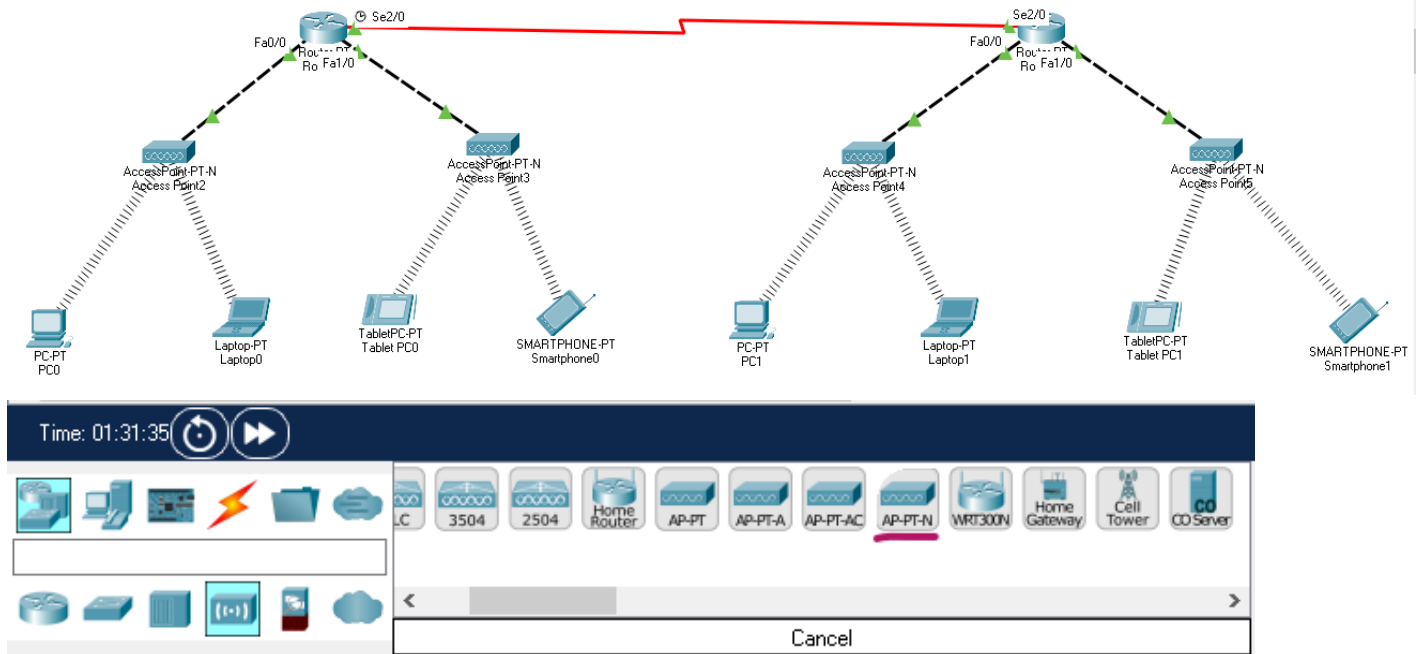


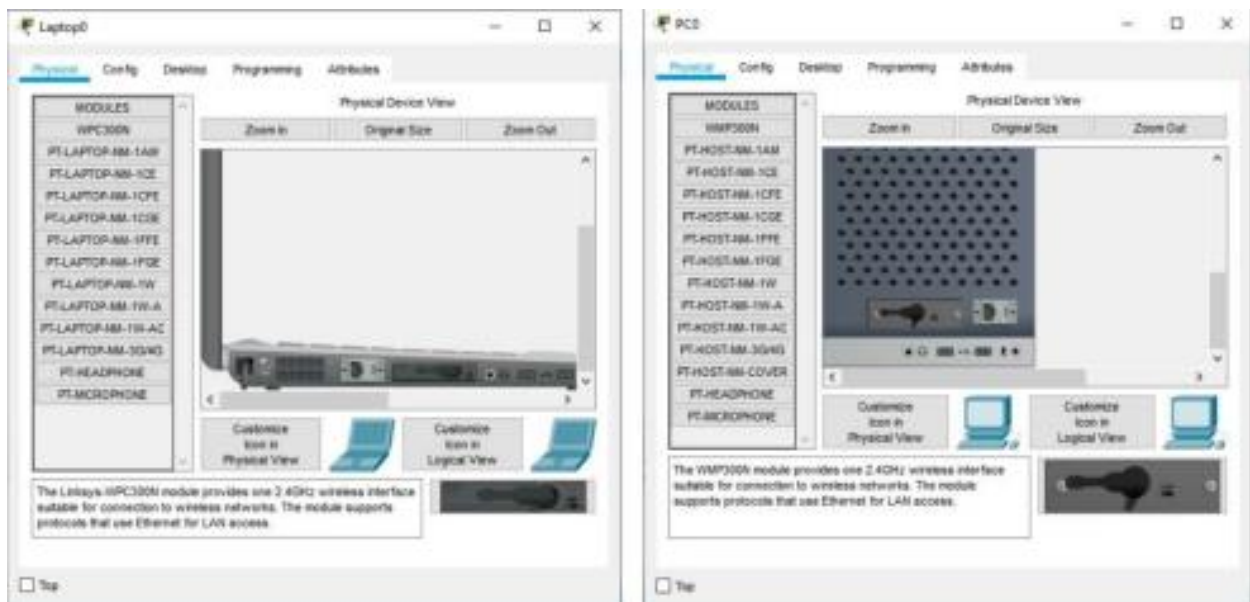
PRACTICAL NO: 06

