Practical: 1

Aim: Observing different cables and connectors, configuring Wifi Access Point.

- **Types of Cables :**
  1. Ethernet cables
  2. Twisted-pair cables
  3. Coaxial cables
  4. Optical audio cables
  5. Fiber Optic cables

1. Ethernet Cables:

- Ethernet Cables connect computers in a Local Area Network, or LAN, within a small area such as a business, college campus or even your home. The wireless router common in many homes is connected to an Ethernet cable from the internet provider.

2. Twisted-pair cables:

- Twisted-pair Category 5e cables, also called CAT5e, are the industry standard for unshielded twisted-pair cables (UTP) for in-home and small business networking. Cables that are manufactured to prevent electromagnetic interference are shielded twisted-pair, or STP cables. CAT5e cables have an Ethernet capability of up to 1,000 megabits per second (Mbps) and can often carry infrared (IR or remote) control signals, eliminating the need for a separate IR network. They connect phones, computer networks, home automation networks and audio/video distribution systems.
- CAT5e cables typically consist of four pairs of wire (eight total conductors) wrapped in a single jacket. In addition, Category 6, or CAT6 cable, is a standardized twisted pair network cable designed to meet more stringent standards for crosstalk and system noise than CAT5e. Older categories, such as CAT5, have reduced transmission rates.

3. Coaxial cables:

- Coaxial cables are metallic cables most often used to carry television signals and connect video equipment. They provide protection from electromagnetic interference, allowing signals with low power to be transmitted over longer distances. They feature a central bayonet wire conductor covered with a dielectric or non-conducting insulator surrounded by mesh or a metal sheath. These components are then covered by a thin plastic layer for protection.

4. Optical audio cables:

- Optical audio cables may be used for phones, computer networks and cable television. They have less signal loss than copper and deliver clearer phone conversations or television reception. Multi-mode fiber is designed to carry data over shorter distances by using several rays of light at the same time.

5. Fiber Optic cables:

- Fiber optic cables use glass or plastic threads to transmit data quickly and efficiently using pulses of light rather than electrical signals. Apart from connecting components in home theaters, they are not as readily available for residential use as are coax and CAT5e. They transmit data at higher rates than coaxial or twisted-pair cables.

➢ Types of Connectors:

1. **Ethernet Cable Connectors**
2. **Coaxial Cable Connectors**
3. **USB Connectors**
4. **Fiber Optic Cable Connectors**

1. Ethernet Cable Connectors:

- RJ45 connectors are used for CAT6 cables and CAT5e cables. These connectors for twisted-pair Ethernet cables are similar in appearance to a standard telephone cord connector. They are wider, however, because they have eight conductors compared to only four conductors on a telephone jack.
- To install these types of wiring connectors, a stripping tool is used to expose the twisted pairs of wires from the cable, which are then positioned into the appropriate slots on the terminal plug. The connector is then crimped to the cable using a crimping tool.

2. Coaxial Cable Connectors:

- BNC connectors are a type of F-series connectors commonly found in households. This type of connector for RG59 or RG6 coaxial cable is used for cable television equipment, broadcast TV antennas and CCTV security camera installations. They are easy to connect and disconnect from equipment and provide inexpensive, stable connections to these communications devices and other cables.
- To install a BNC connector, use a stripping tool to remove protective shields from the cable. The connector is pushed onto the end and then squeezed around the conductive material using a special compression crimper.

3. USB Connectors:

- USB connectors are the most familiar to the majority of people. USB (Universal Serial Bus) connectors typically join external devices to a personal computer or are used for mobile phone charging. There are adapters that will allow an Ethernet cable to connect directly to a USB port, though this type of setup would be a temporary solution for networking.

4. Fiber Optic Cable Connectors

- Fiber optic connectors require different types of connectors from those used with coax or twisted-pair cables, such as CAT5e. These types of connectors in networking must align glass fibers with precision to allow for communication. If you choose to use

optical cable over twisted pair Ethernet, you may need to install a special adapter in your computer to utilize various fiber optic cable connector types.

- SC connectors: A push-pull latching mechanism in SC connectors provides quick insertion and removal while also ensuring a positive connection.
- ST connectors: ST connectors were among the first connectors in networking fiber optic cable. These use a plug and socket, which is locked in place with a twist-style bayonet lock.
- LC connectors: LC-type connectors have a squarish duplex configuration. Installation of this small form factor (SFF) connector is quick for rapid repair of replacement needs.

❖ Configuring Wifi access point.

- We are try to understand whole configuration of wifi access point through below figure.

