

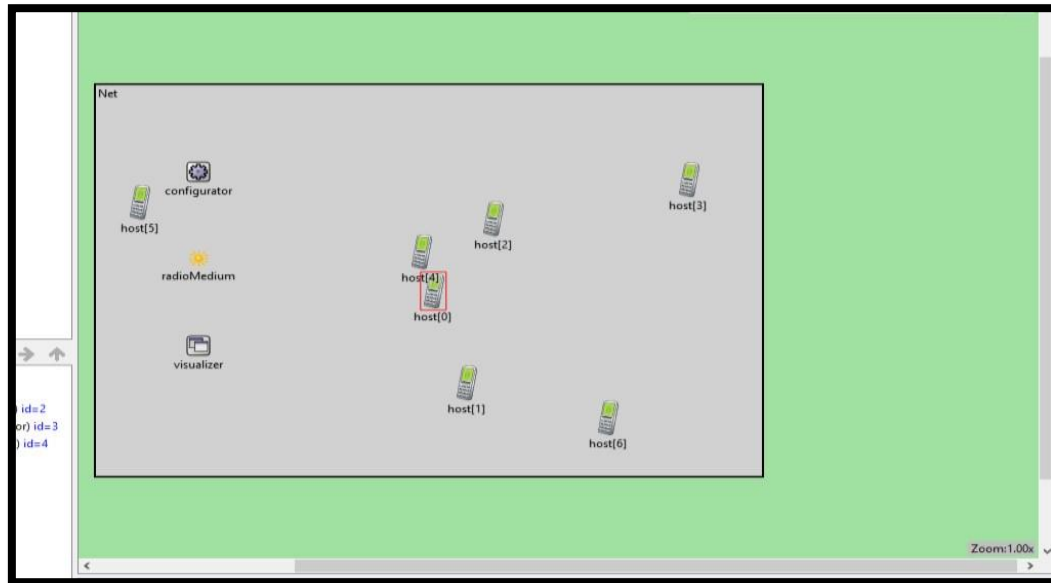
## PRACTICAL NO. 4

**AIM :-**

**THEORY :-**

## OUTPUT :-

The following simulation has 7 hosts

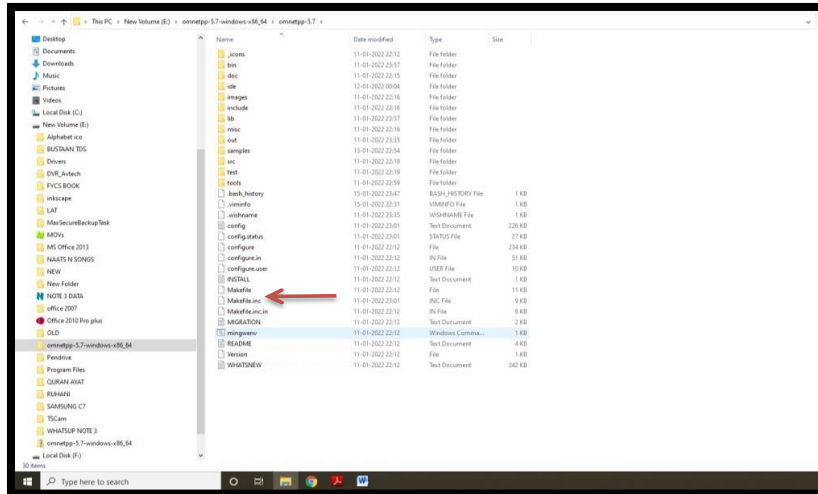


# Create and simulate a simple ad hoc network

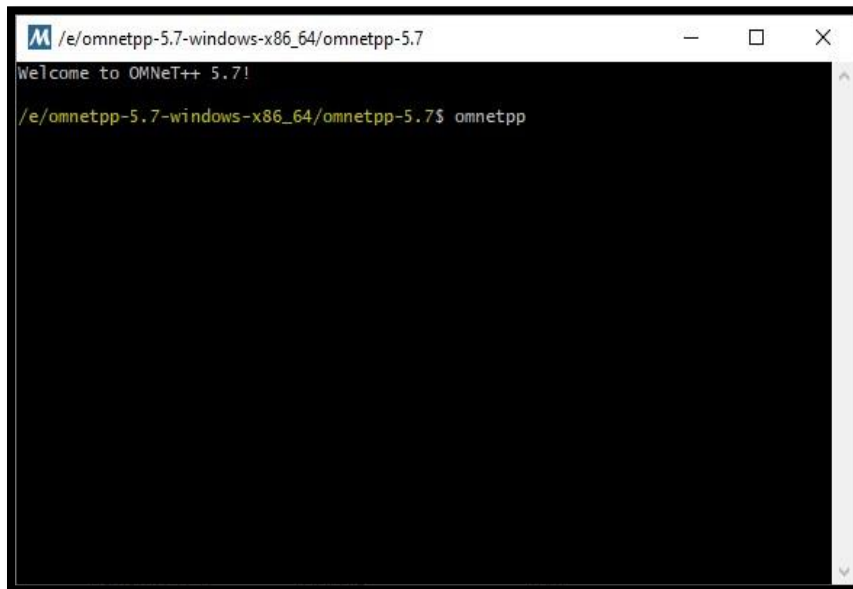
## STEPS :

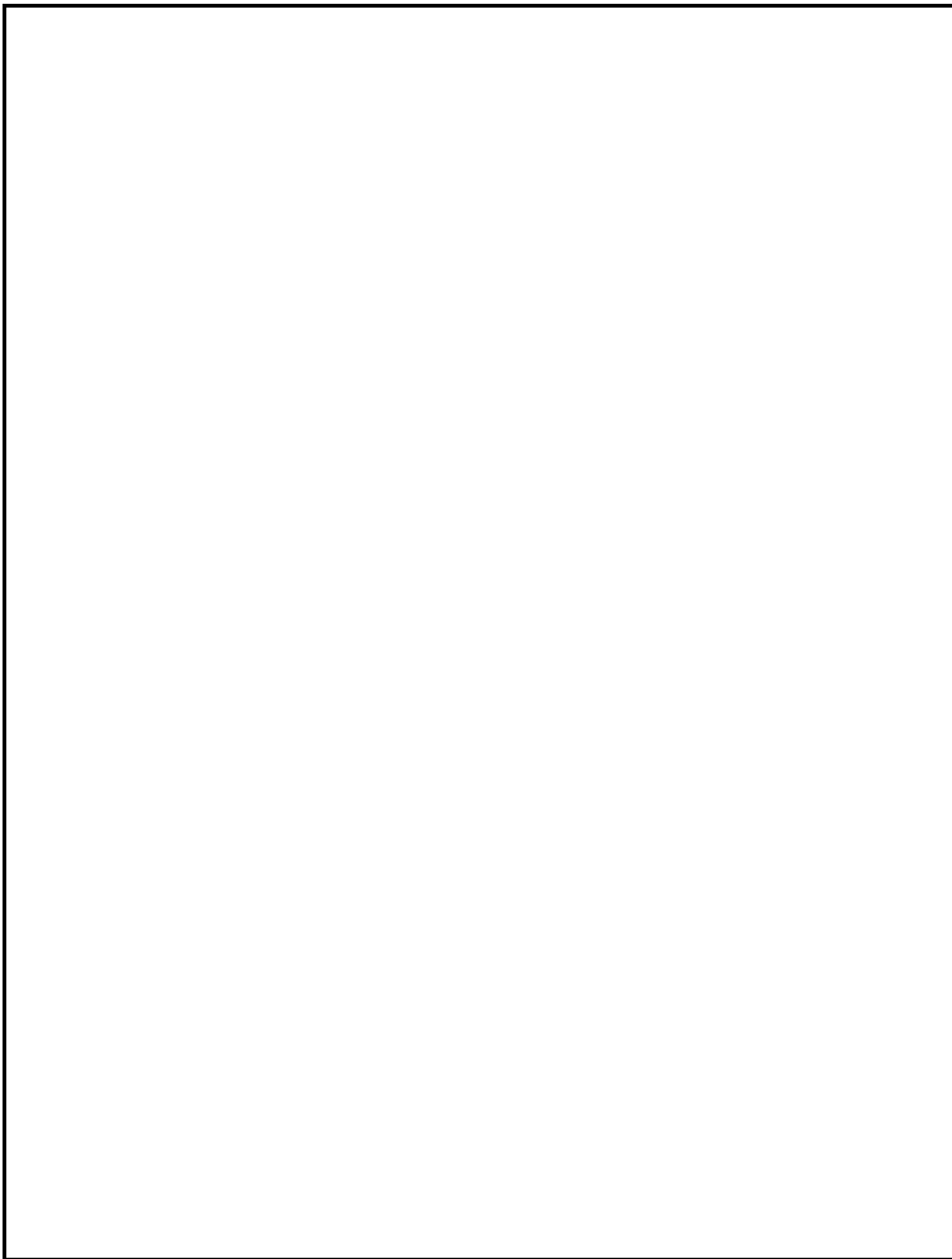
Step 1: Start the Omnetpp simulator through the following procedure