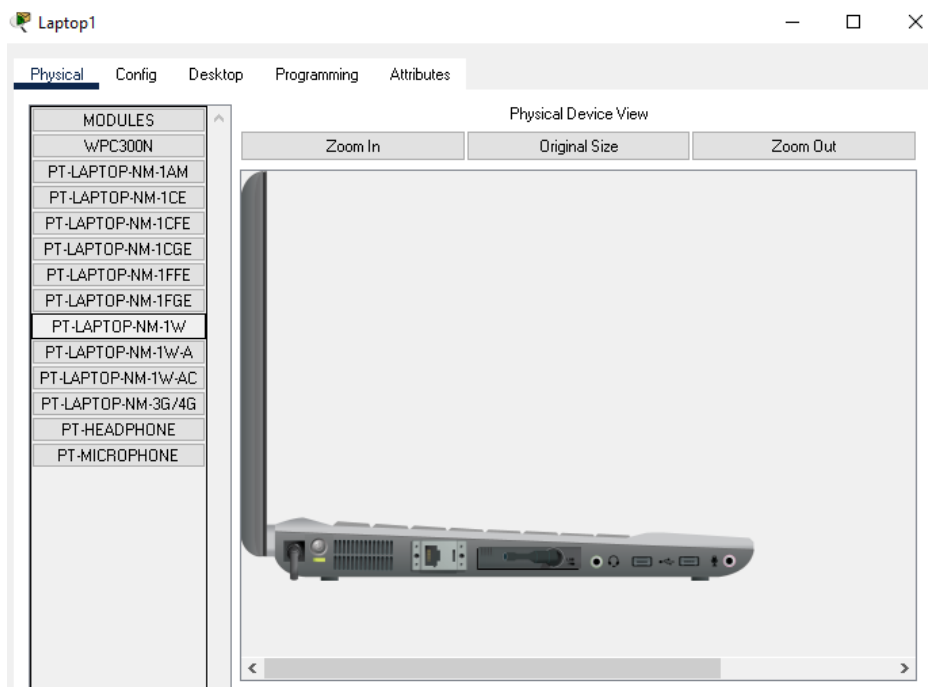
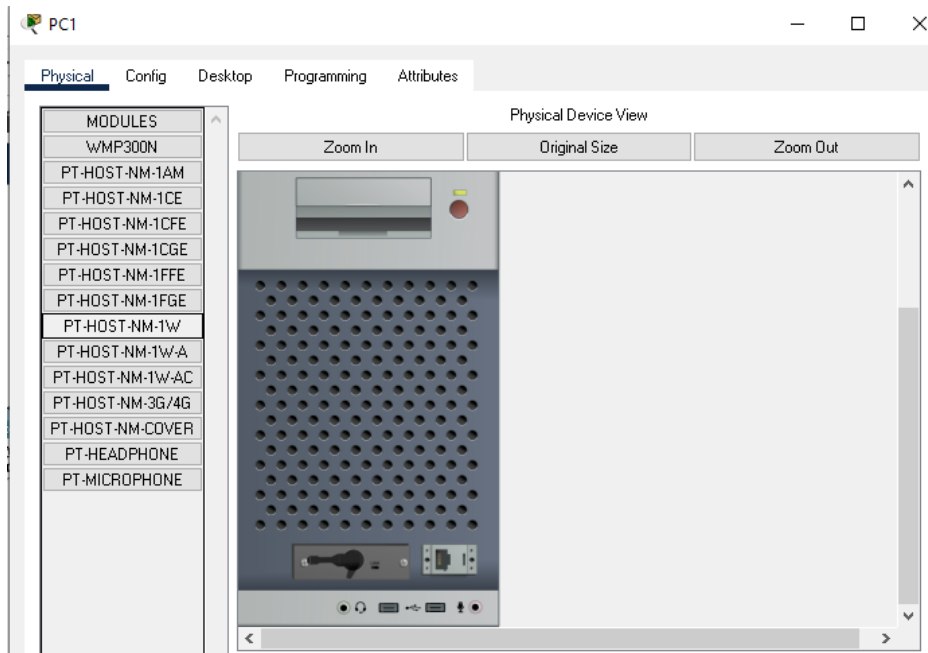
Aim: Implement a Wireless sensor network simulation.