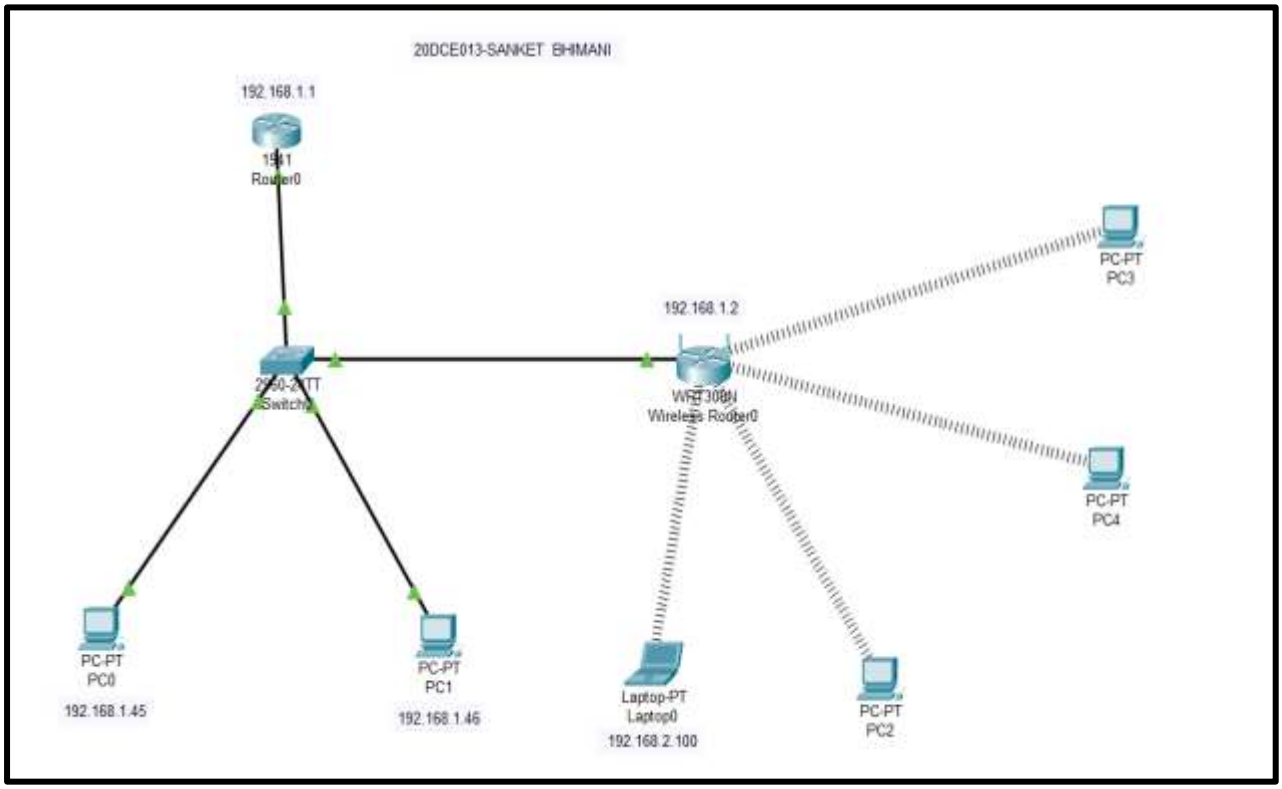


Fig 1.0

- In Fig 1.0 we describe whole structure of connection through wireless router to PC,laptop and switches.

1. Router Configuration:

- In which we are linked router.

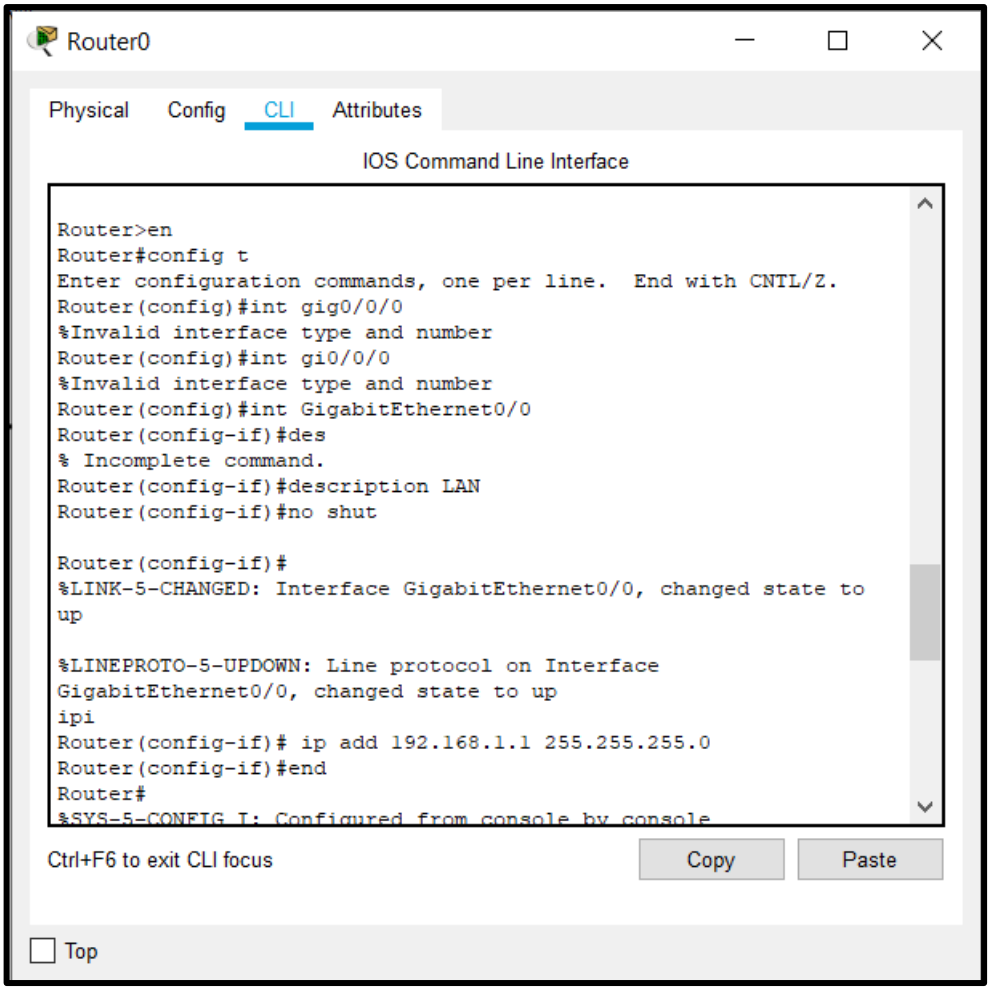


Fig 1.1

- Fig 1.1 describe link between router to switch configuration.

2 . Laptop Configuration:

- On laptop we need to select the Wireless Card and then check the ip address which we will be automatically gained from the wirless router.