Click on the file mingw env

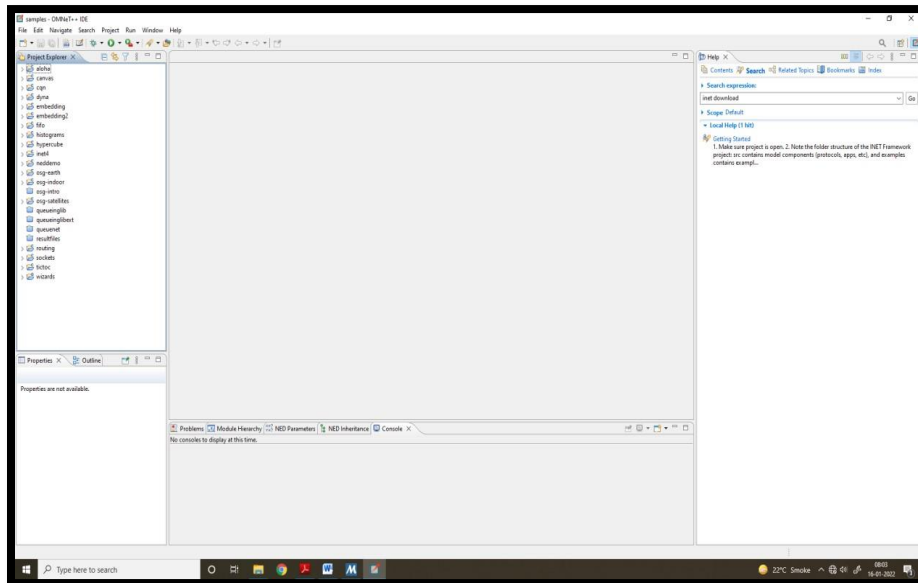


We will get the following \$ prompt, type omnetpp and enter

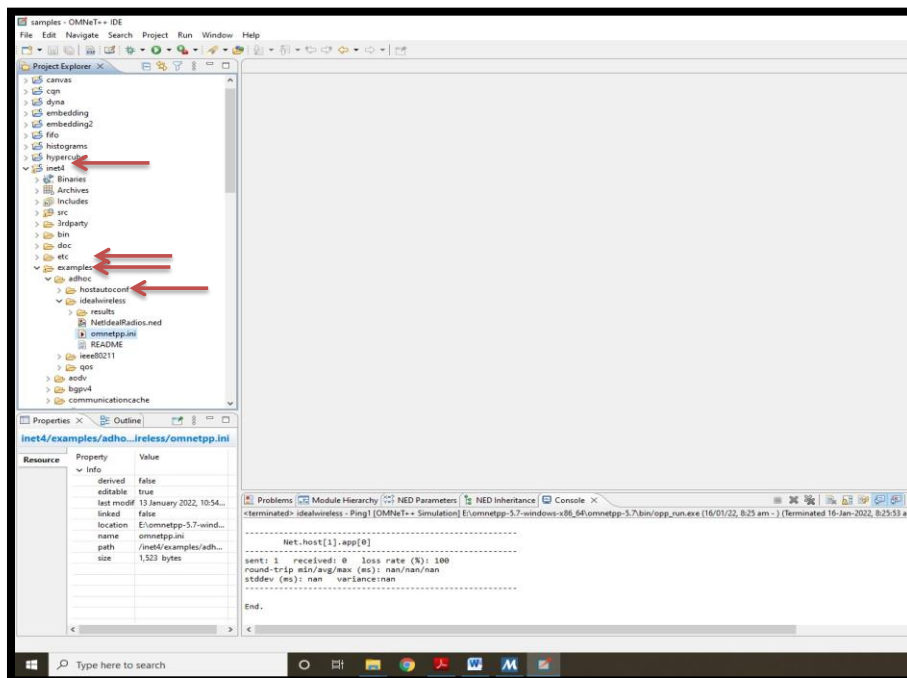


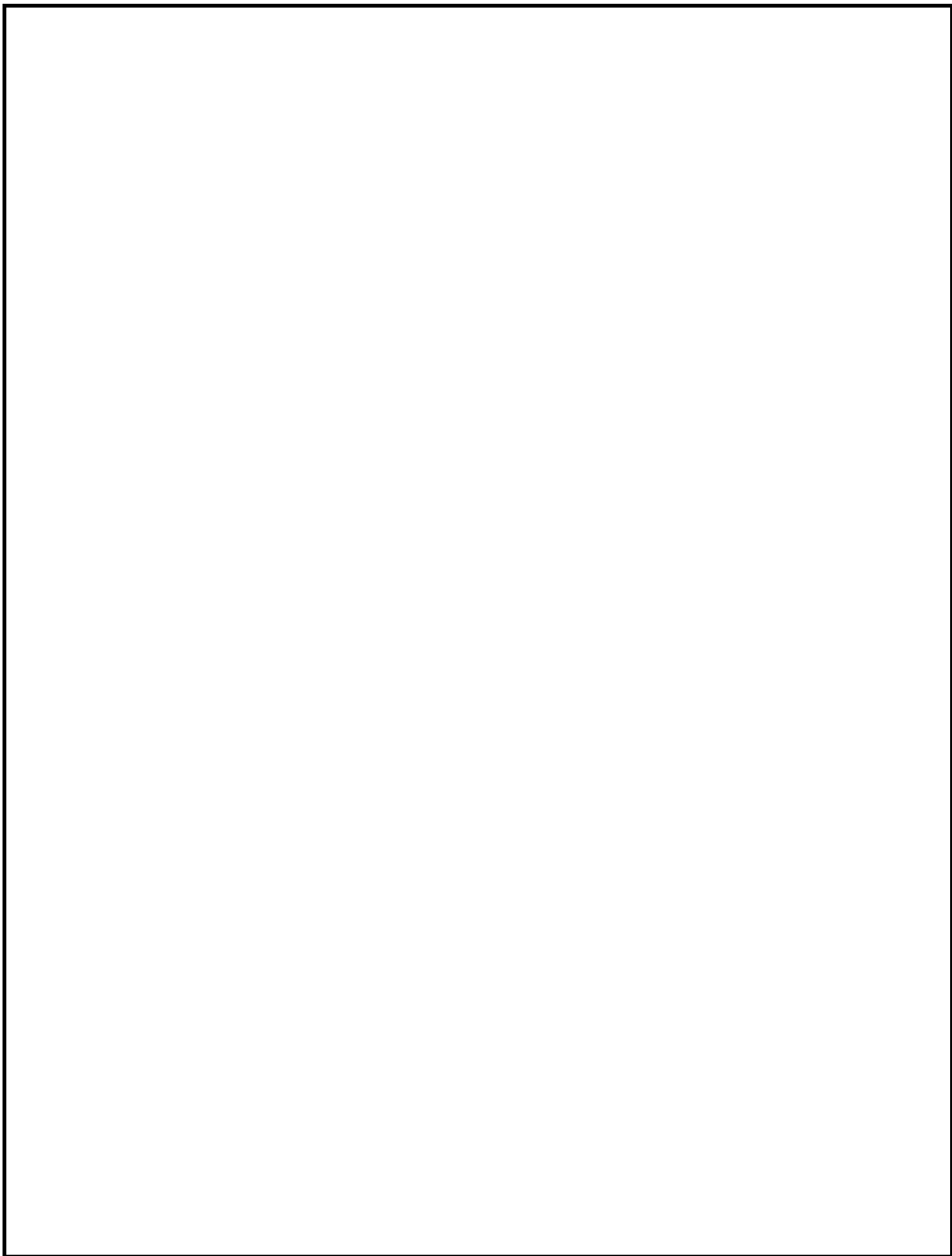


Step 2: The omnetpp simulator is now ready with the following user interface

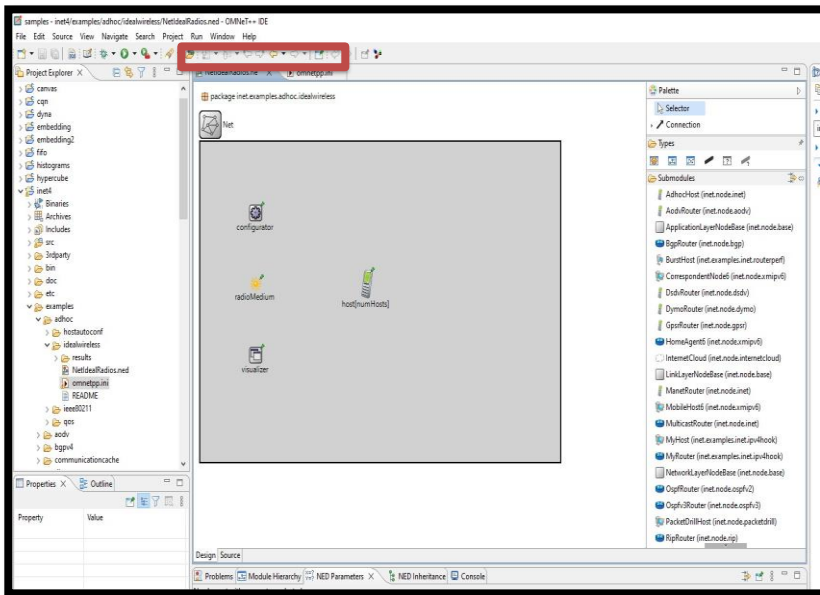


Click on inet folder, then in it click on examples, then on adhoc and then on idealwireless as given

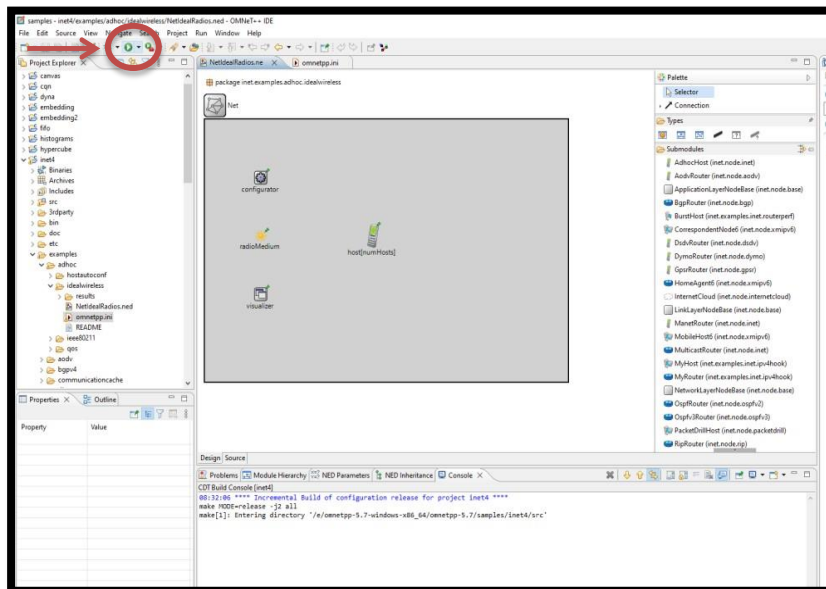


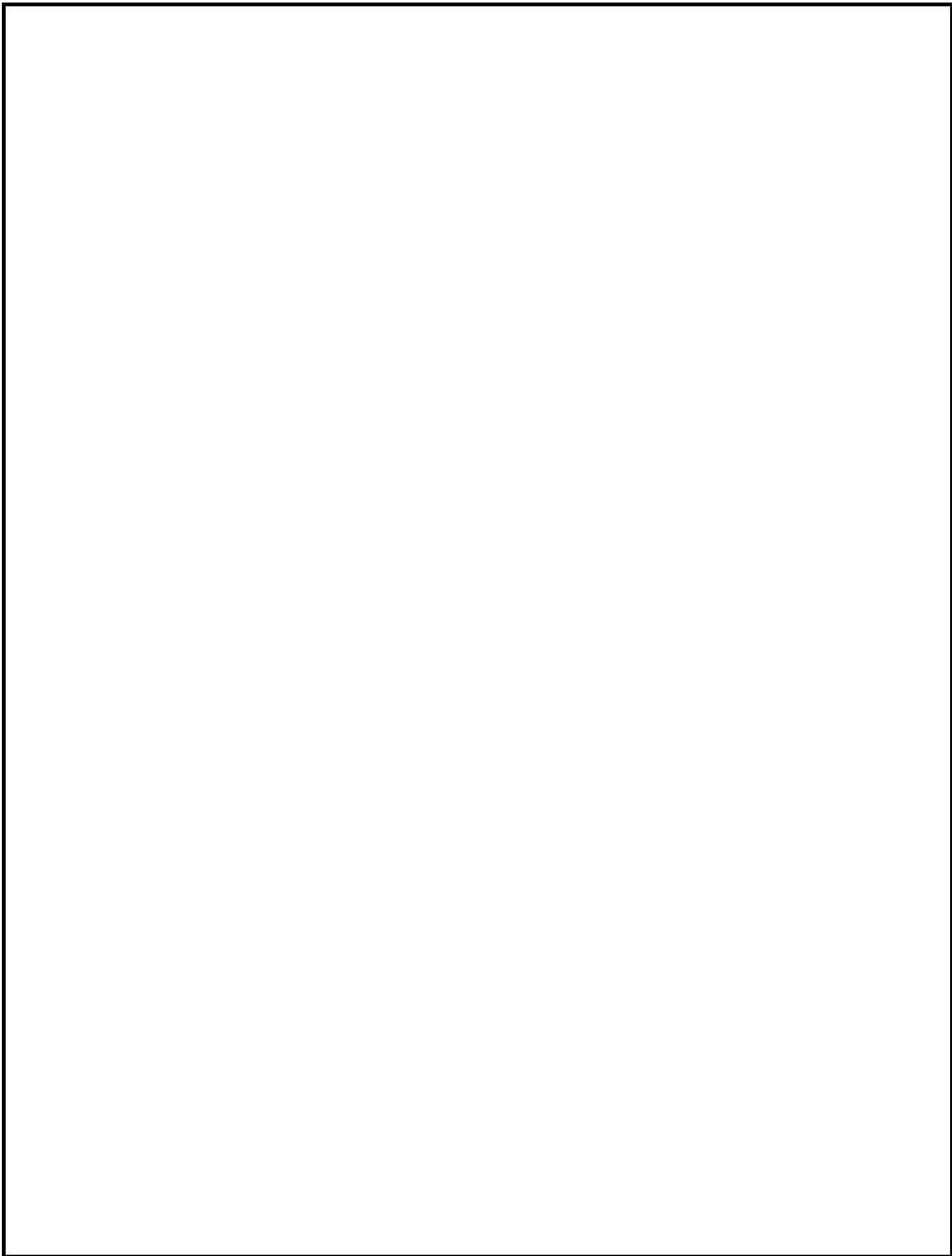


Step 3: In order to load the simulation, double click on two files NetIdealRadios.ned and omnetpp.ini



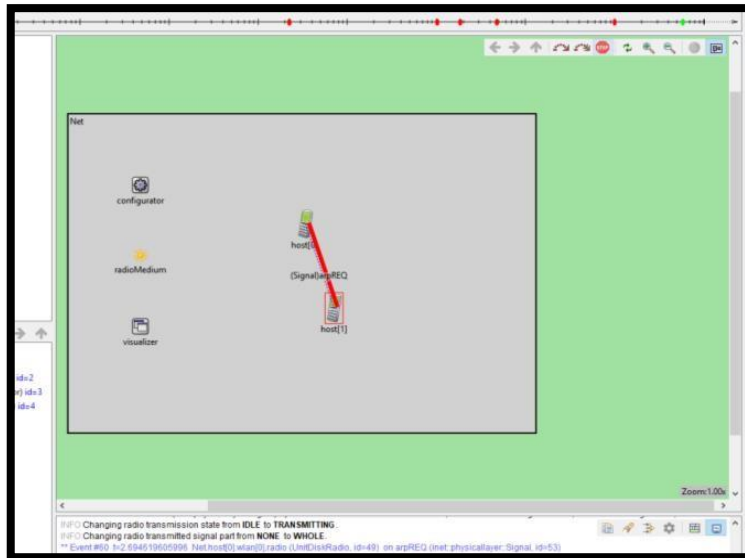
Step 4: Now we run the simulation



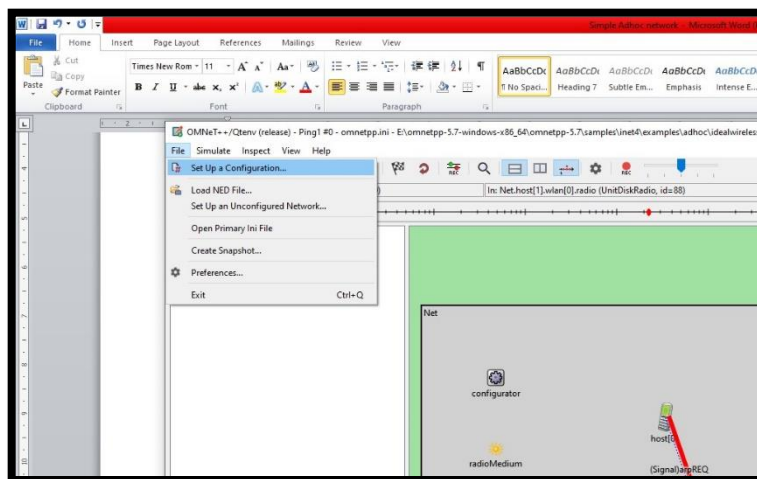




Step 5: After running the simulation we get the following

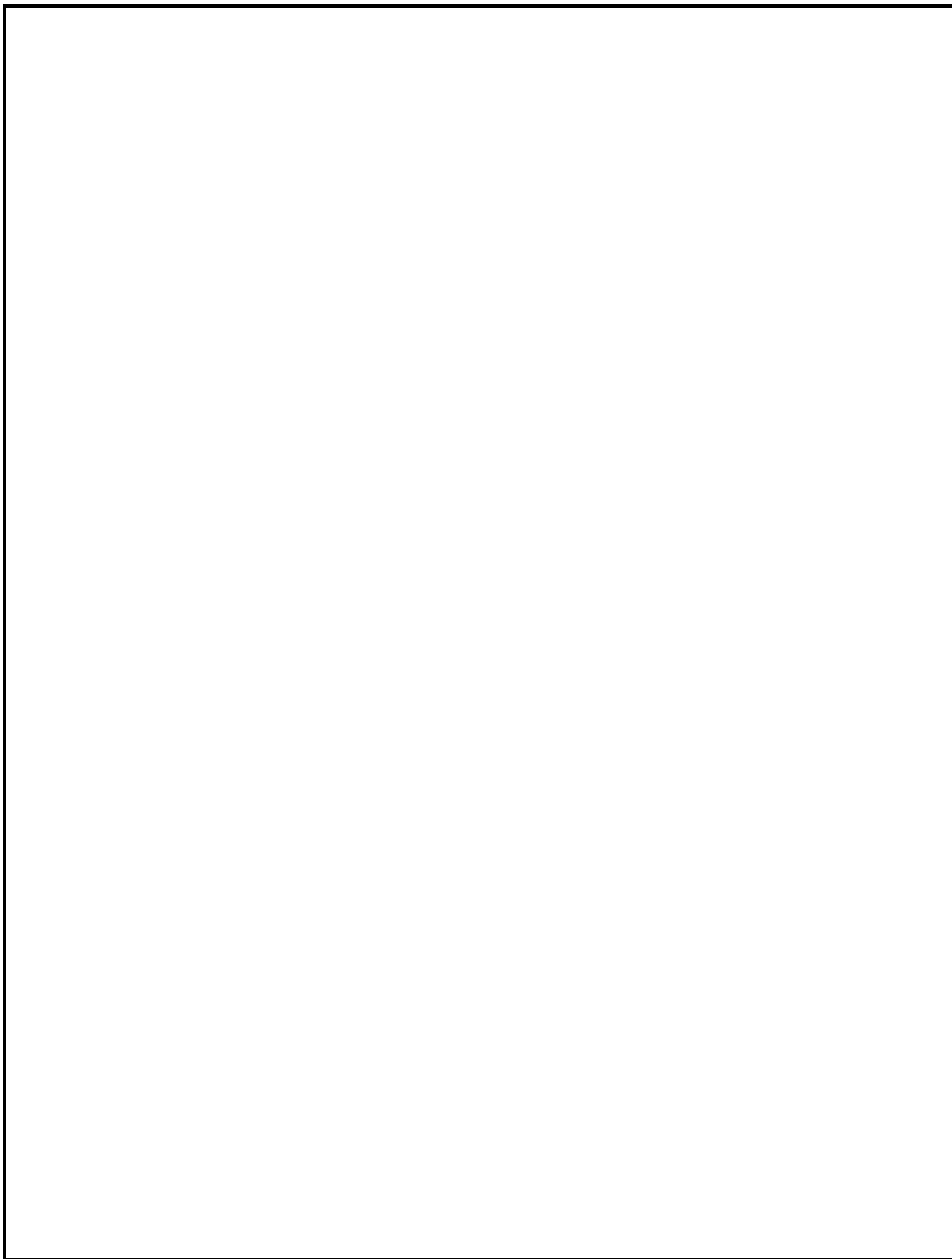


The number of hosts can be increased by the following



In this we get a dropdown menu, select n host option and enter the required hosts