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



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





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

The screenshot shows the 'Access Point0' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'GLOBAL' and 'INTERFACE' sections. Under 'INTERFACE', 'Port 0' and 'Port 1' are listed, with 'Port 1' selected. The main area displays the configuration for 'Port 1'. The 'Port Status' is checked. The 'SSID' is 'Default'. The '2.4 GHz Channel' is '6'. The 'Coverage Range (meters)' is '250.00'. The 'Authentication' section has three radio buttons: 'Disabled', 'WEP' (selected), and 'WPA2-PSK'. The 'WEP Key' is '1234567890'. The 'WPA2-PSK' section has fields for 'PSK Pass Phrase', 'User ID', and 'Password'. The 'Encryption Type' is '40/64-Bits (10 Hex digits)'. A 'Top' button is at the bottom left.

Port 1	
Port Status	<input checked="" type="checkbox"/>
SSID	Default
2.4 GHz Channel	6
Coverage Range (meters)	250.00
Authentication	
<input type="radio"/> Disabled	<input checked="" type="radio"/> WEP
<input type="radio"/> WPA2-PSK	<input type="radio"/> WPA2-PSK PSK Pass Phrase
WEP Key	1234567890
User ID	
Password	
Encryption Type	40/64-Bits (10 Hex digits)

Access Point1

Physical **Config** Attributes

GLOBAL