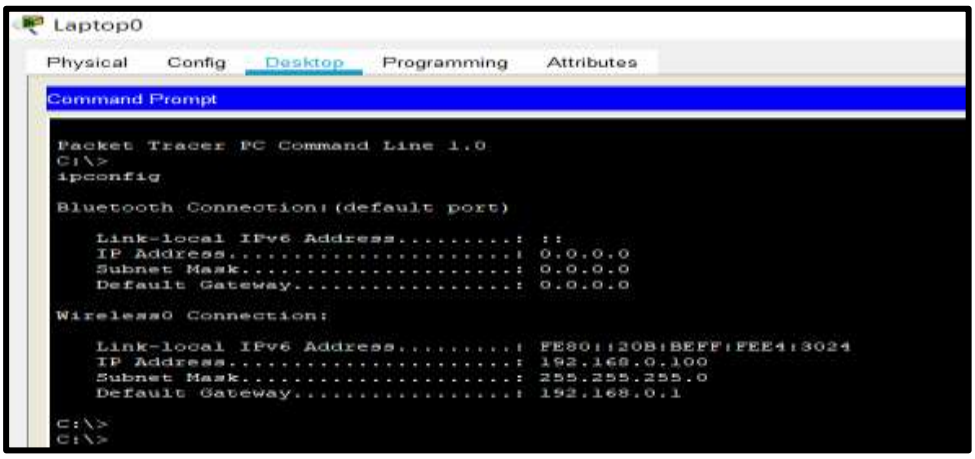
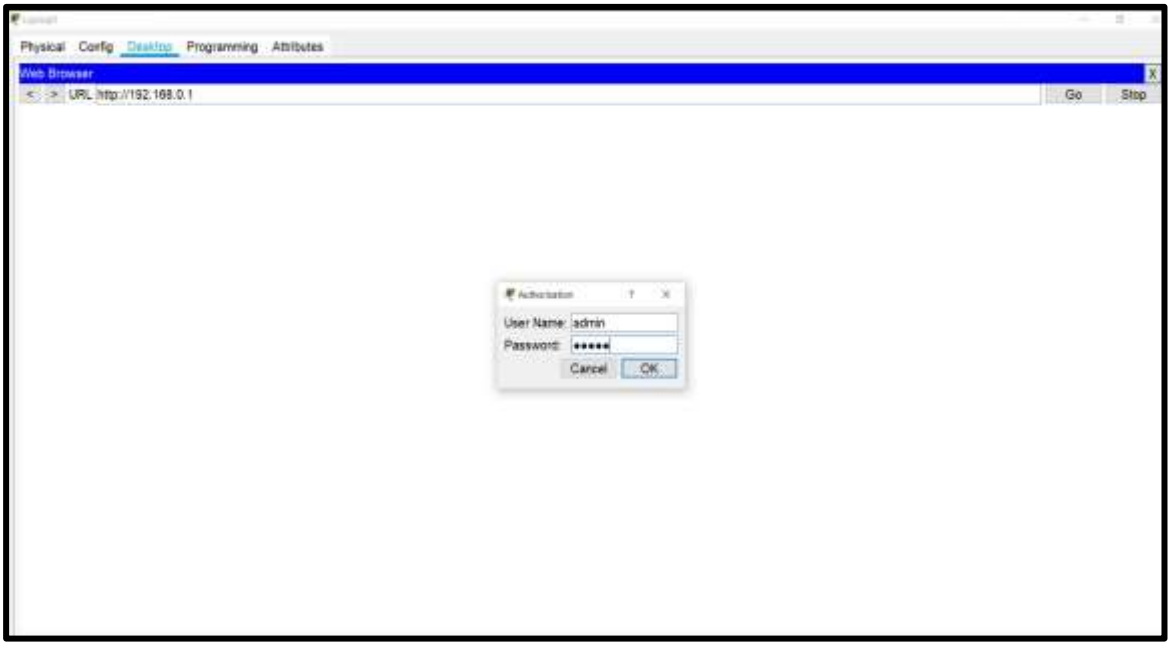
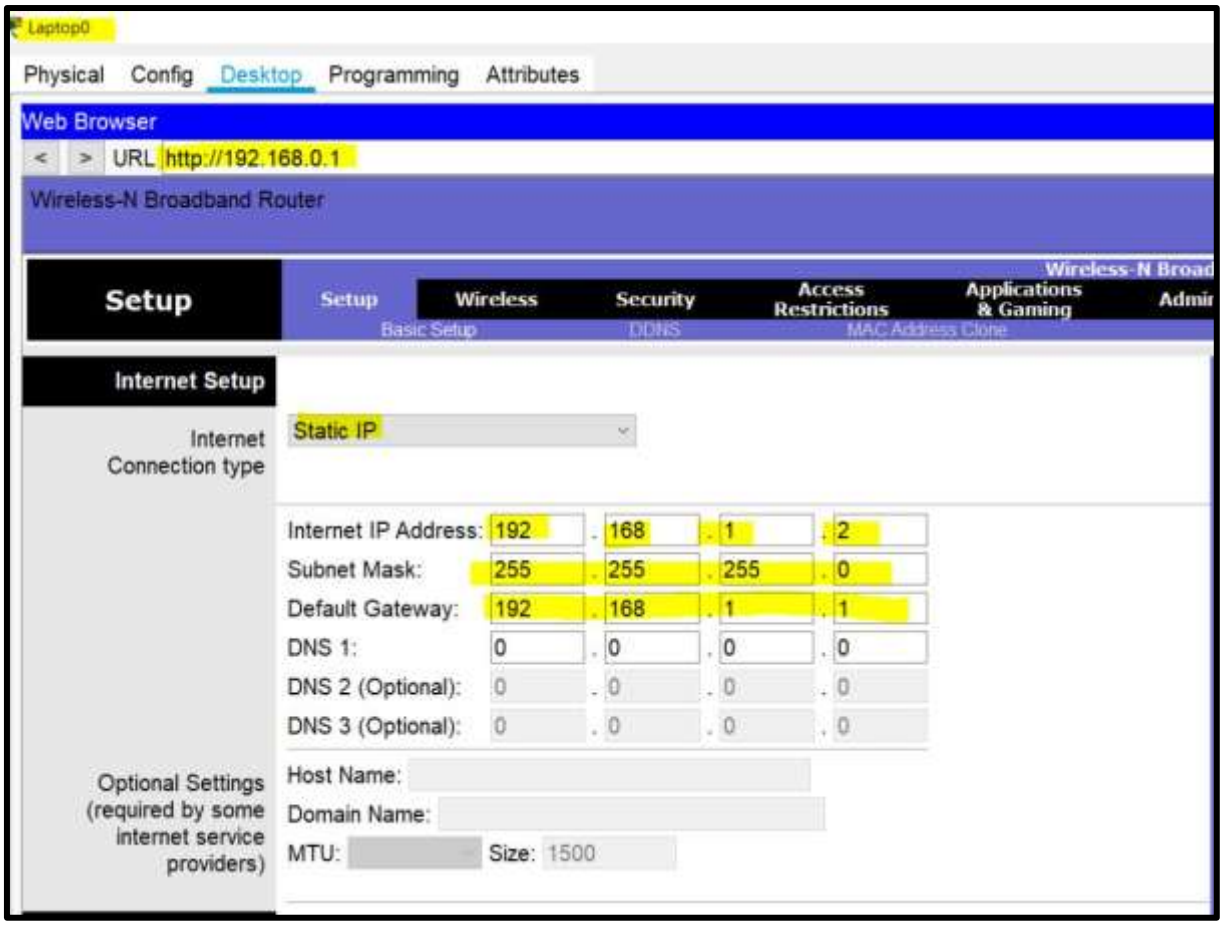