**CONCLUSION :-**



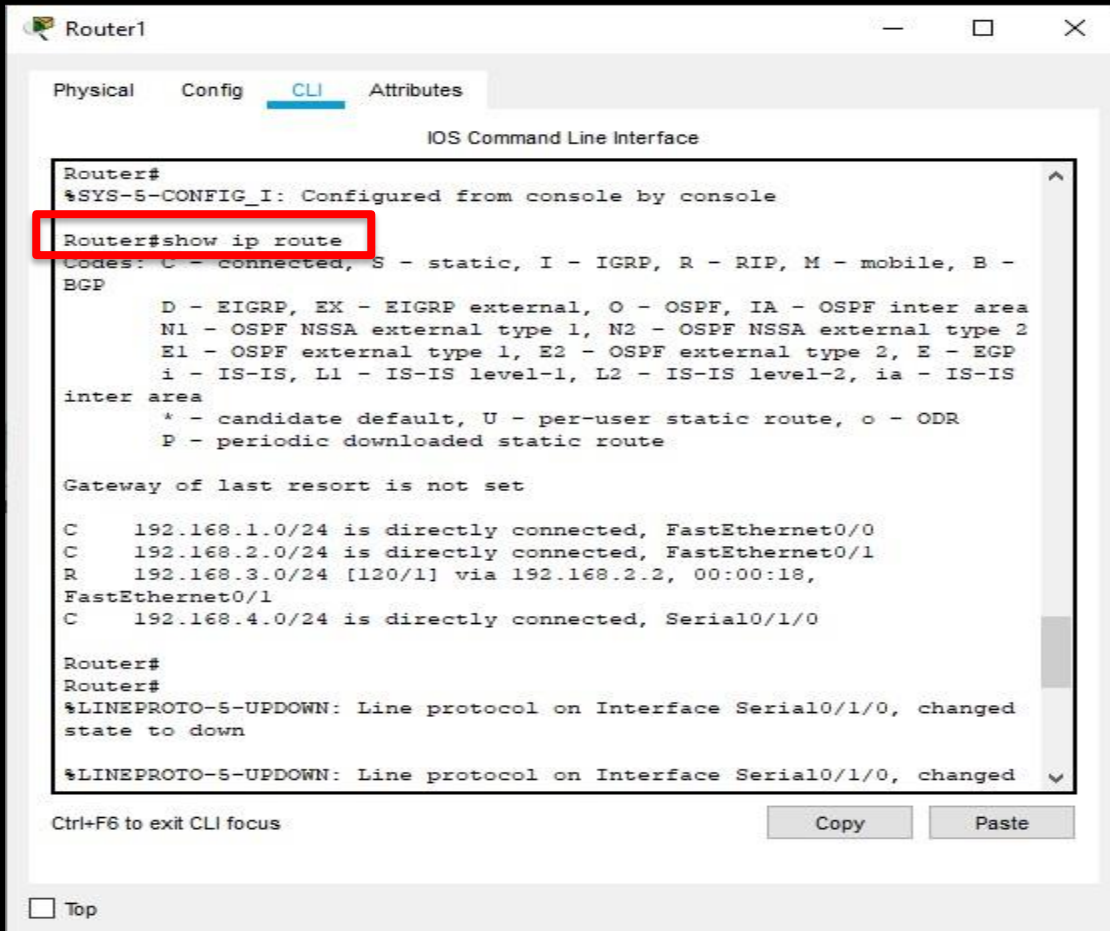
## PRACTICAL NO. 5

**AIM :-**

**THEORY :-**

## OUTPUT :-

The following command is executed in the CLI mode of Router1



The screenshot shows a window titled "Router1" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The command "Router#show ip route" is entered and highlighted with a red box. The output shows the router's routing table, including directly connected networks and a static route. The command prompt "Router#" is repeated at the bottom of the output.

```
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/1
R    192.168.3.0/24 [120/1] via 192.168.2.2, 00:00:18,
FastEthernet0/1
C    192.168.4.0/24 is directly connected, Serial0/1/0

Router#
Router#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to down

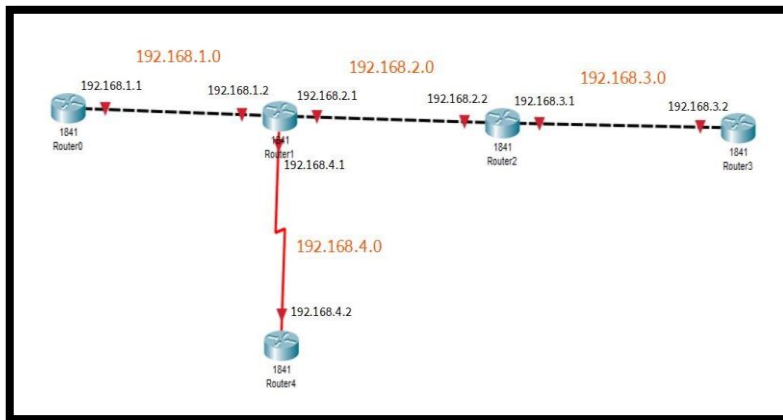
Ctrl+F6 to exit CLI focus
```

## Reading and Analyzing Routing Table of a network

### STEPS :-

Step 1 : Consider the following topology

Network destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.0.1	192.168.0.100	10
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
192.168.0.0	255.255.255.0	192.168.0.100	192.168.0.100	10
192.168.0.100	255.255.255.255	127.0.0.1	127.0.0.1	10
192.168.0.1	255.255.255.255	192.168.0.100	192.168.0.100	10



The ip addresses are configured on the given interfaces of the Routers.

The Routing path is also set using RIP.

We get the following Routing information from Router1

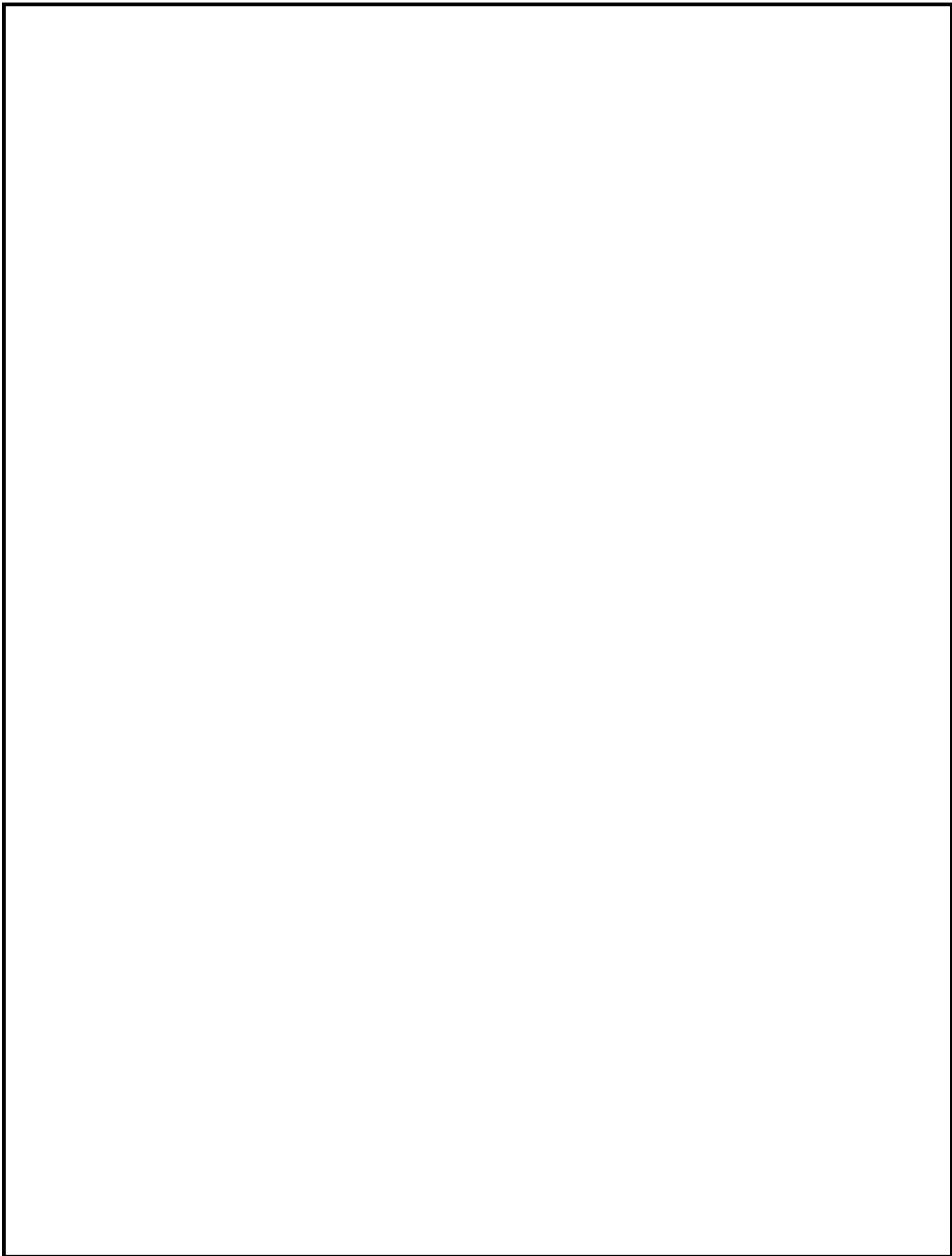
C 192.168.1.0/24 is directly connected, FastEthernet0/0

C 192.168.2.0/24 is directly connected, FastEthernet0/1

R 192.168.3.0/24 [120/1] via 192.168.2.2, 00:00:18, FastEthernet0/1

C 192.168.4.0/24 is directly connected, Serial0/1/0

### CONCLUSION :-

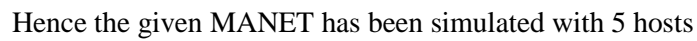


## PRACTICAL NO. 6

**AIM :-**

**THEORY :-**

Since the nodes have mobility, after sometime their positions would change and we get