Settings

INTERFACE

Port 0

Port 1

Port 1

Port Status ☒ On

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

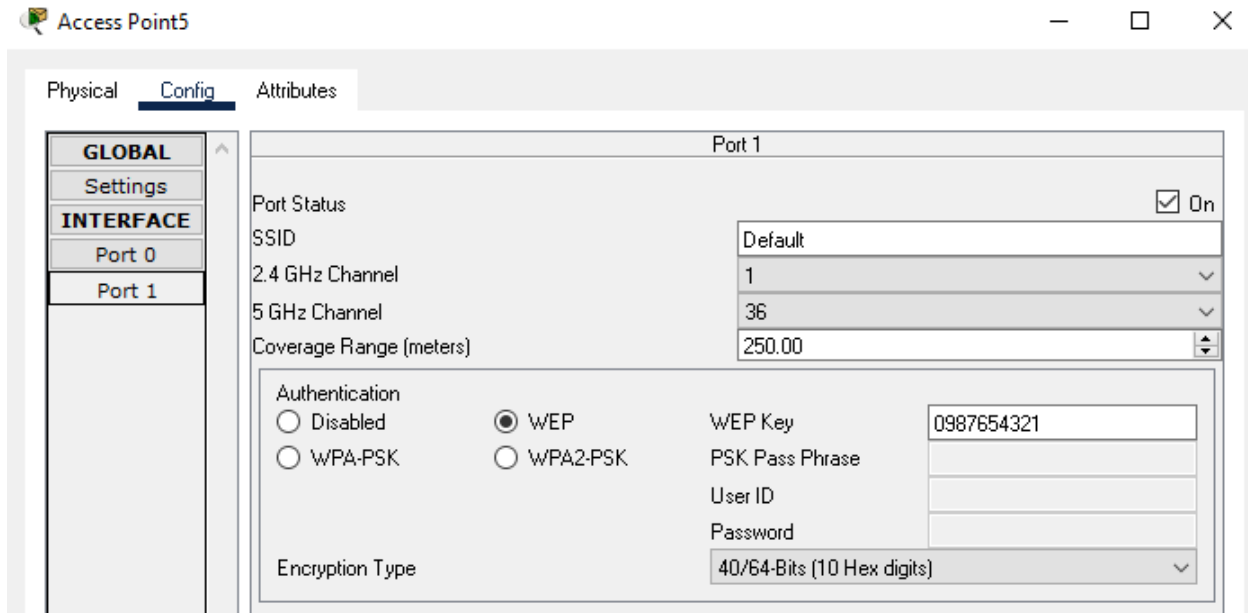
☐ Disabled ☒ WEP WEP Key 1234567890

☐ WPA-PSK ☐ WPA2-PSK PSK Pass Phrase

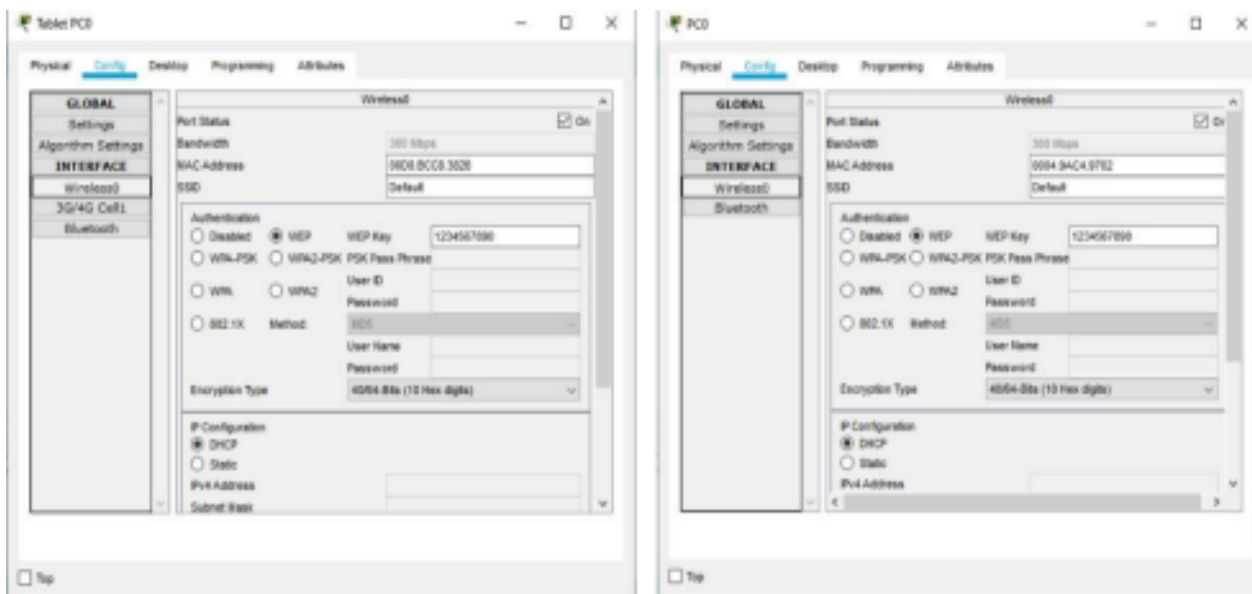
User ID

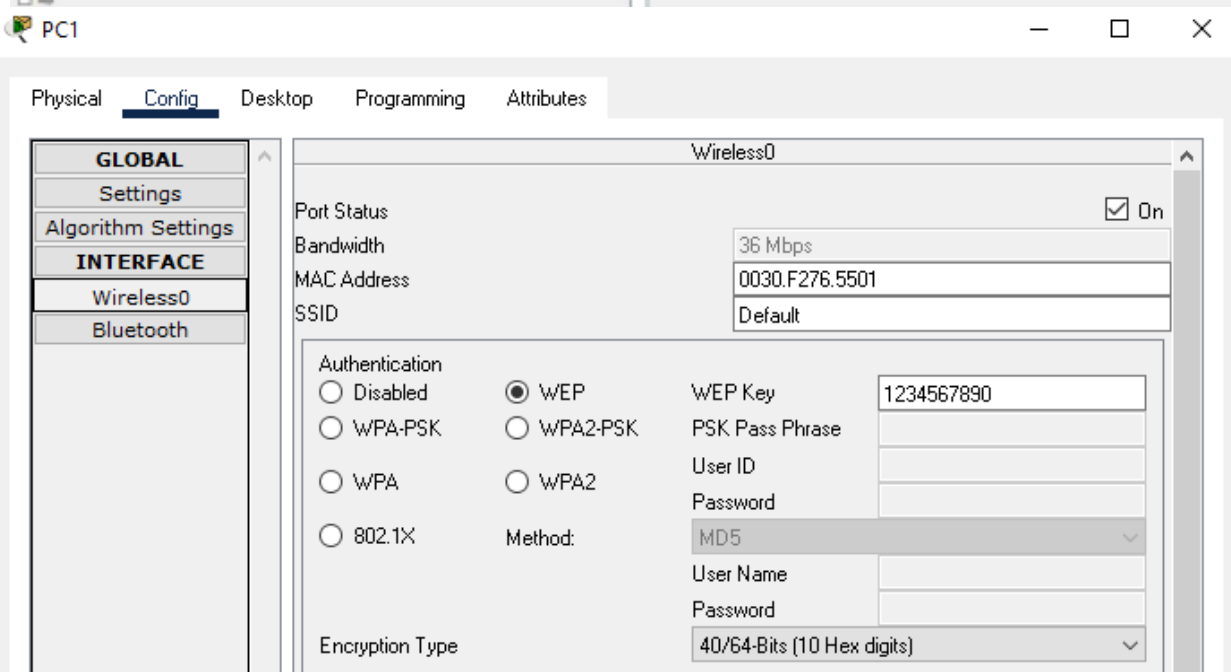
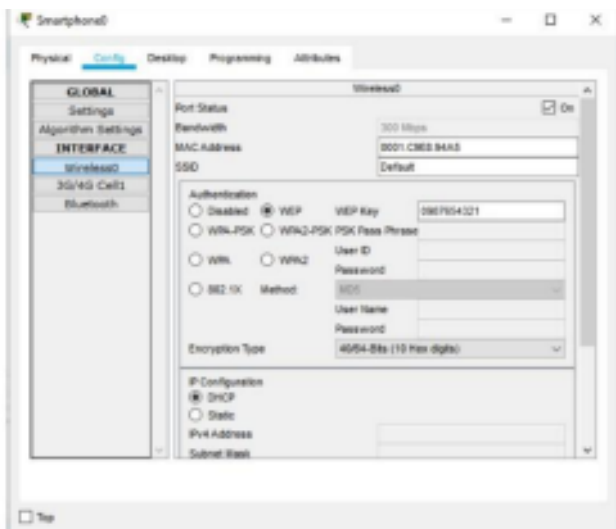
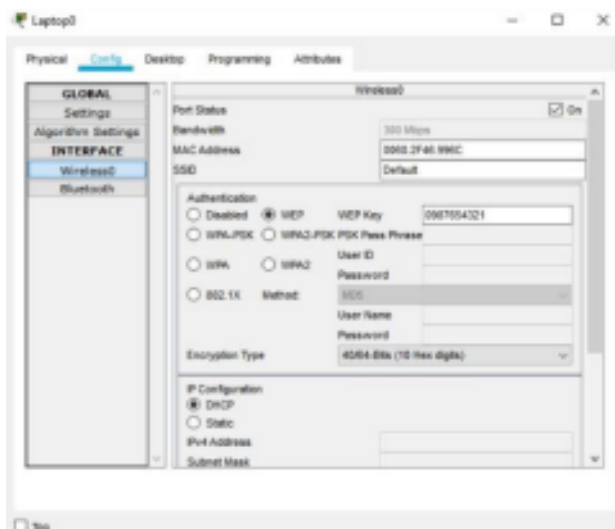
Password

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



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





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 ☐ WPA-PSK ☐ WPA2-PSK

☐ WPA ☐ WPA2

☐ 802.1X Method:

