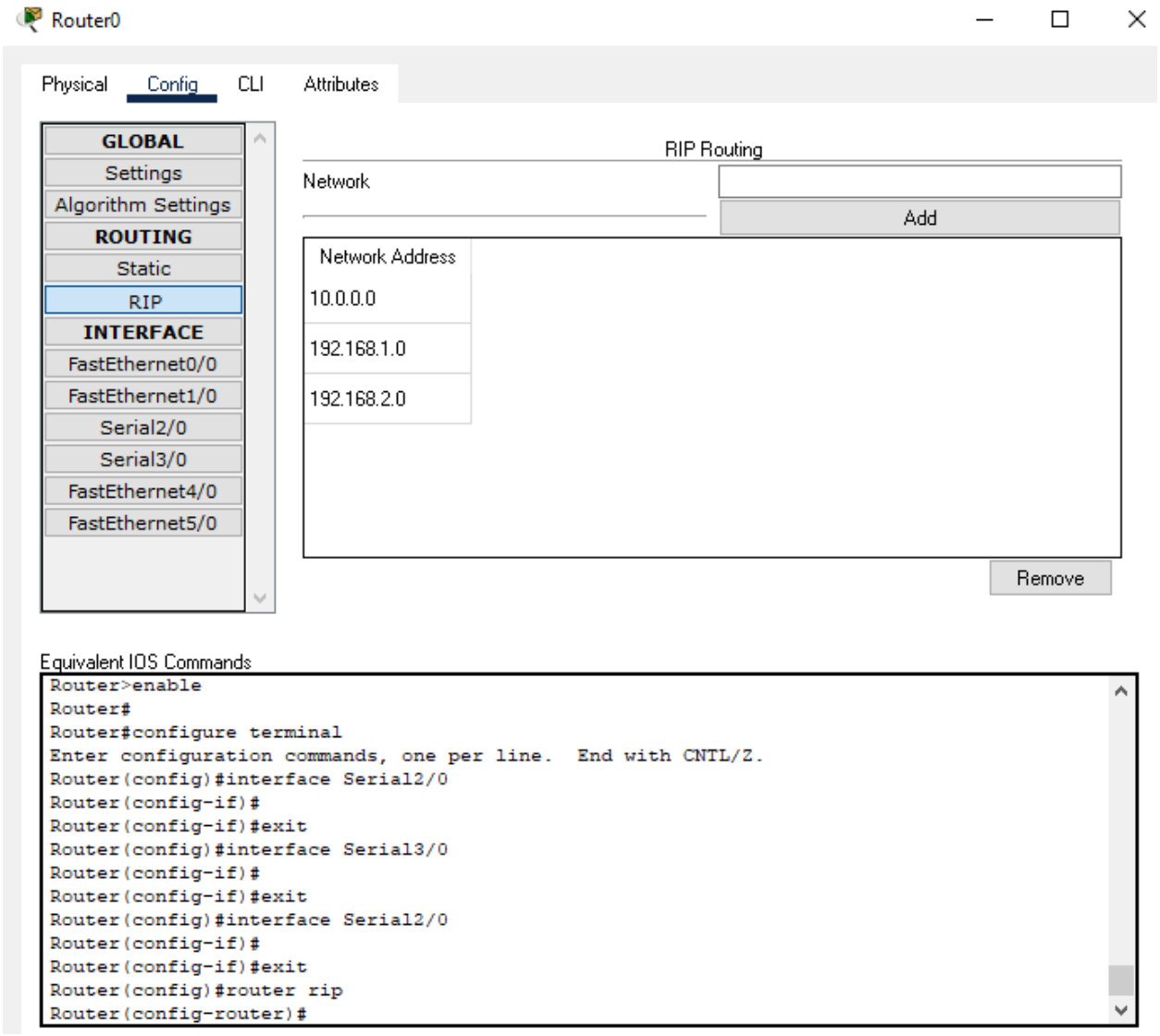

Tablet PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
Wireless0
IP Configuration
DHCP
Static
IPv4 Address
192.168.4.1
Subnet Mask
255.255.255.0
Default Gateway
192.168.4.10
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20B:BEFF:FE64:6168
Default Gateway
DNS Server