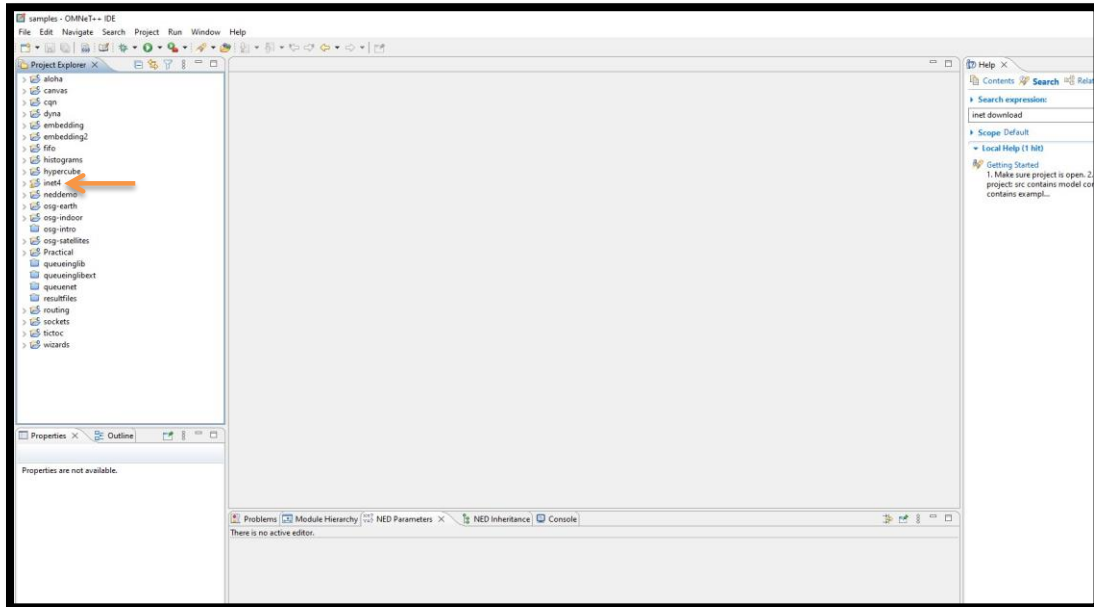




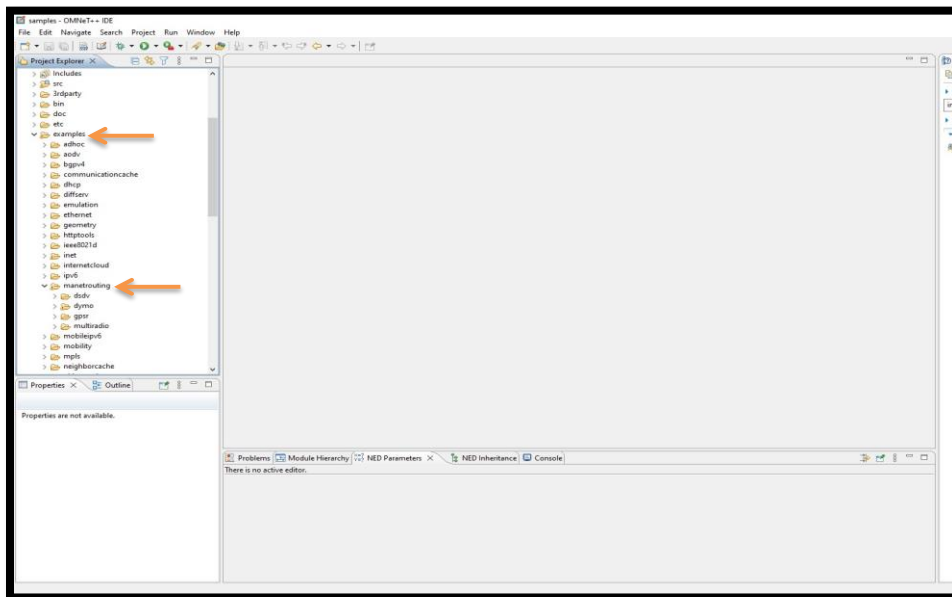
# MANET implementation simulation

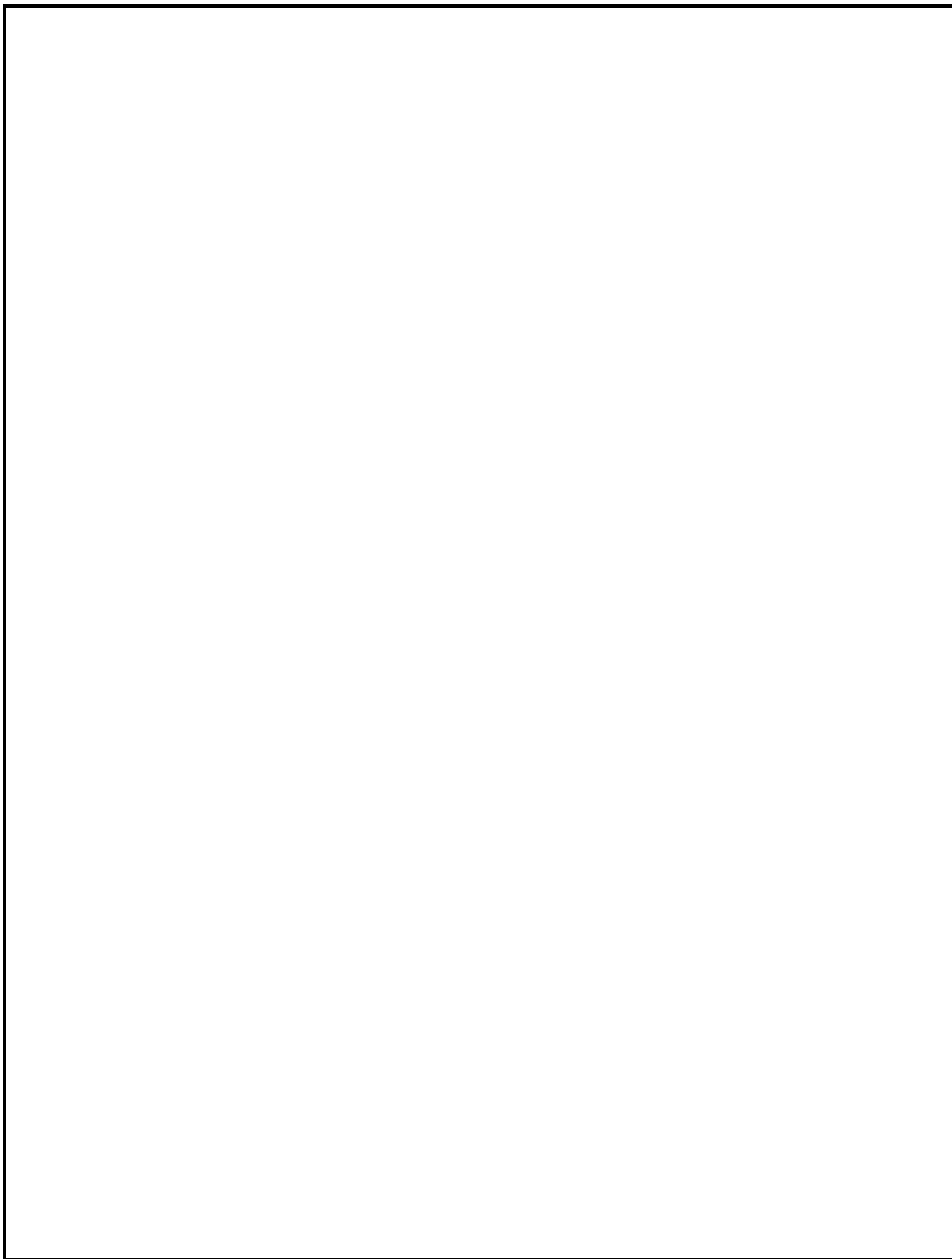
## STEPS :-

Step 1: Open the Omnet++ software and click on inet4 folder

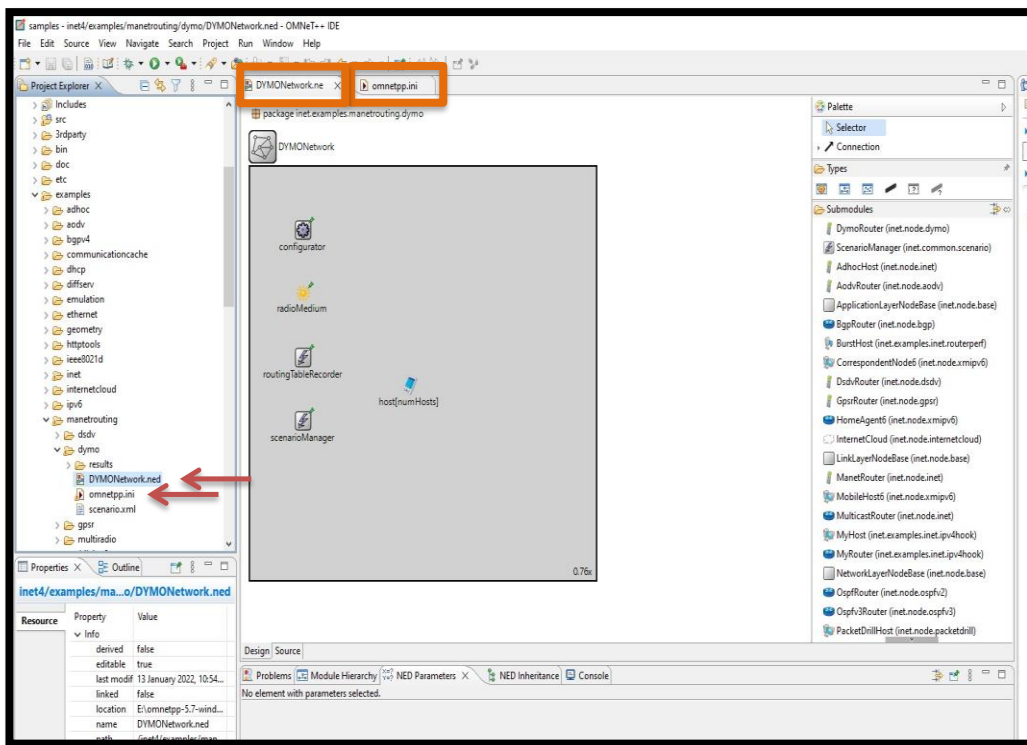


Step 2: Now select the examples folder and then in that folder select manetrouting folder

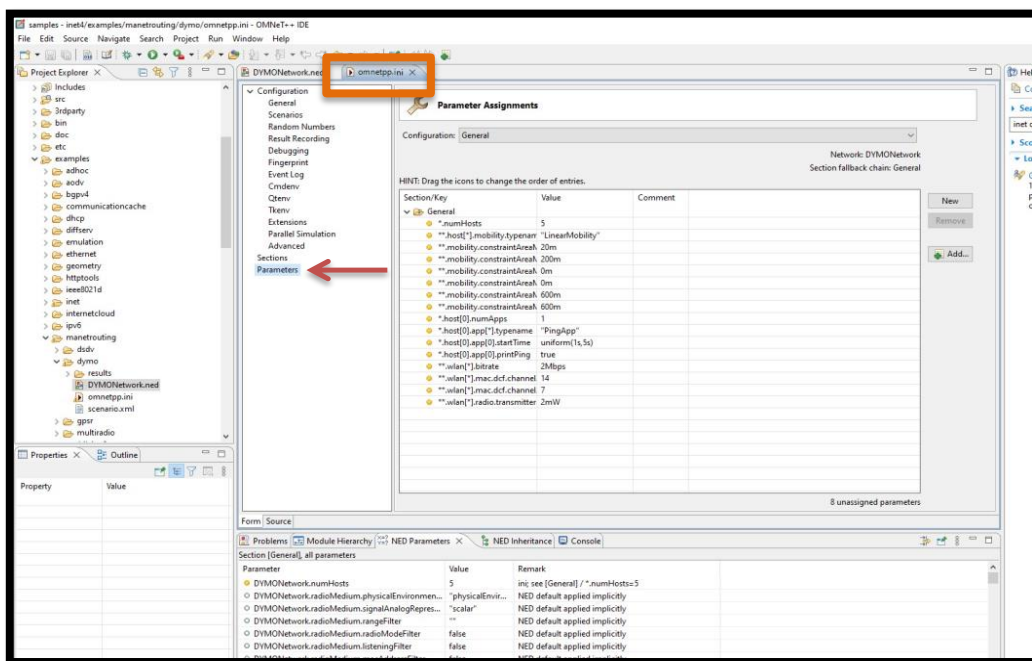


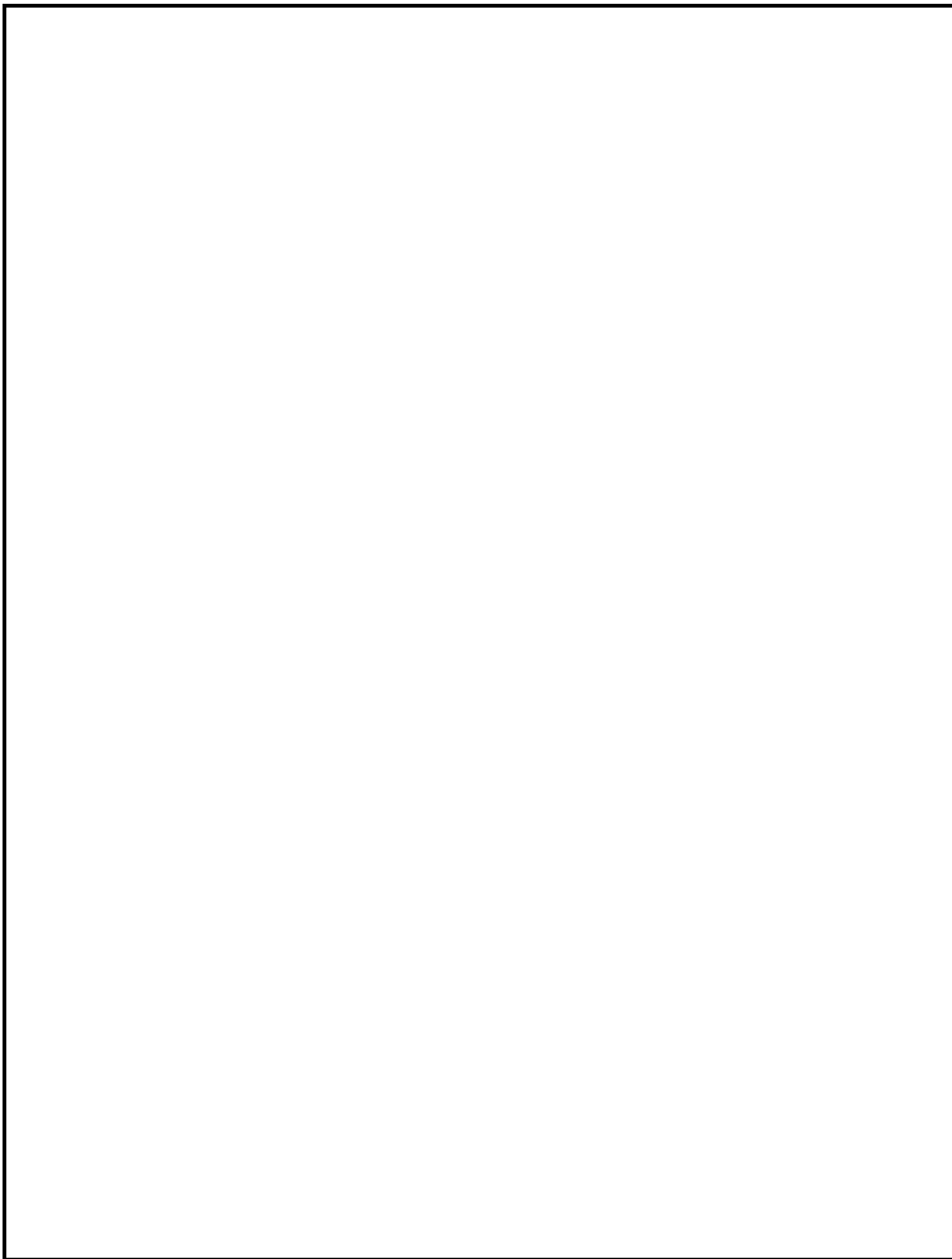


Step 3 : In manetrouting folder click dymo folder and then load the DYMONetwork.ned and omnetpp.ini files by double clicking