WEP Key 1234567890

PSK Pass Phrase

User ID

Password

MD5

User Name

Password

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

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 ☐ WPA-PSK ☐ WPA2-PSK

☐ WPA ☐ WPA2

☐ 802.1X Method:

WEP Key 0987654321

PSK Pass Phrase

User ID

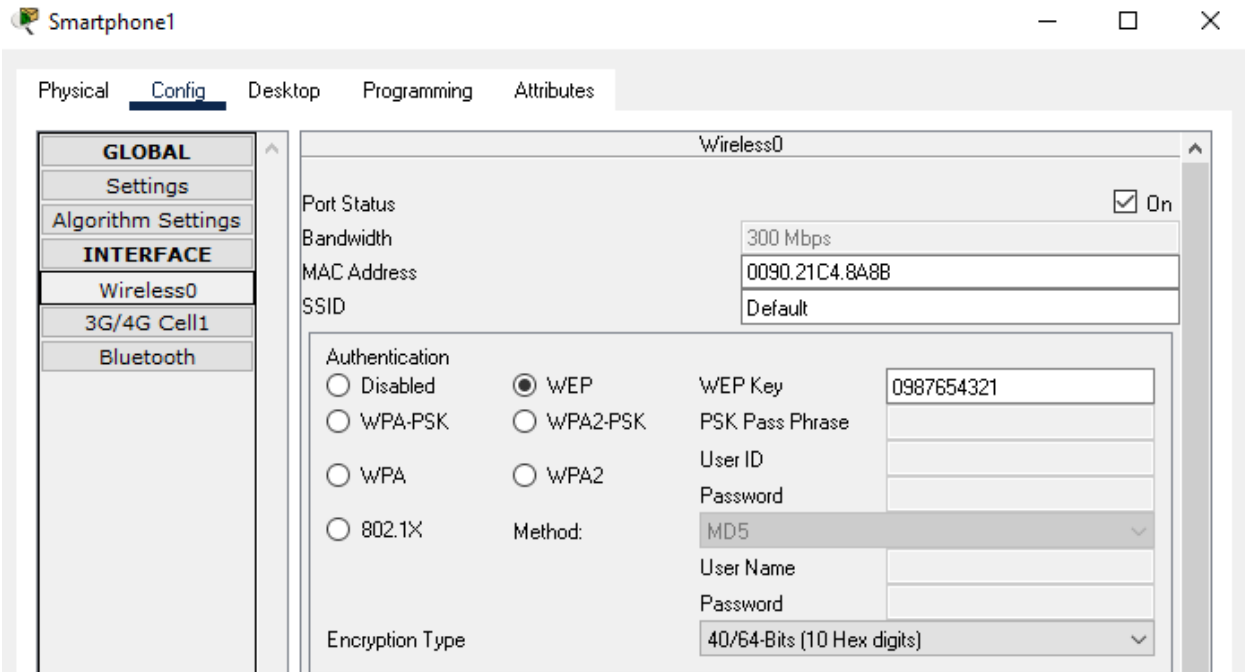
Password

MD5

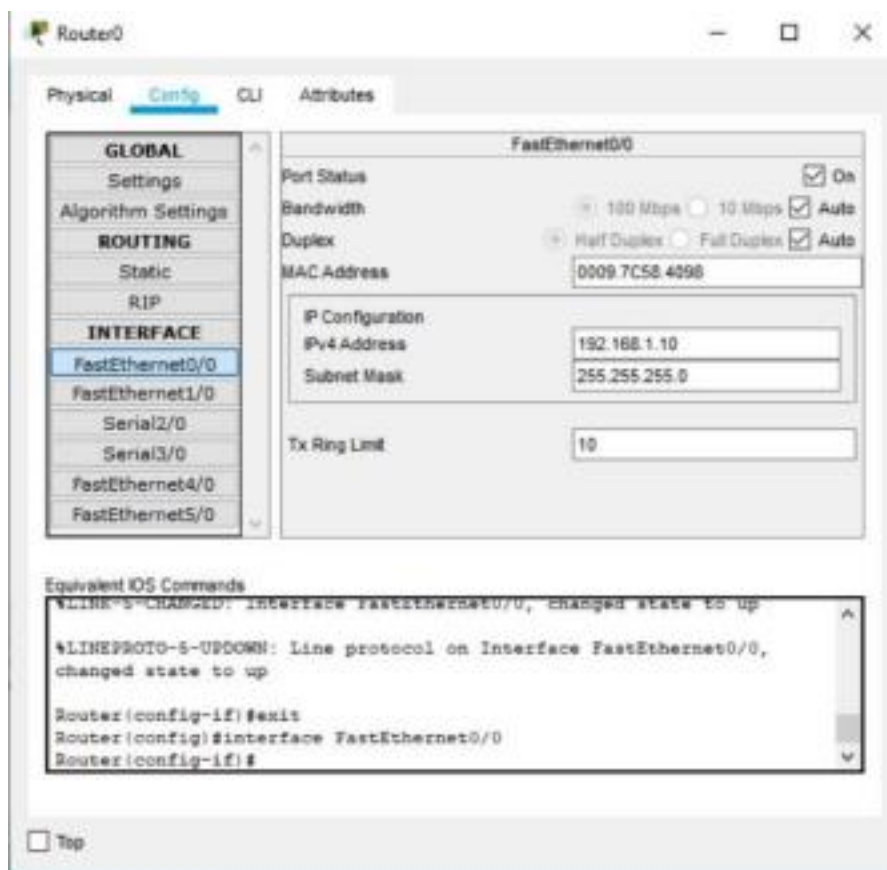
User Name

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

Pv4 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

0060.5CA8.6812

IP Configuration

IPv4 Address

192.168.3.10

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Enter configuration commands, one per line. End with CNTRL/Z.

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)#

Physical **Config** CLI Attributes

GLOBAL Settings Algorithm Settings ROUTING Static RIP INTERFACE FastEthernet0/0 FastEthernet1/0 Serial2/0 Serial3/0 FastEthernet4/0 FastEthernet5/0	<h3>FastEthernet1/0</h3> <p>Port Status <input checked="" type="checkbox"/> On</p> <p>Bandwidth <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto</p> <p>Duplex <input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto</p> <p>MAC Address <input type="text" value="0003.E414.B0DB"/></p> <div> <p>IP Configuration</p> <p>IPv4 Address <input type="text" value="192.168.4.10"/></p> <p>Subnet Mask <input type="text" value="255.255.255.0"/></p> </div> <p>Tx Ring Limit <input type="text" value="10"/></p>
---	---

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.

Tablet PC0

Physical Config Desktop Programming Attributes

IP Configuration

Interface: Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.18

DNS Server: 8.8.8.8

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80:2D0:BCFF:FE0B:3526

Default Gateway:

DNS Server:

☐ Top

PC0

Physical Config Desktop Programming Attributes

IP Configuration

Interface: Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.18

DNS Server: 8.8.8.8

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80:2D4:BAFF:FE04:97E2

Default Gateway:

DNS Server:

☐ Top

Laptop0

Physical Config Desktop Programming Attributes

IP Configuration

Interface: Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.2.1

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.2.10

DNS Server: 8.8.8.8

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80:260:2FFF:FE4B:996C

Default Gateway:

DNS Server:

☐ Top

Smartphone0

Physical Config Desktop Programming Attributes

IP Configuration

Interface: Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.2.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.2.10

DNS Server: 8.8.8.8

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80:291:C9FF:FE0B:94A5

Default Gateway:

DNS Server:

☐ Top

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::208: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.

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

Serial2/0

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 2000000

IP Configuration

IPv4 Address 10.10.10.1

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
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