Fig 1.2

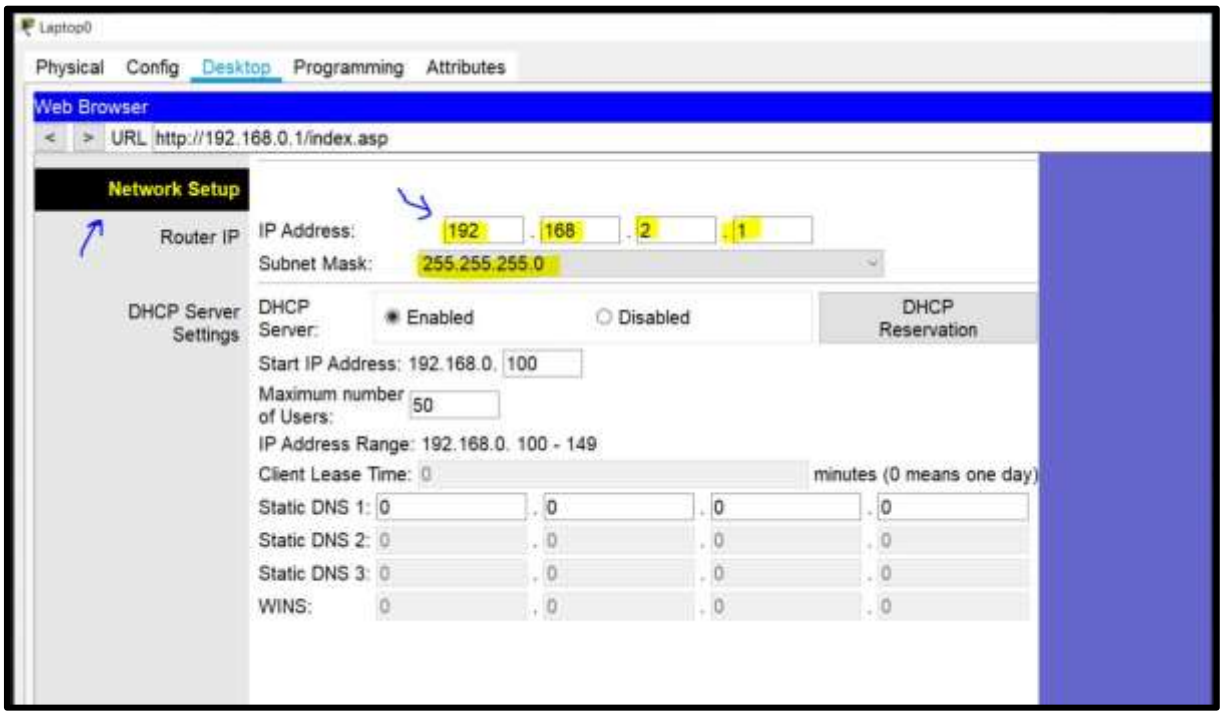
- Now we can connect the wireless router from the PC using the IP address is 192.168.0.1.
- Default username & password – admin.



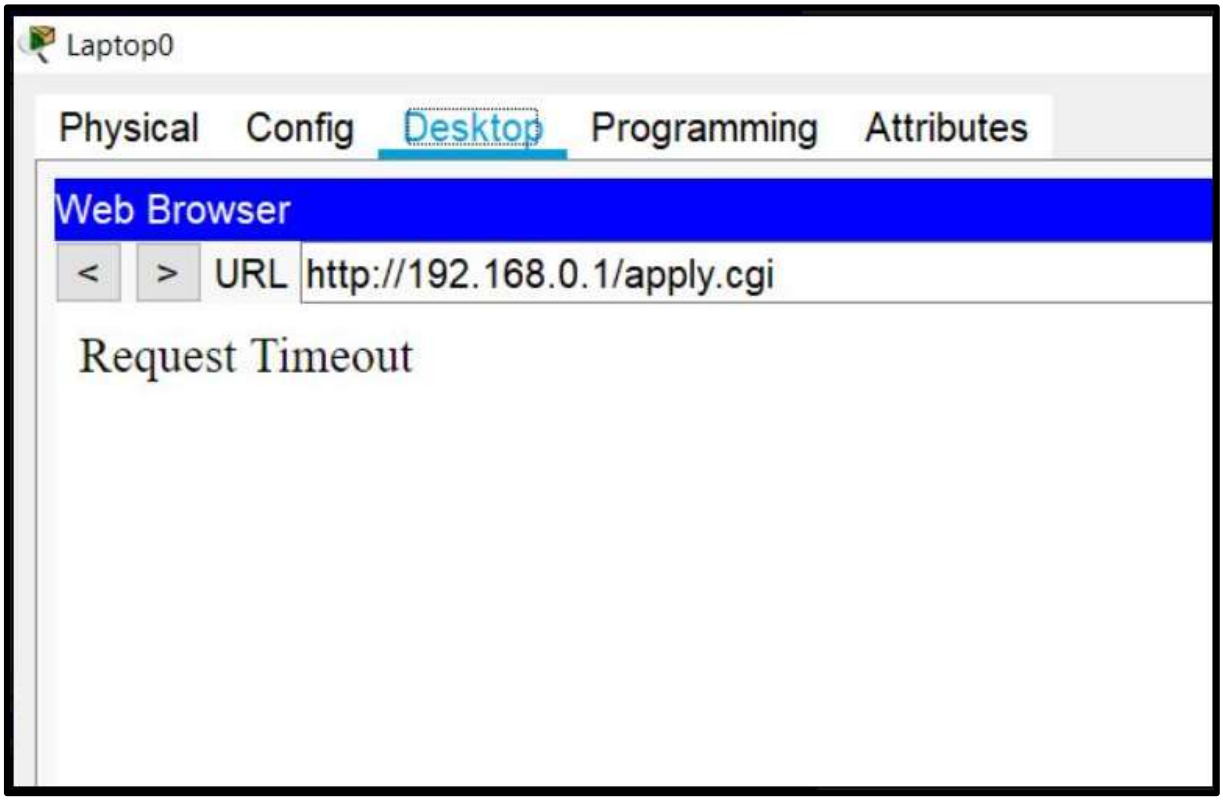
- Now change the WAN IP which is under Internet Setup.



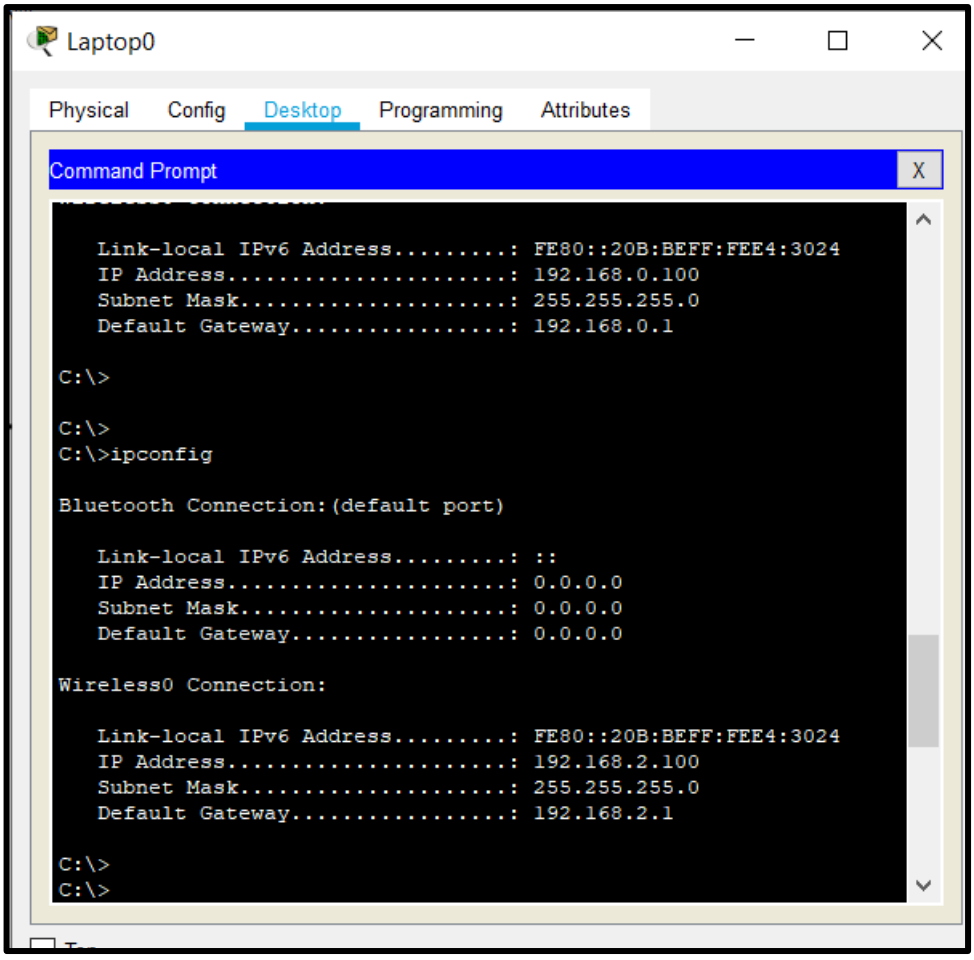
- Now lets change the LAN IP address under Network Setup.