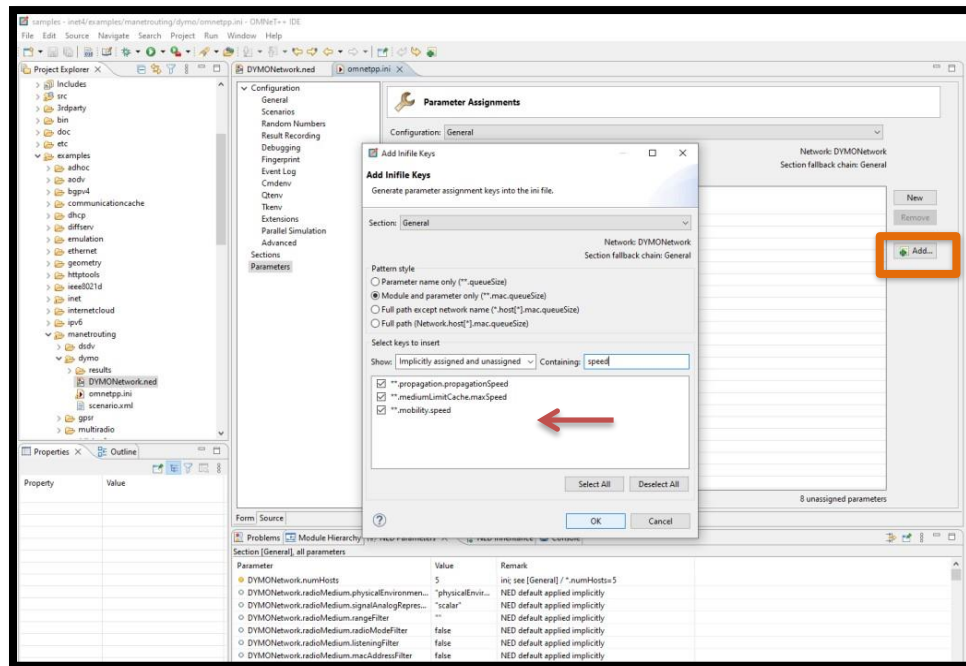


Step 4: Select omnetpp.ini file and click on parameters, we need to add mobility to the nodes

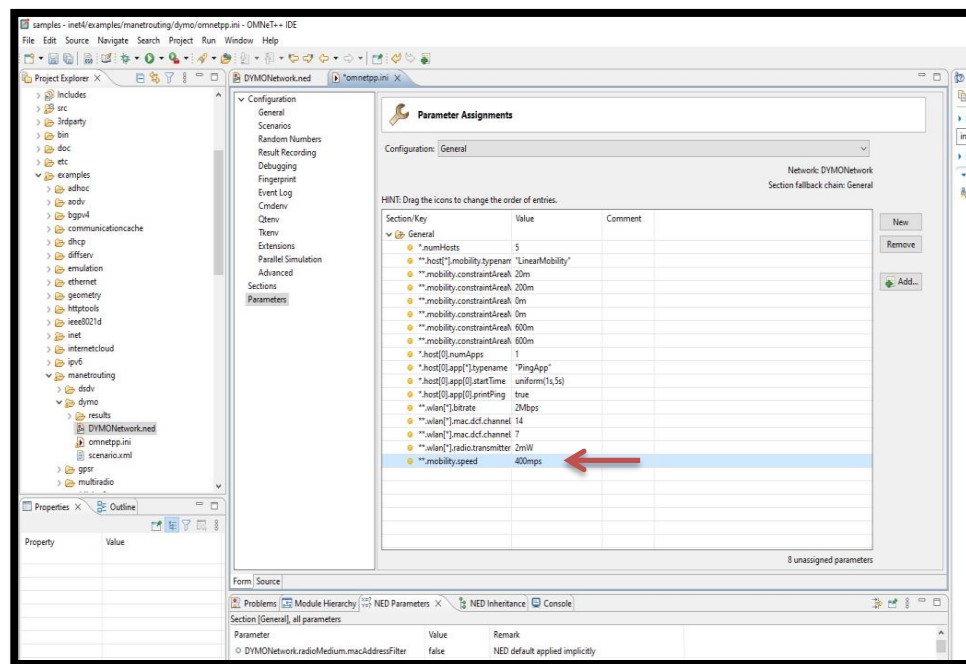


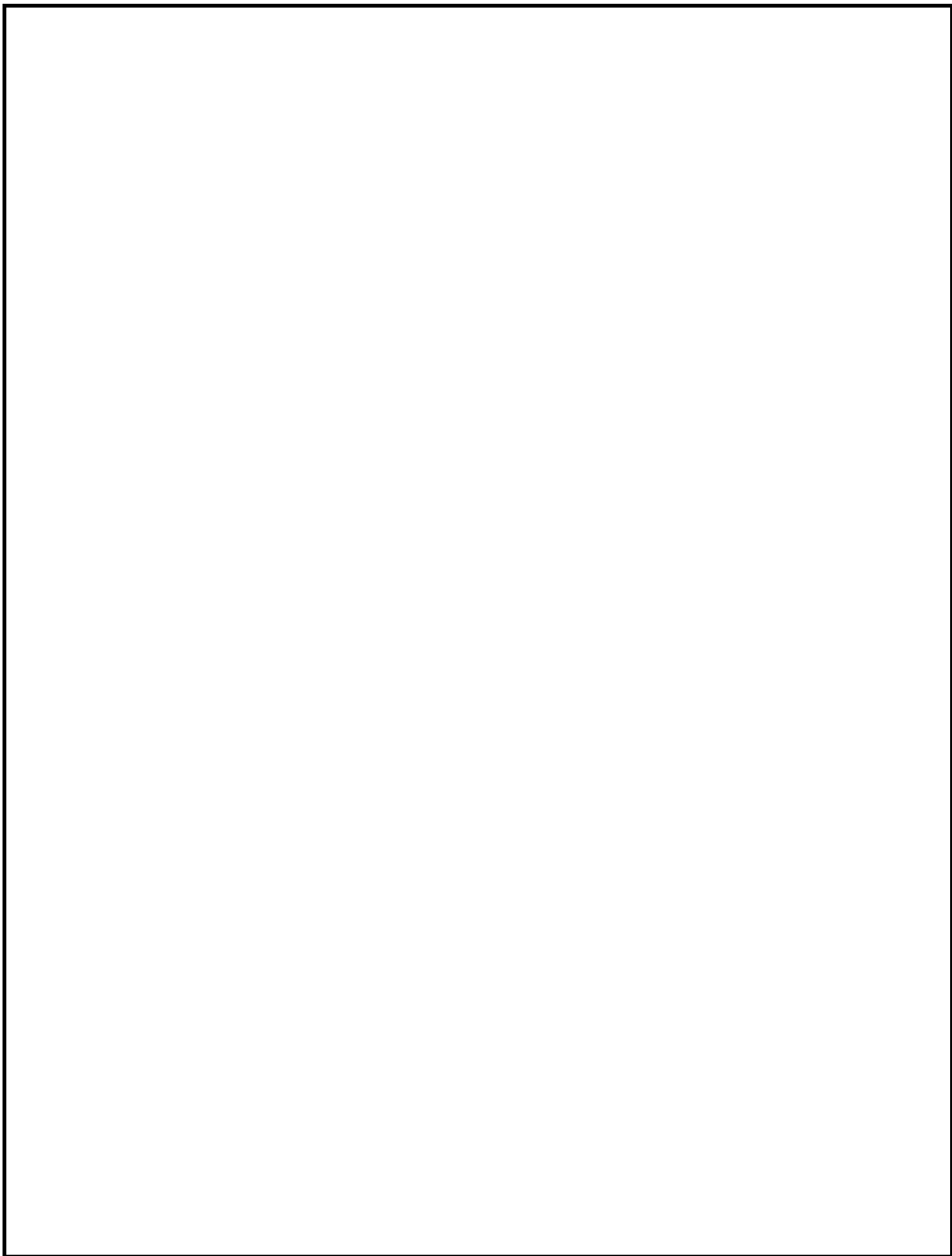


Step 5: For adding a new parameter click on add button and add the parameter `**mobility.speed`

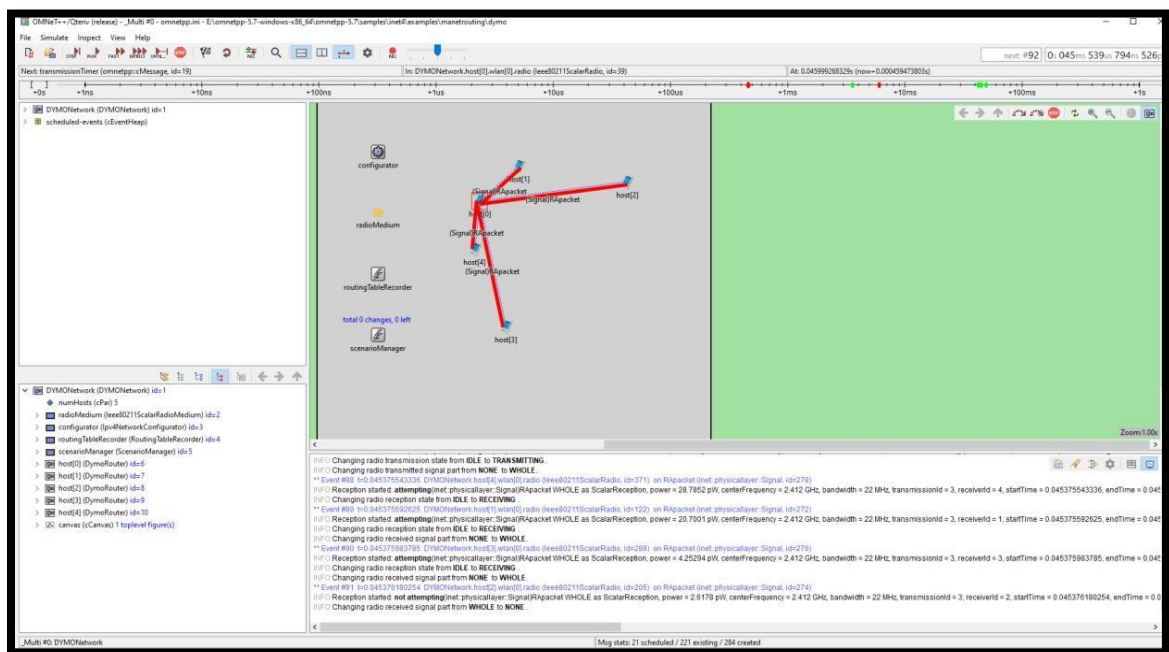


Step 6: Set the value for `**mobility.speed = 400mps`

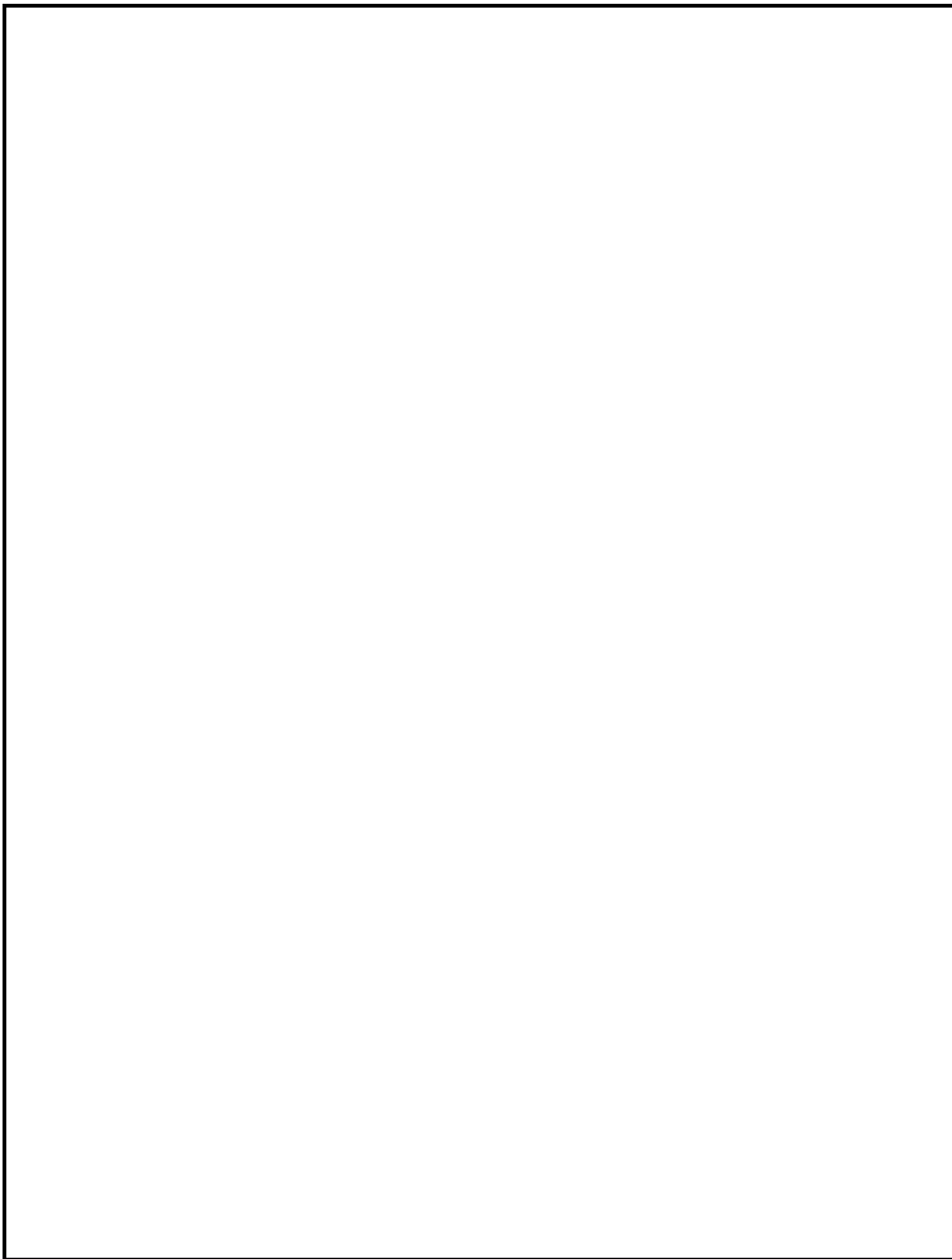




Step 7: Now we run the simulation with 5 mobile hosts forming MANET and get the following output