Serial2/0

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 1200

IP Configuration

IPv4 Address 10.10.10.2

Subnet Mask 255.0.0.0

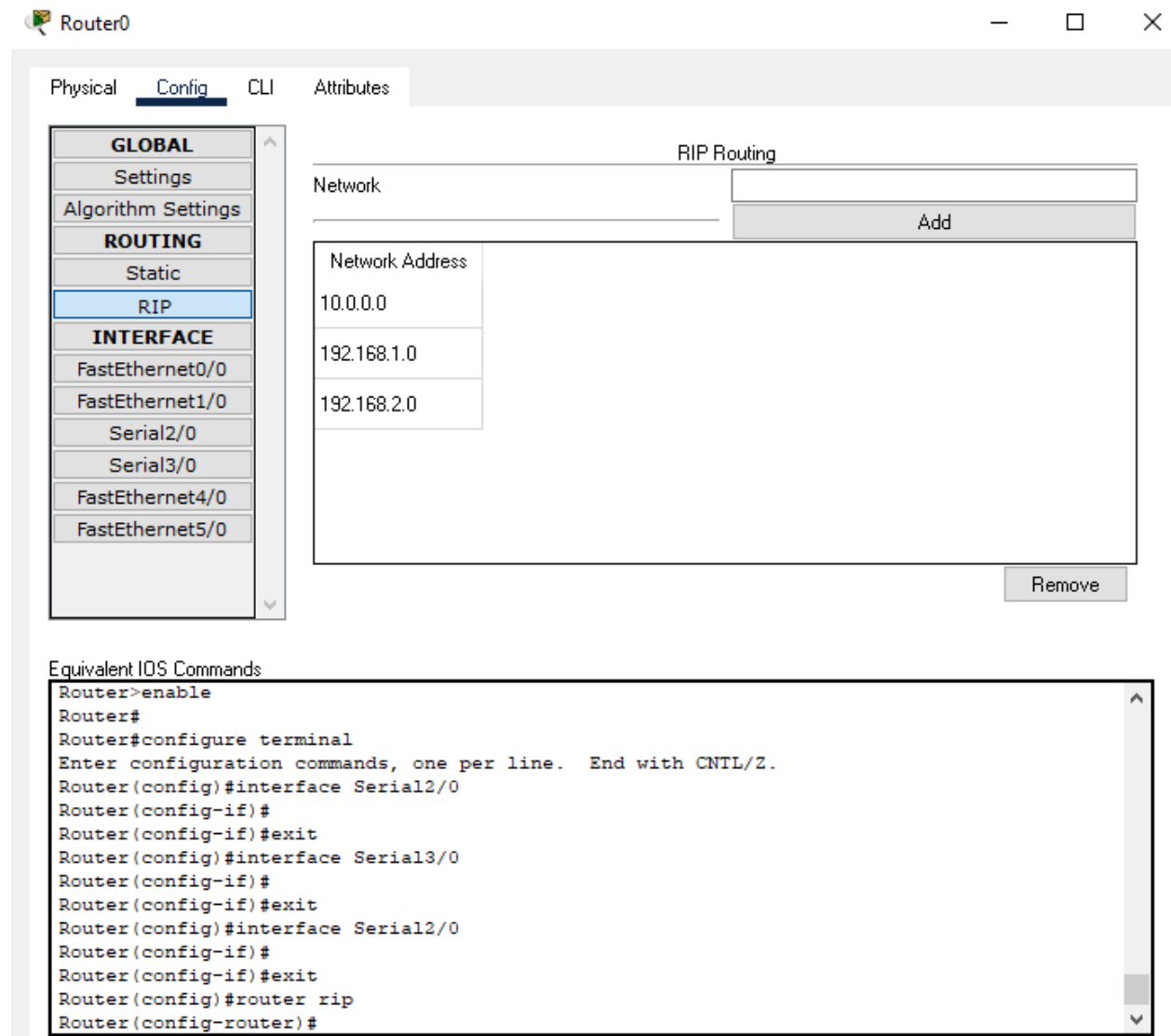
Tx Ring Limit 10

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
```

☐ Top

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



The screenshot shows the configuration window for Router0. The 'Config' tab is selected, and the 'RIP' option under the 'ROUTING' section is highlighted in the left sidebar. The main area is titled 'RIP Routing' and contains a table for configuring the protocol.

Network	
	<input type="text"/>
	<input type="button" value="Add"/>

Network Address
10.0.0.0
192.168.1.0
192.168.2.0

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
```


Router1

PhysicalConfigCLIAttributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

RIP Routing

Network

Add

Network Address

11.0.0.0

192.168.3.0

192.168.4.0

Remove

Equivalent IOS Commands

```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#

```

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

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	D
	Successful	Tablet I	Laptop1	ICMP		0.000	N	1	(edit)	(d
	Successful	SmartpI	Smartphone1	ICMP		0.000	N	2	(edit)	(d
	Successful	SmartpI	Tablet PC1	ICMP		0.000	N	3	(edit)	(d