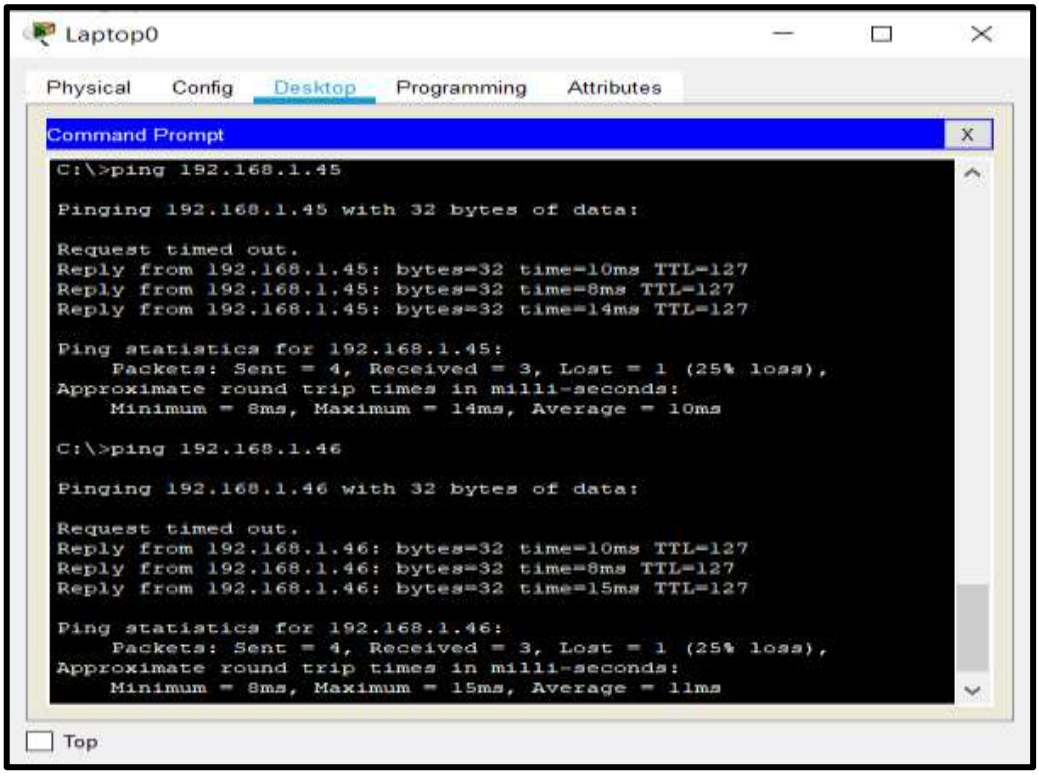
- This will interrupt the connection and we will get the timeout.



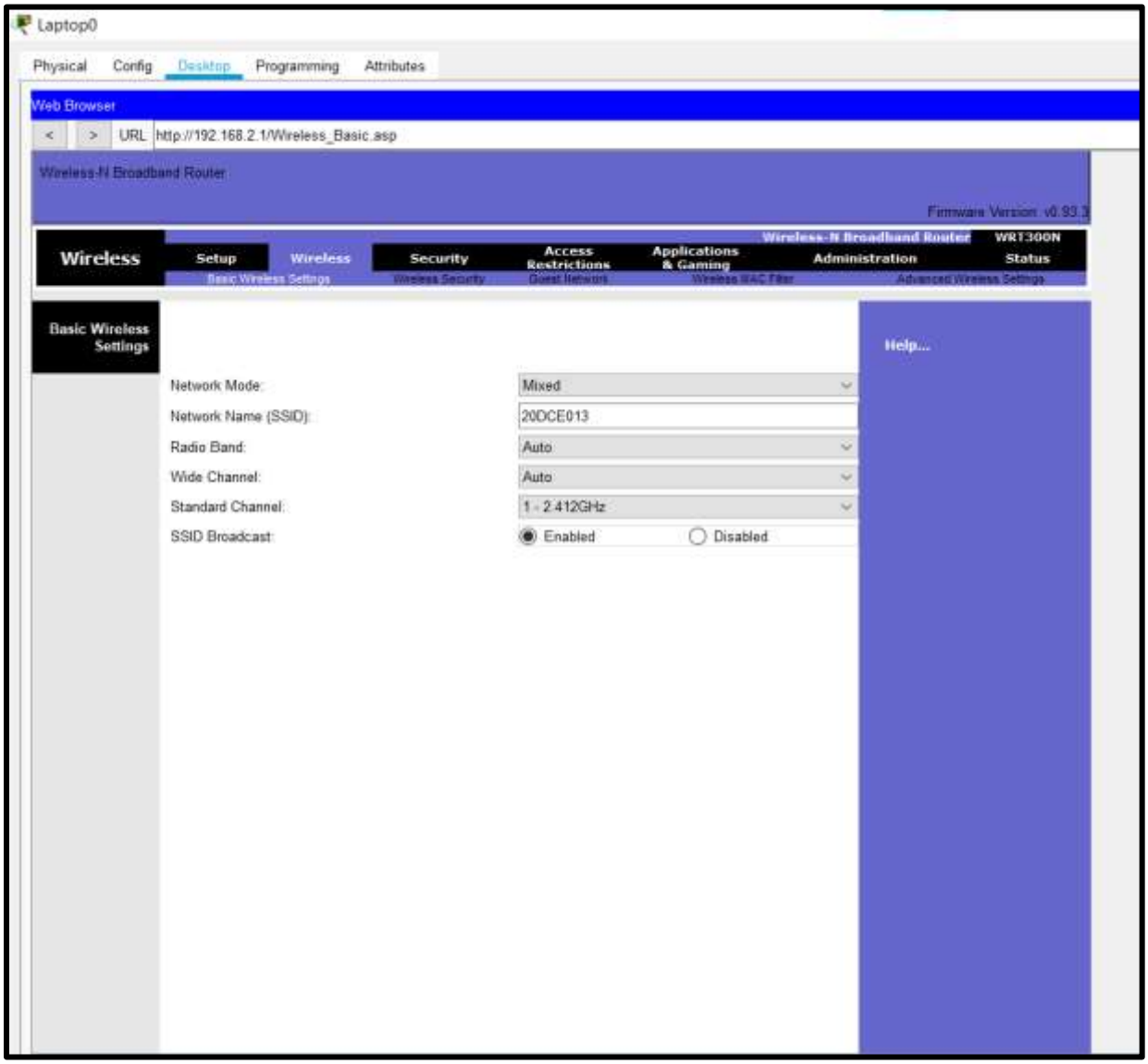
- Lets check if the laptop got the new address.