**CONCLUSION :-**



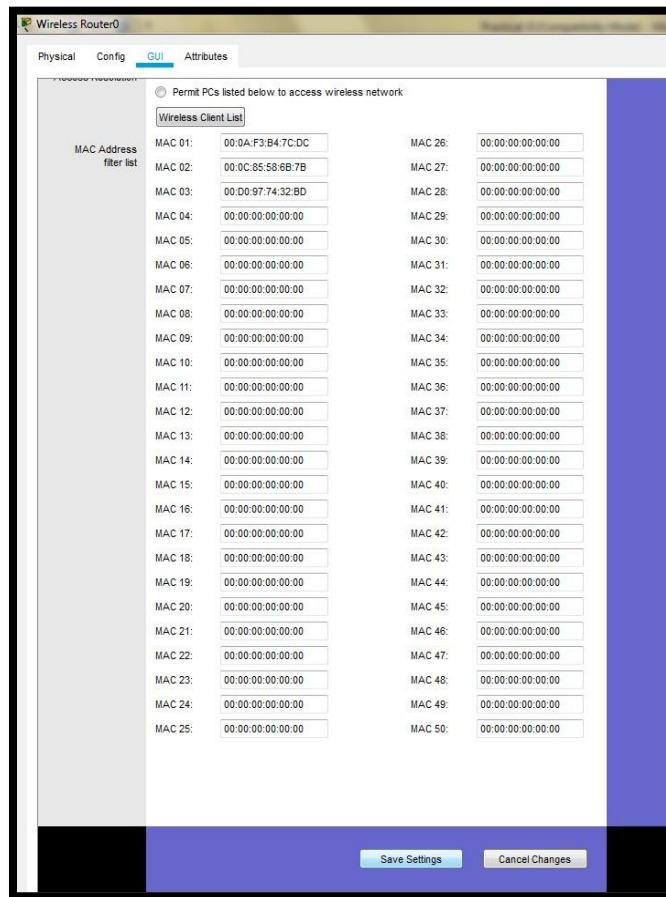


## PRACTICAL NO. 7

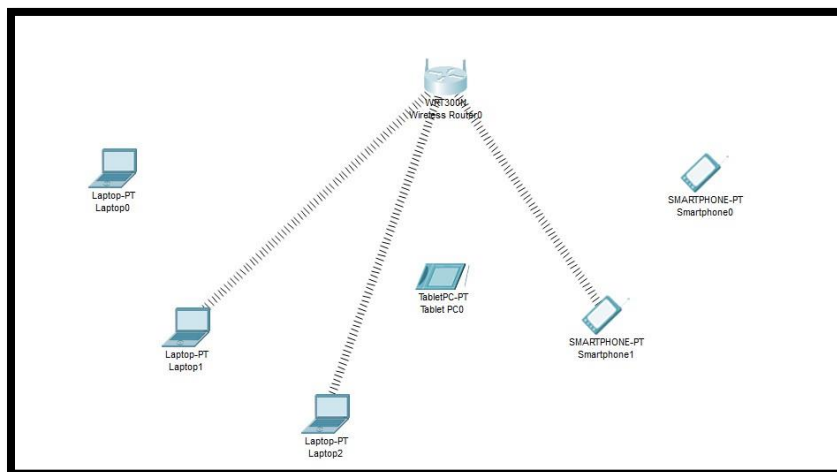
**AIM :-**

**THEORY :-**

## OUTPUT :-



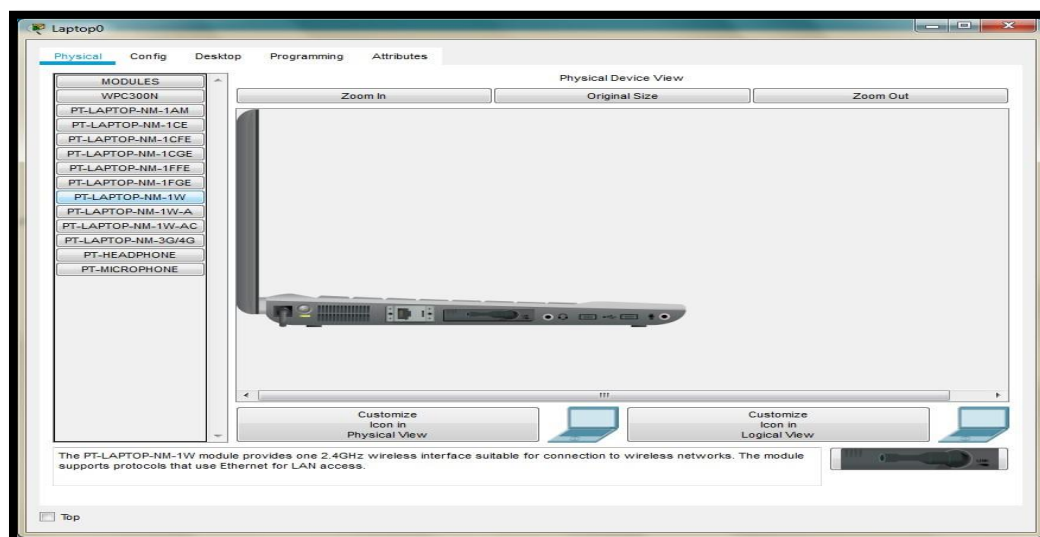
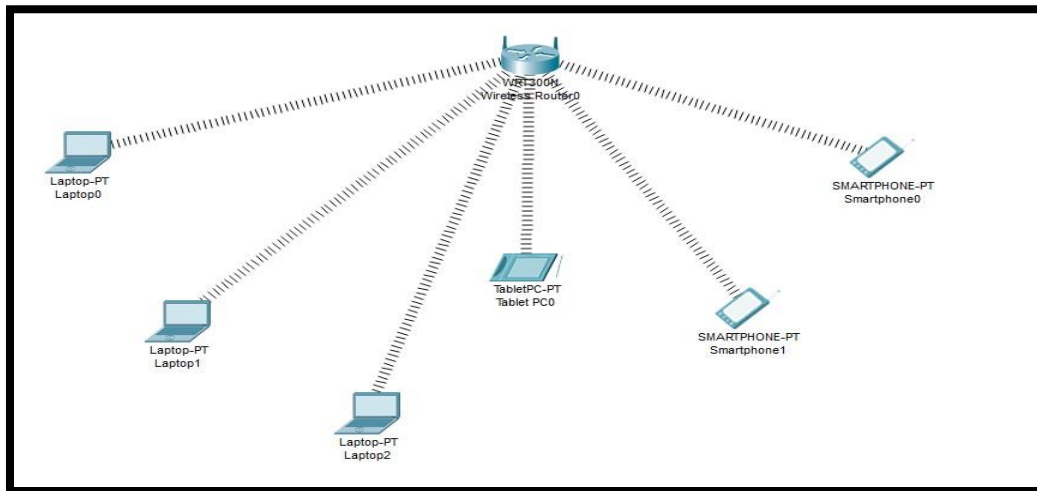
The result so obtained is as shown; the three devices denied any wireless connectivity



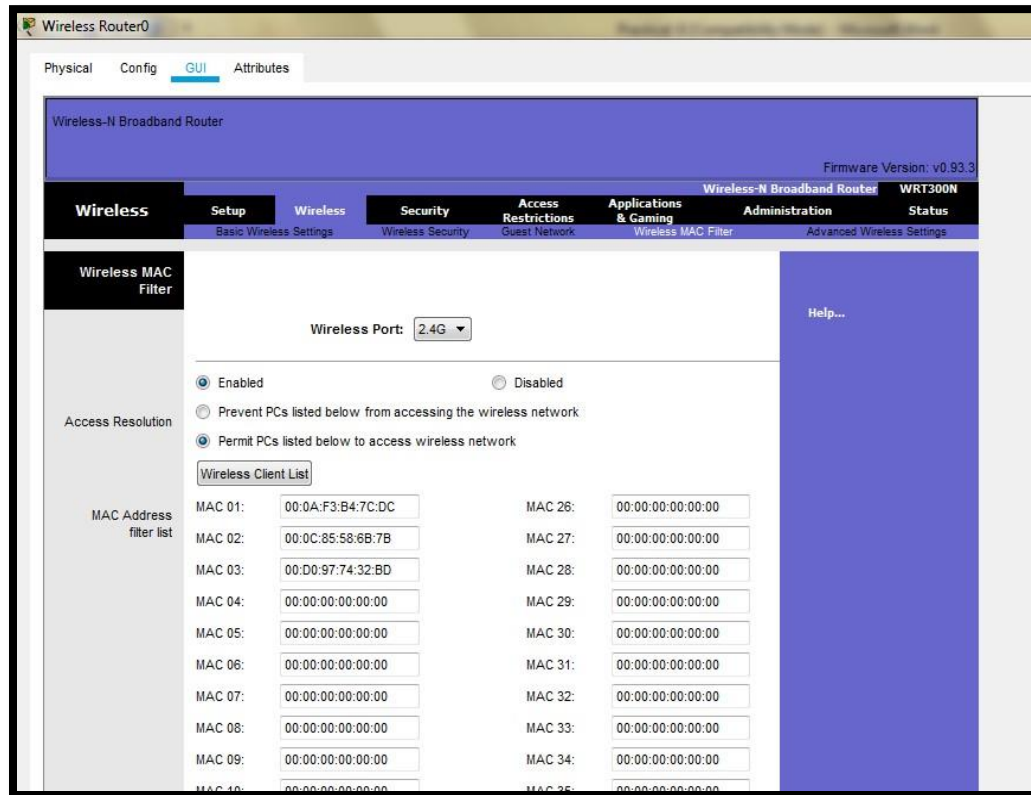
# Create MAC protocol simulation implementation for wireless sensor Network.

## STEPS :-

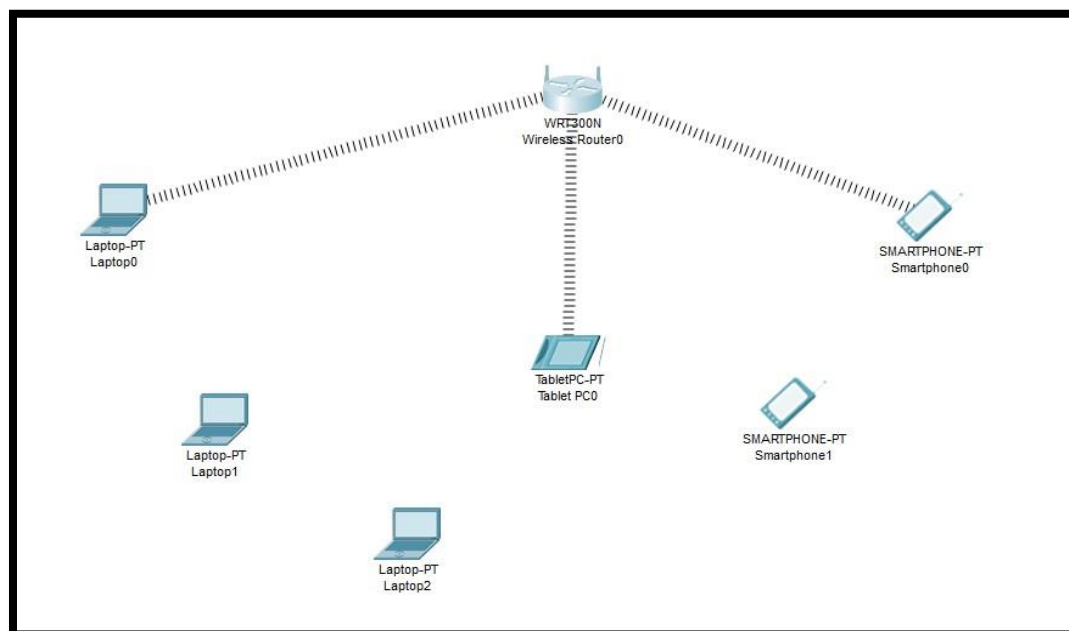
Step 1: Smart phones and Tablet have a wireless interface by default, while the laptop does not has a wireless interface, we need to add the interface in all the laptops  
Adding the wireless interface to each Laptops as follows