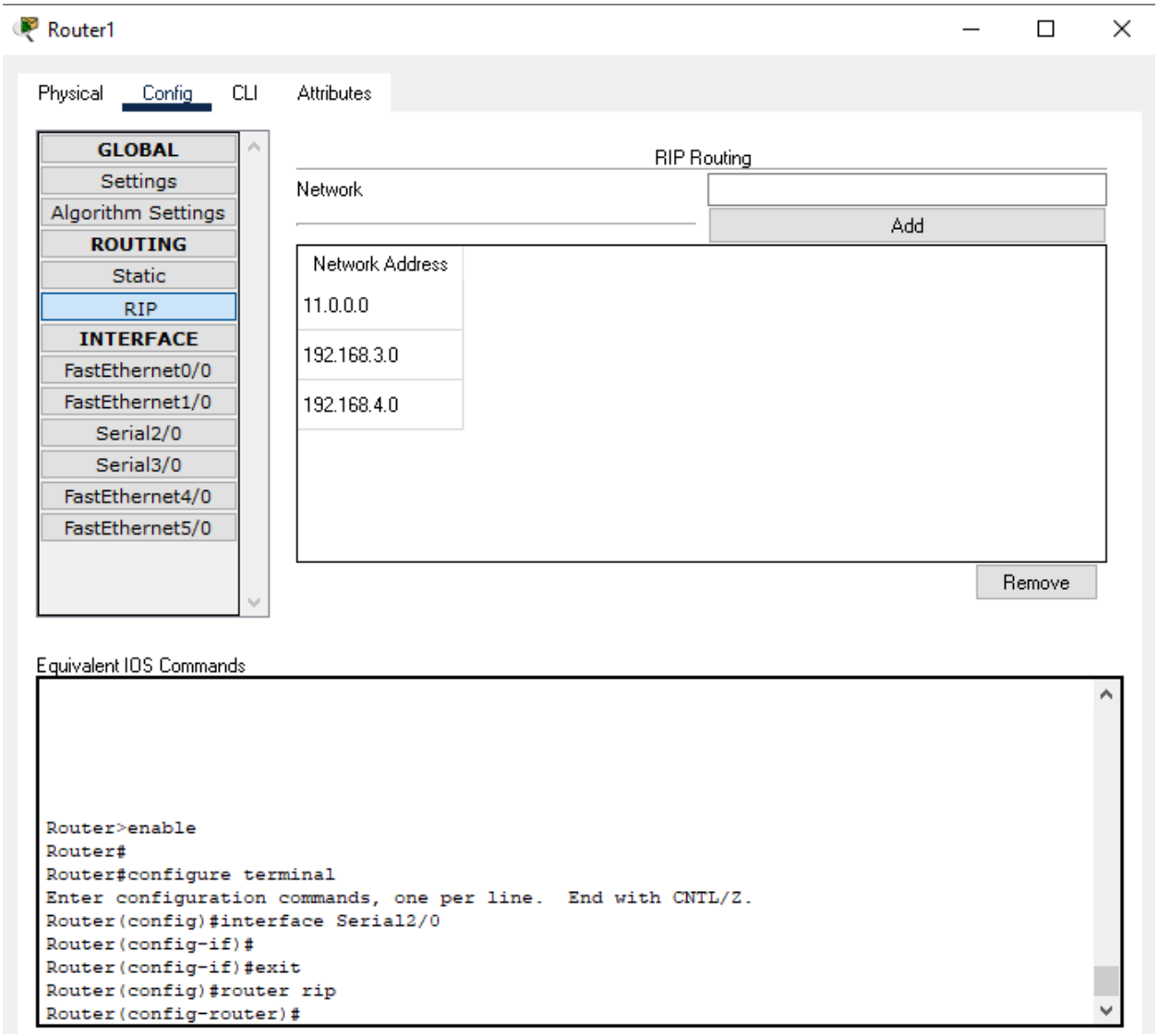
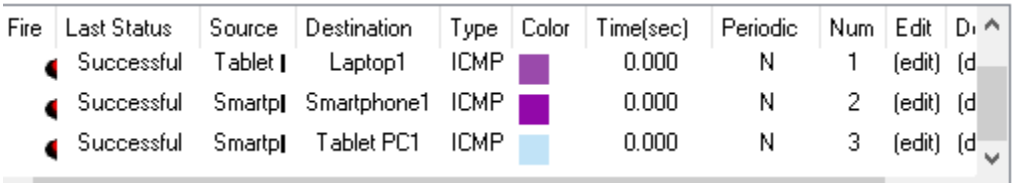

Smartphone1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
Wireless0
IP Configuration
DHCP
Static
IPv4 Address
192.168.4.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.4.10
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::290:21FF:FEC4:8A8B
Default Gateway
DNS Server

Step 7: Configuring IP addresses for Router-to-Router Serial Communication and switching it on.



Step 8: Configuring RIP Routing Protocol for Communication between all the devices across the Two Gateways.





Step 9: Checking if all the end devices across the wireless network can communicate with each other.