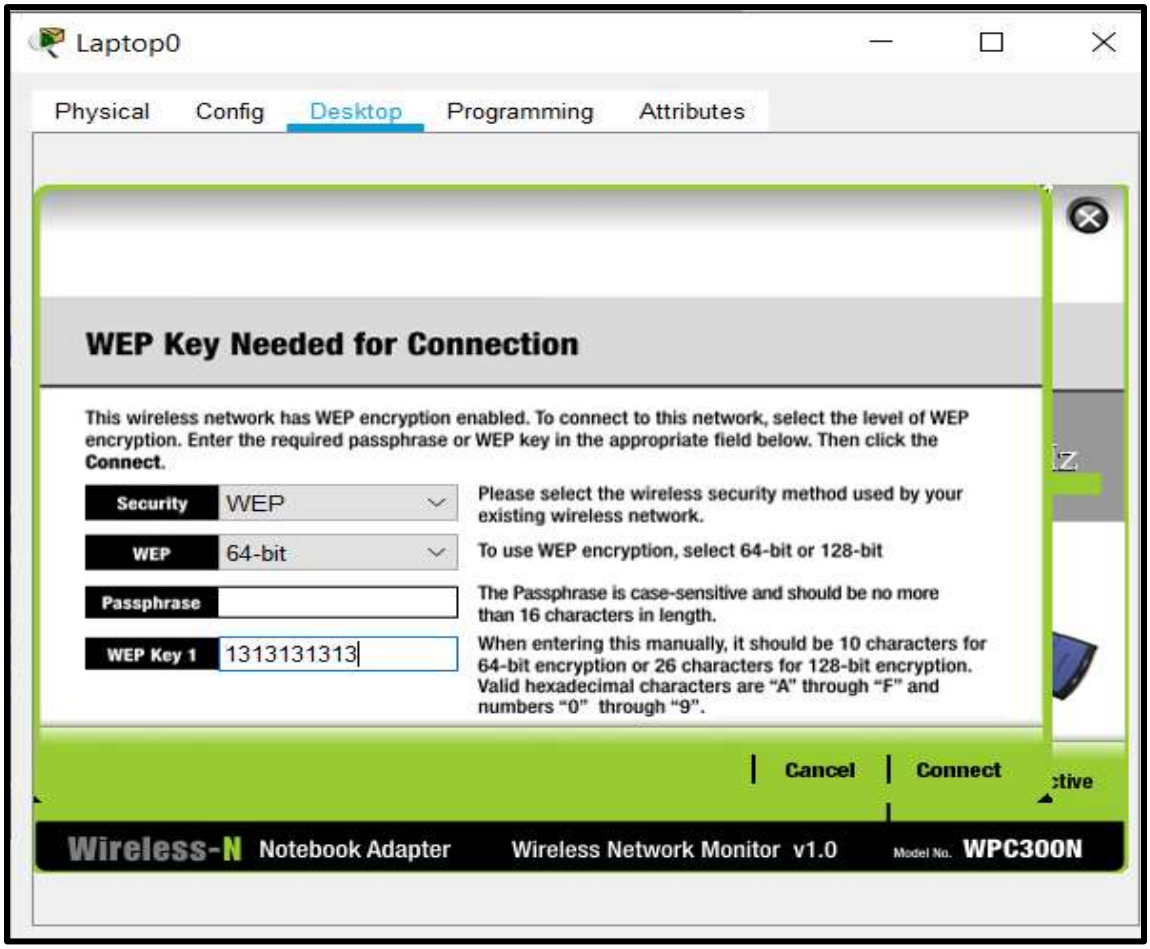


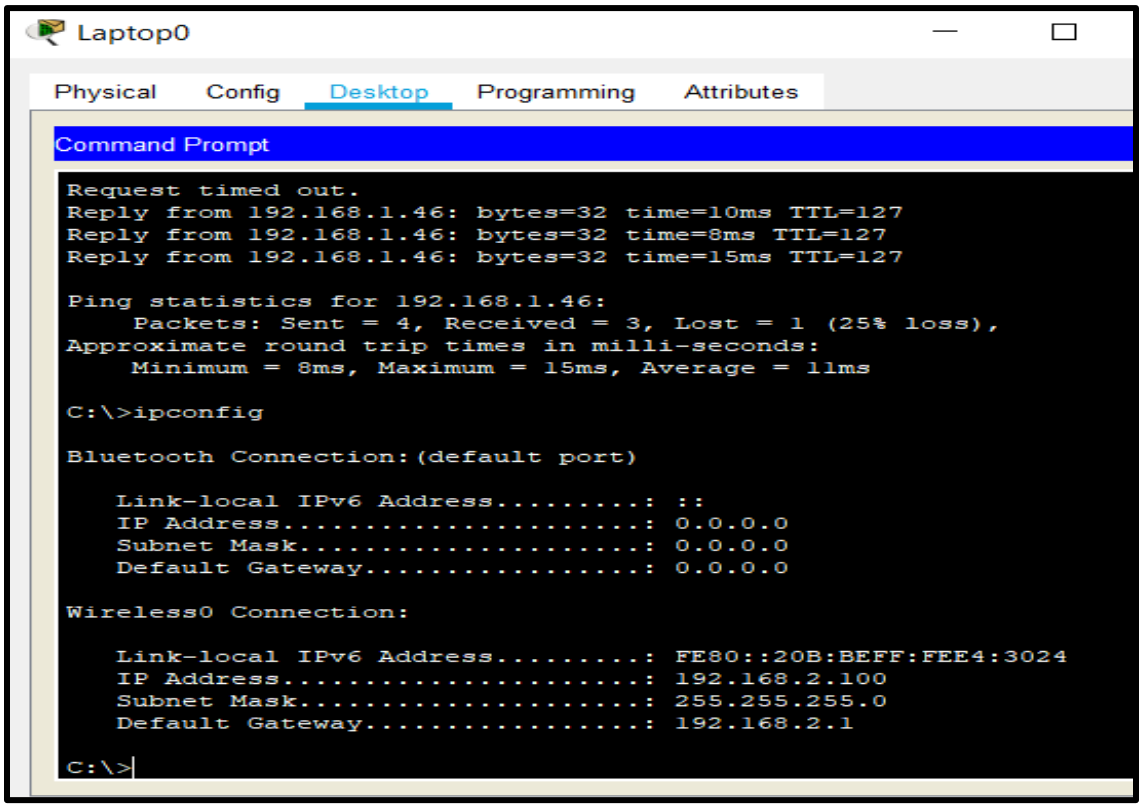
- After ping the PC0 and PC1.