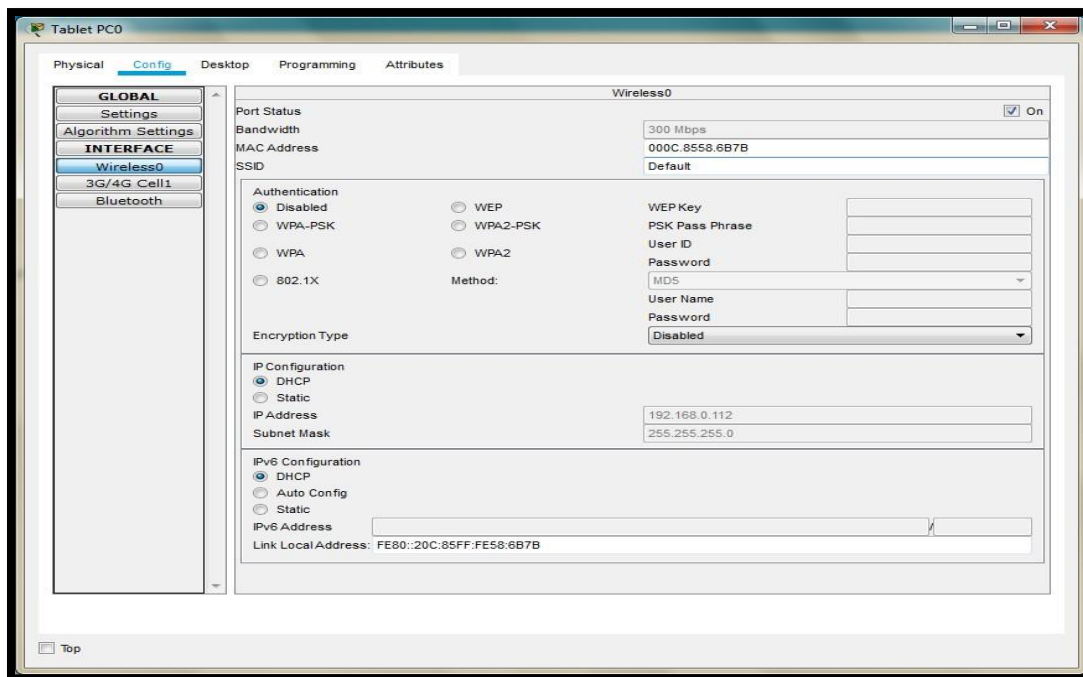
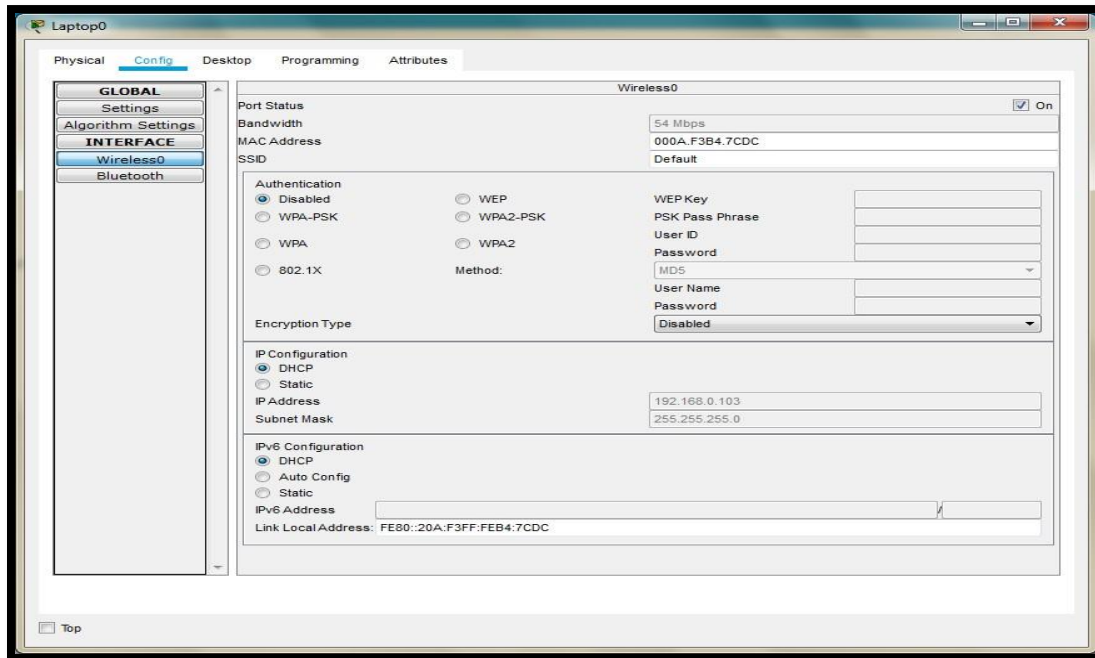
OUTPUT :-

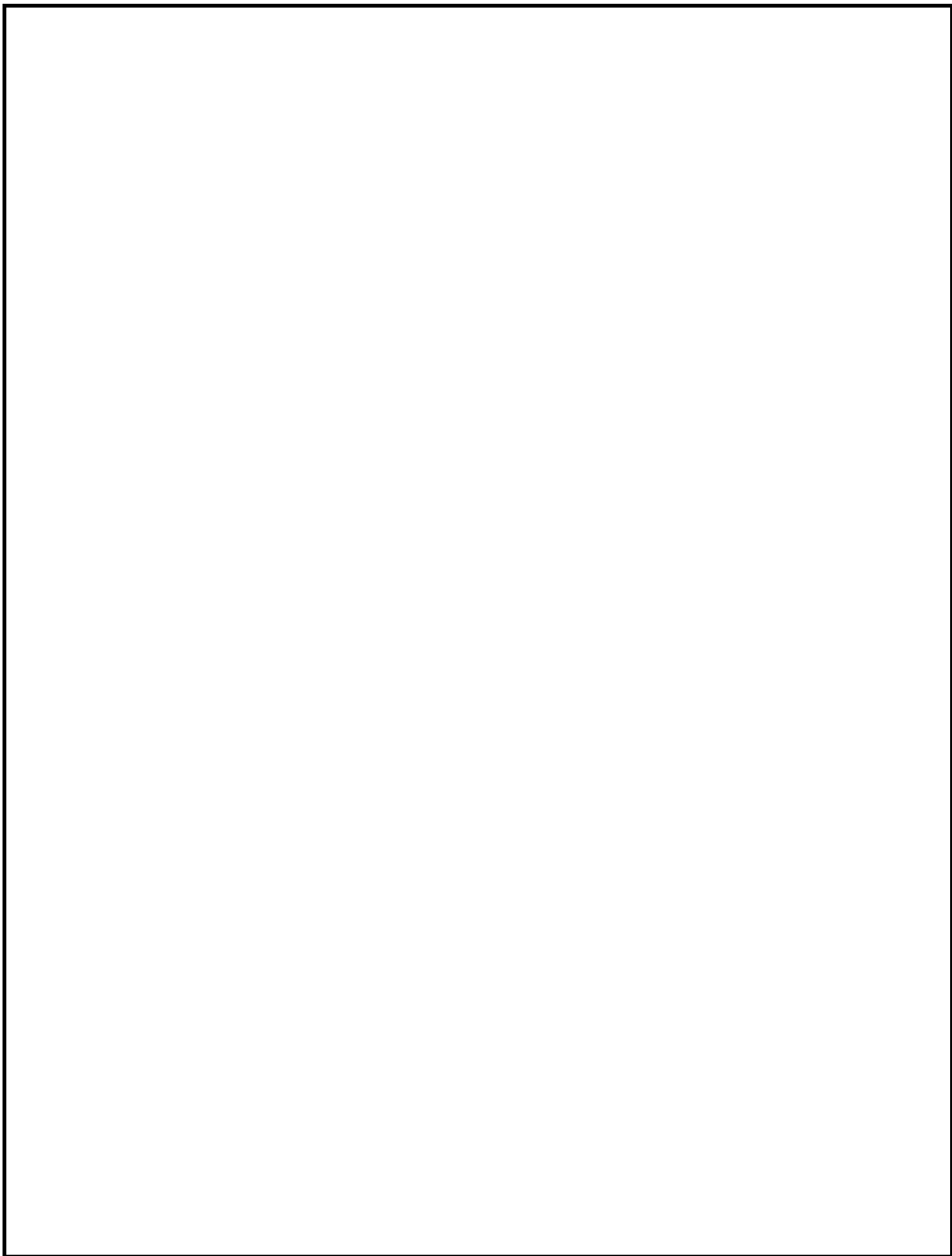


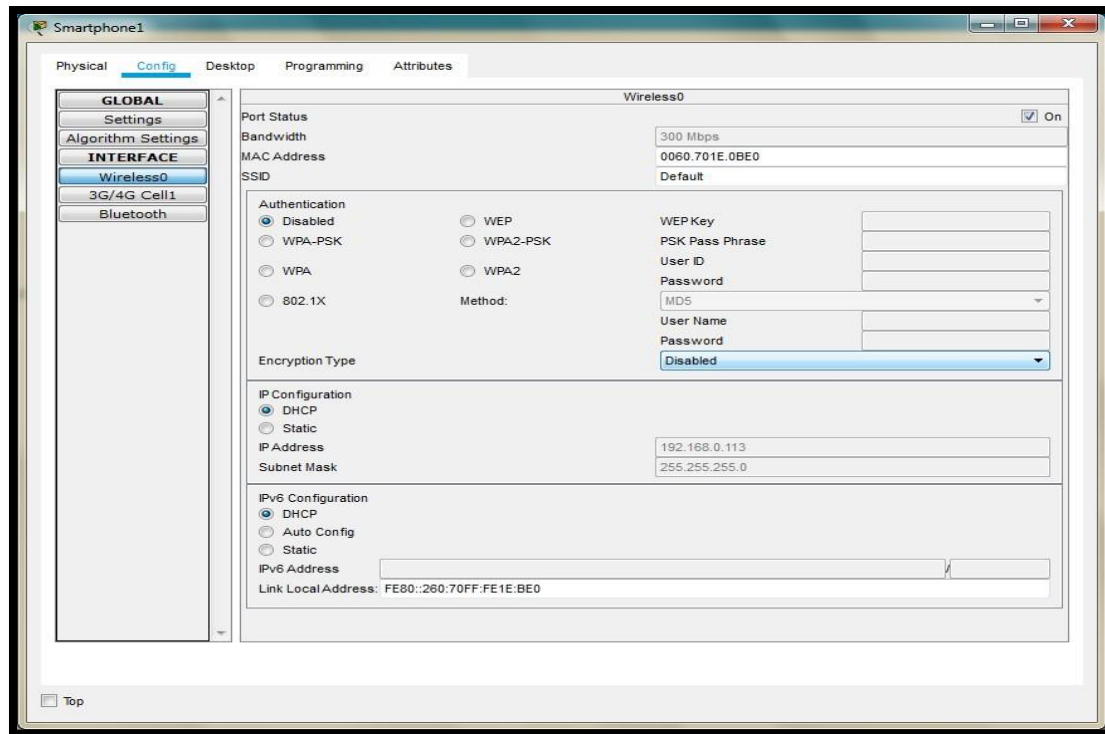
And save the setting and get the following



Copy the MAC address of each component as follows

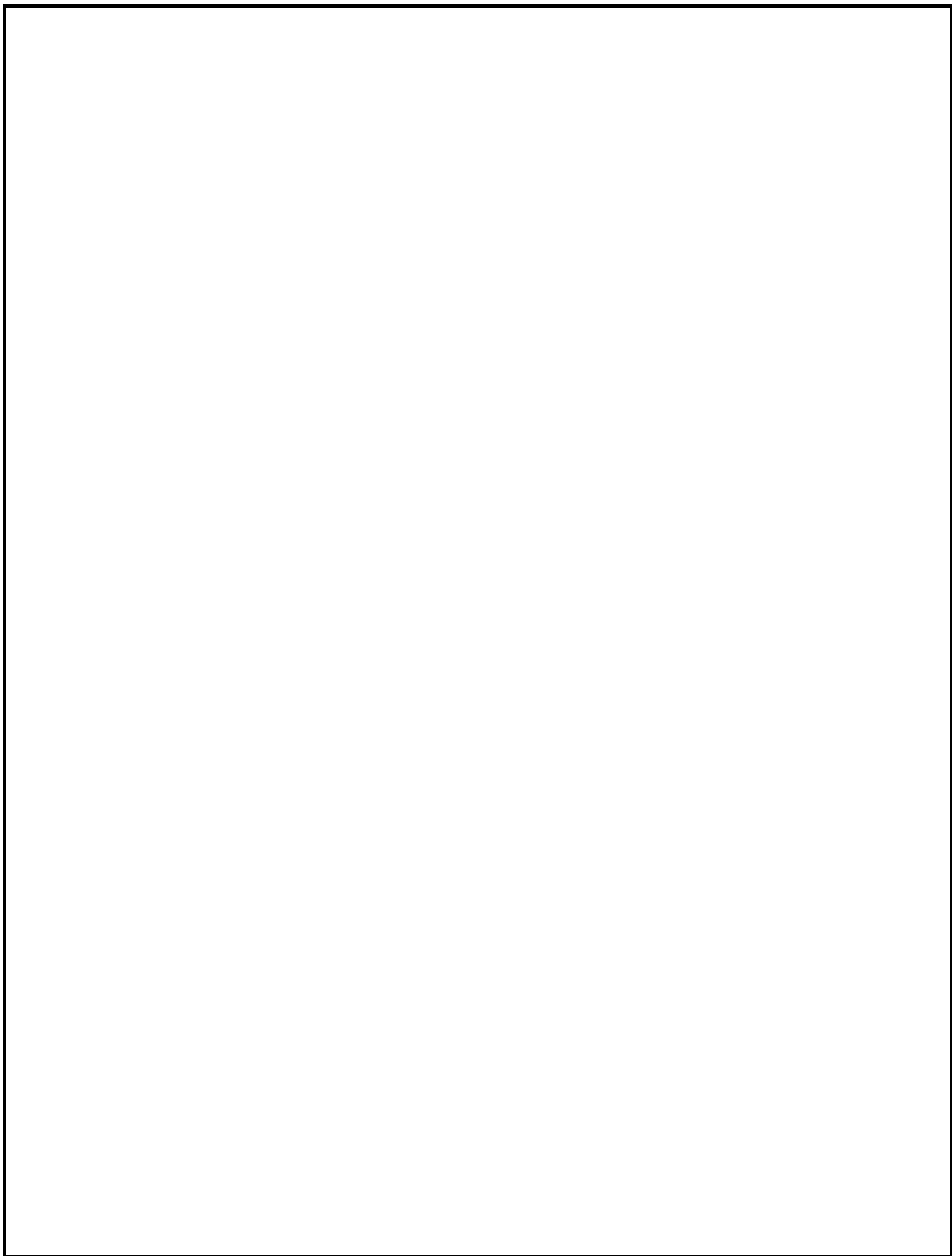






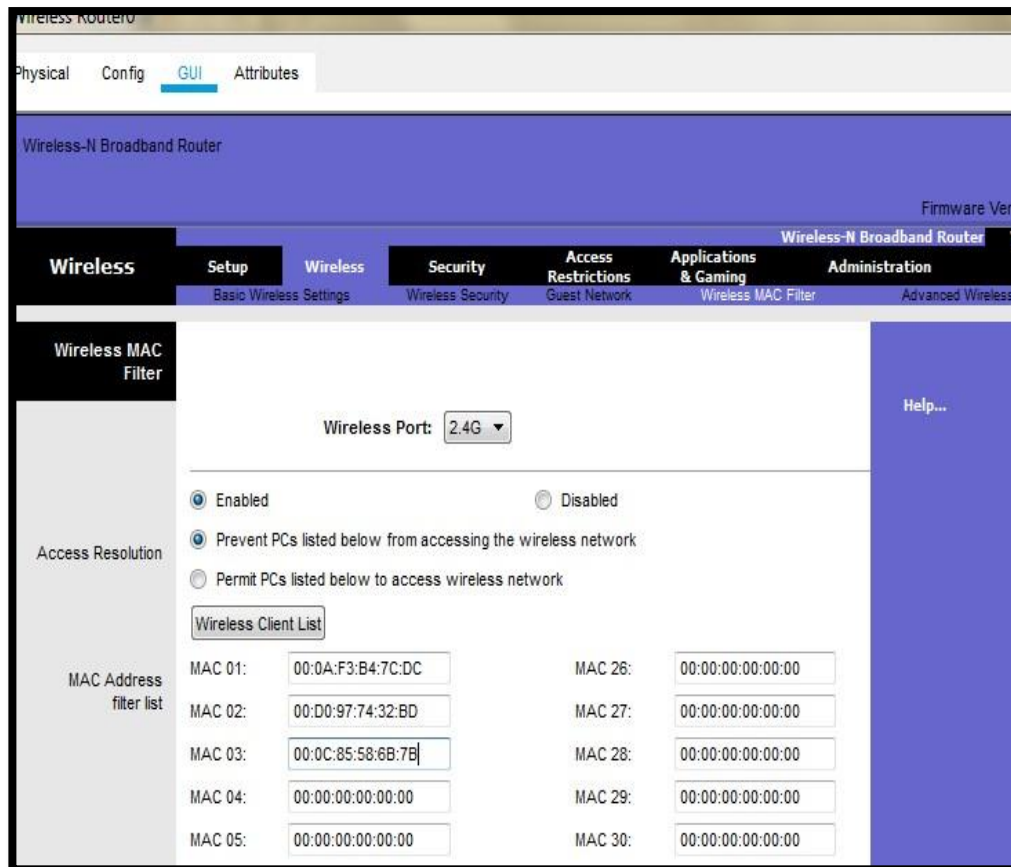
We note the following MAC addresses and convert them to the following form