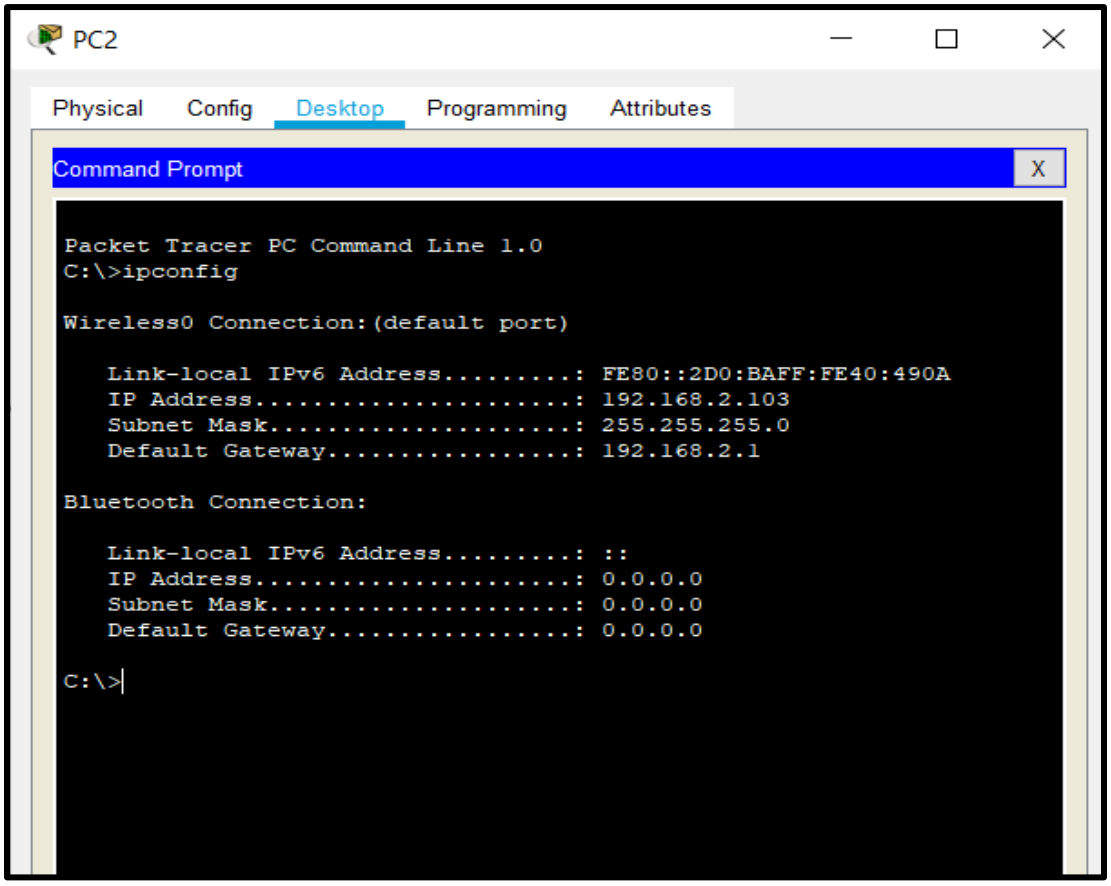


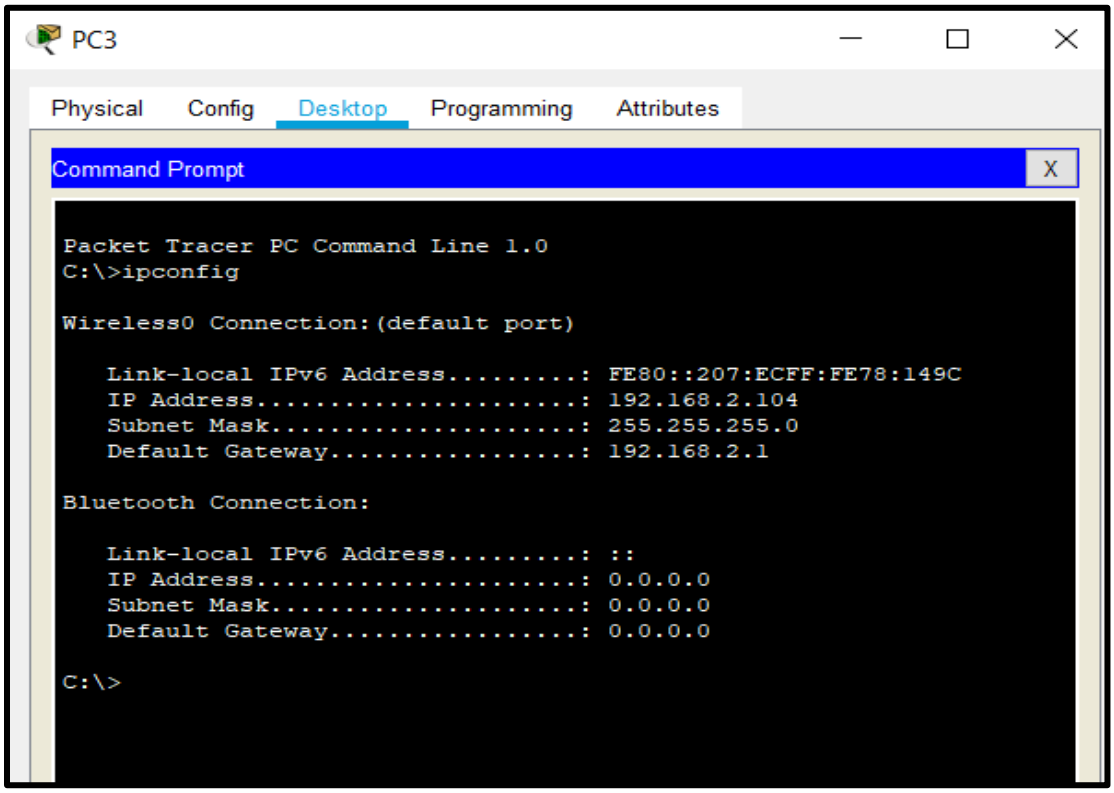
- Let change the Wireless router SSID and password.



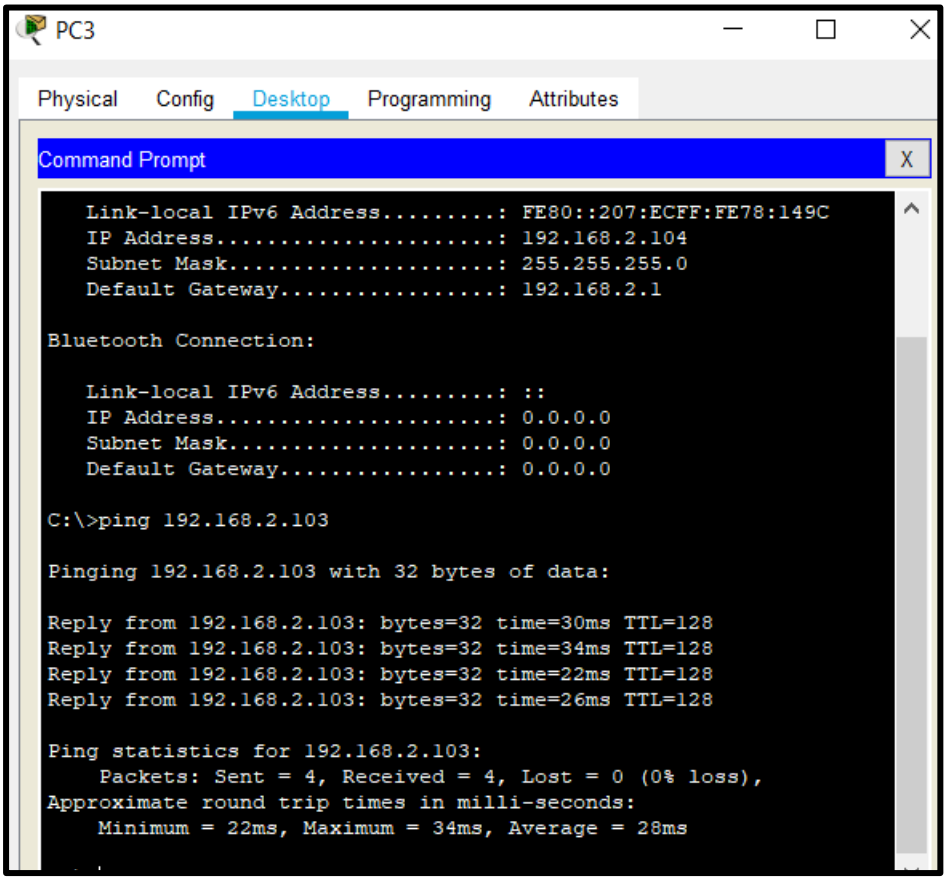

Laptop0
Physical
Config
Desktop
Programming
Attributes
WEP Key Needed for Connection
This wireless network has WEP encryption enabled. To connect to this network, select the level of WEP encryption. Enter the required passphrase or WEP key in the appropriate field below. Then click the Connect.
Security
WEP
Please select the wireless security method used by your existing wireless network.
WEP
64-bit
To use WEP encryption, select 64-bit or 128-bit
Passphrase
The Passphrase is case-sensitive and should be no more than 16 characters in length.
WEP Key 1
1313131313
When entering this manually, it should be 10 characters for 64-bit encryption or 26 characters for 128-bit encryption. Valid hexadecimal characters are "A" through "F" and numbers "0" through "9".
Cancel
Connect
Wireless-N Notebook Adapter
Wireless Network Monitor v1.0
Model No. WPC300N


Laptop0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Request timed out.
Reply from 192.168.1.46: bytes=32 time=10ms TTL=127
Reply from 192.168.1.46: bytes=32 time=8ms TTL=127
Reply from 192.168.1.46: bytes=32 time=15ms TTL=127
Ping statistics for 192.168.1.46:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 8ms, Maximum = 15ms, Average = 11ms
C:\>ipconfig
Bluetooth Connection:(default port)
Link-local IPv6 Address.....: ::
IP Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: 0.0.0.0
Wireless0 Connection:
Link-local IPv6 Address.....: FE80::20B:BEFF:FEE4:3024
IP Address.....: 192.168.2.100
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 192.168.2.1
C:\>

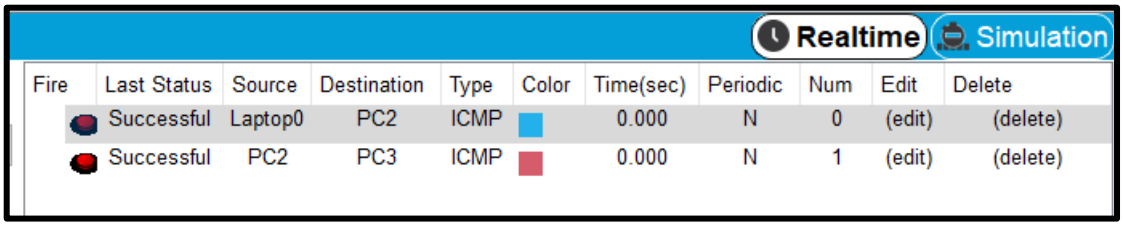

PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ipconfig
Wireless0 Connection:(default port)
Link-local IPv6 Address.....: FE80::2D0:BAFF:FE40:490A
IP Address.....: 192.168.2.103
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 192.168.2.1
Bluetooth Connection:
Link-local IPv6 Address.....: ::
IP Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: 0.0.0.0
C:\>


PC3
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ipconfig
Wireless0 Connection:(default port)
Link-local IPv6 Address.....: FE80::207:ECFF:FE78:149C
IP Address.....: 192.168.2.104
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 192.168.2.1
Bluetooth Connection:
Link-local IPv6 Address.....: ::
IP Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: 0.0.0.0
C:\>

- Now lets ping PC2 from PC3.



- Now Communication are establish between PC2 and PC3 through wireless router.
- Now we send message from PC2 to PC3.



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop0	PC2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC2	PC3	ICMP		0.000	N	1	(edit)	(delete)

Conclusion: In this practical we are understood how many types for cables and cable connector are required to network establishment and how to configure wifi setup using wireless router.