Component	MAC Address	Converted MAC address
Laptop0	000A.F3B4.7CDC	00:0A:F3:B4:7C:DC
Laptop1	0001.4269.6539	00:01:42:69:65:39
Laptop2	0060.5CB8.B919	00:60:5C:B8:B9:19
TabletPC	000C.8558.6B7B	00:0C:85:58:6B:7B
SmartPhone0	00D0.9774.32BD	00:D0:97:74:32:BD
SmartPhone1	0060.701E.0BE0	00:60:70:1E:0B:E0



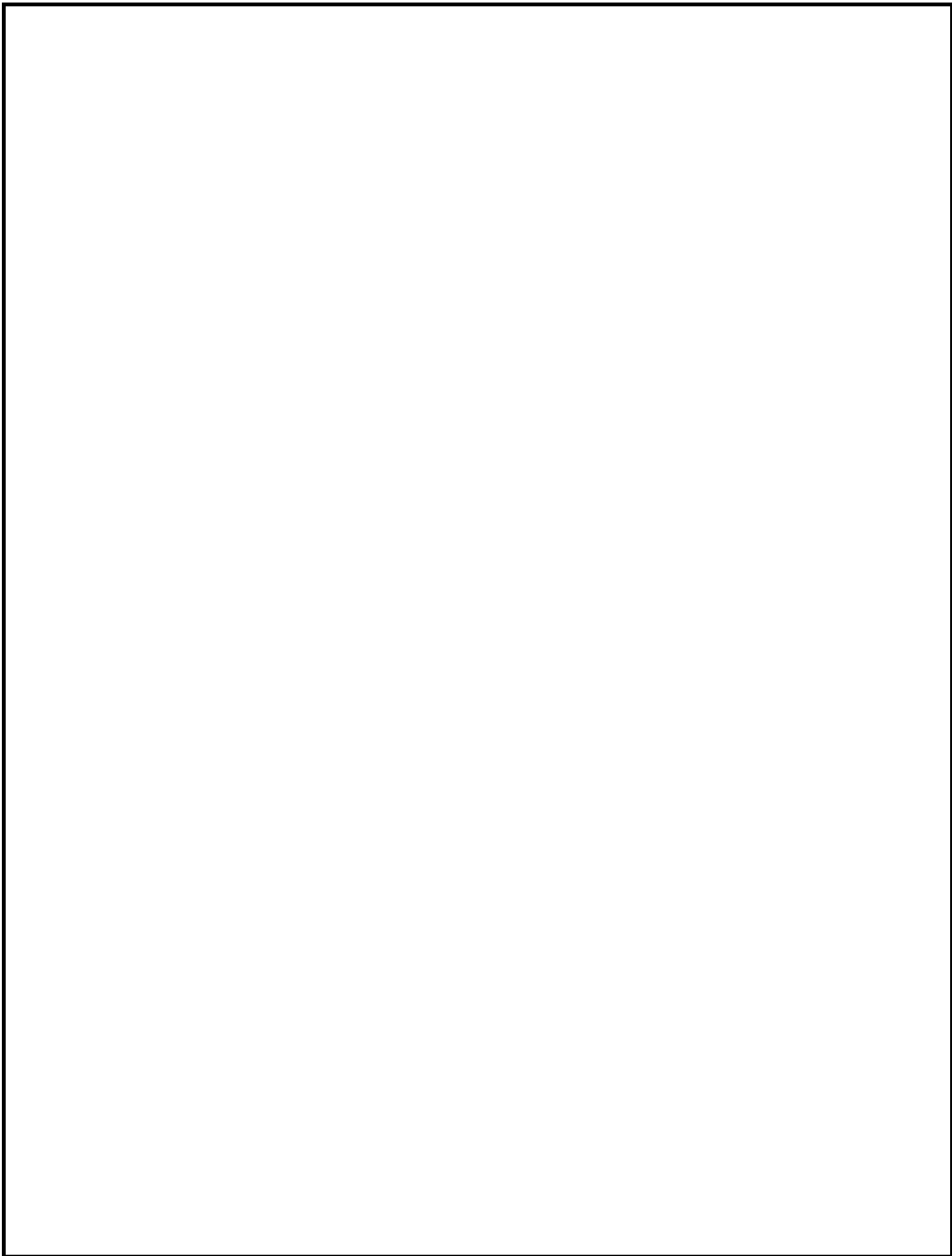


Now we add few addresses in the wireless MAC filter of the Wireless Router and then use the given options for either allow or deny the Wireless access



As seen in above screen shot we add the MAC address of Laptop0, TabletPC, Smartphone0 in the list so as to deny them accessing the Wireless network and then save the settings. Similarly we can change the setting so that the above devices get wireless connectivity and the remaining devices do not get the wireless connectivity.

**CONCLUSION :-**

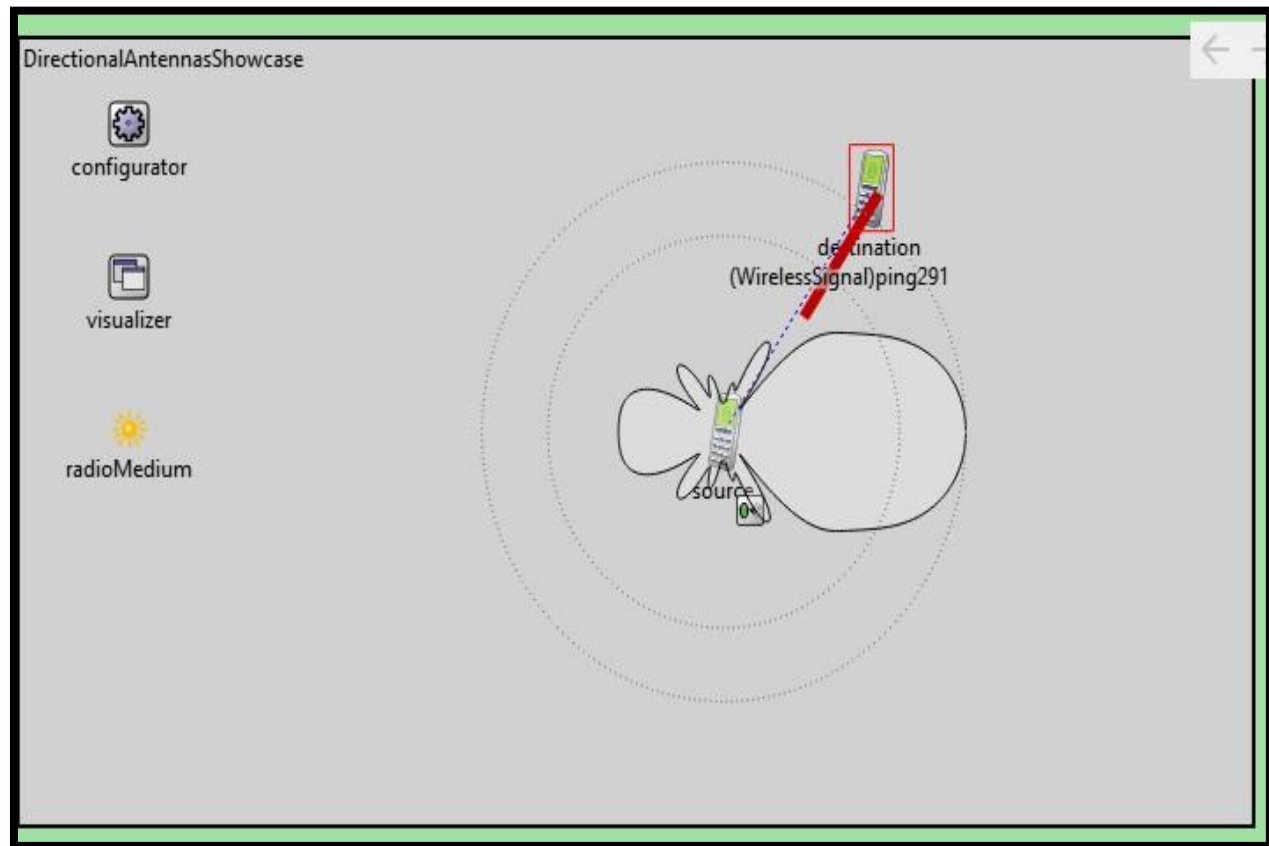


## PRACTICAL NO. 8

**AIM :-**

**THEORY :-**

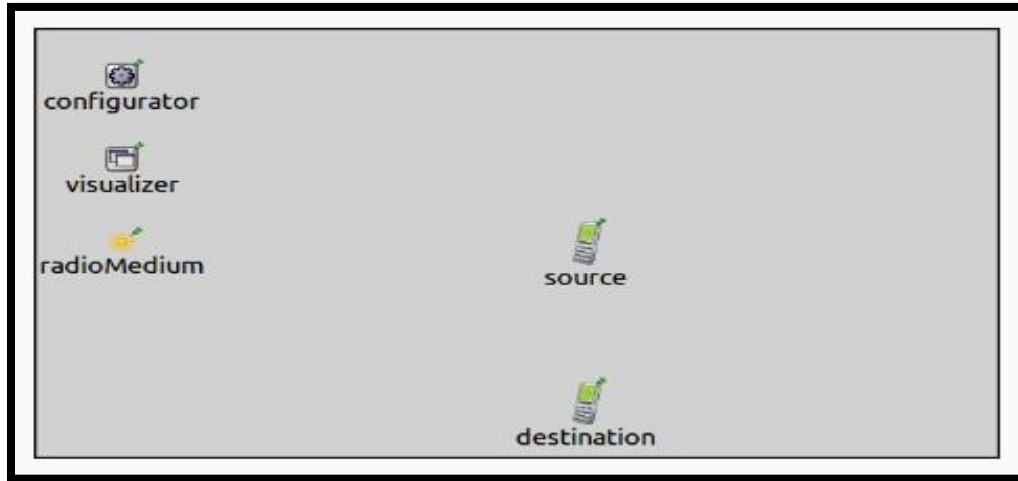
## OUTPUT :-



# Simulate Mobile Adhoc Network with Directional Antenna

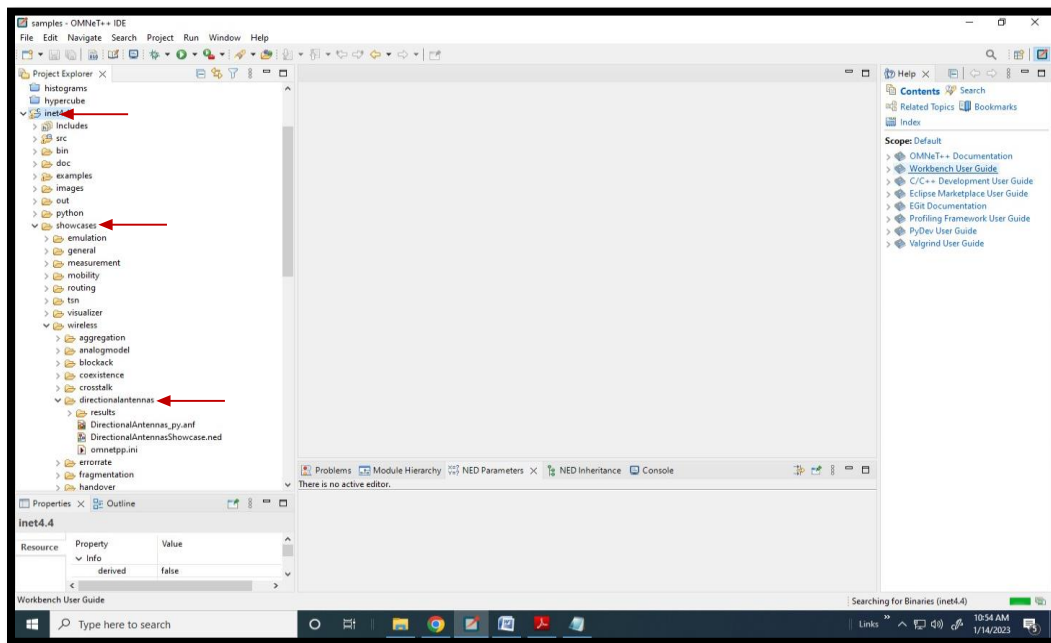
## STEPS :-

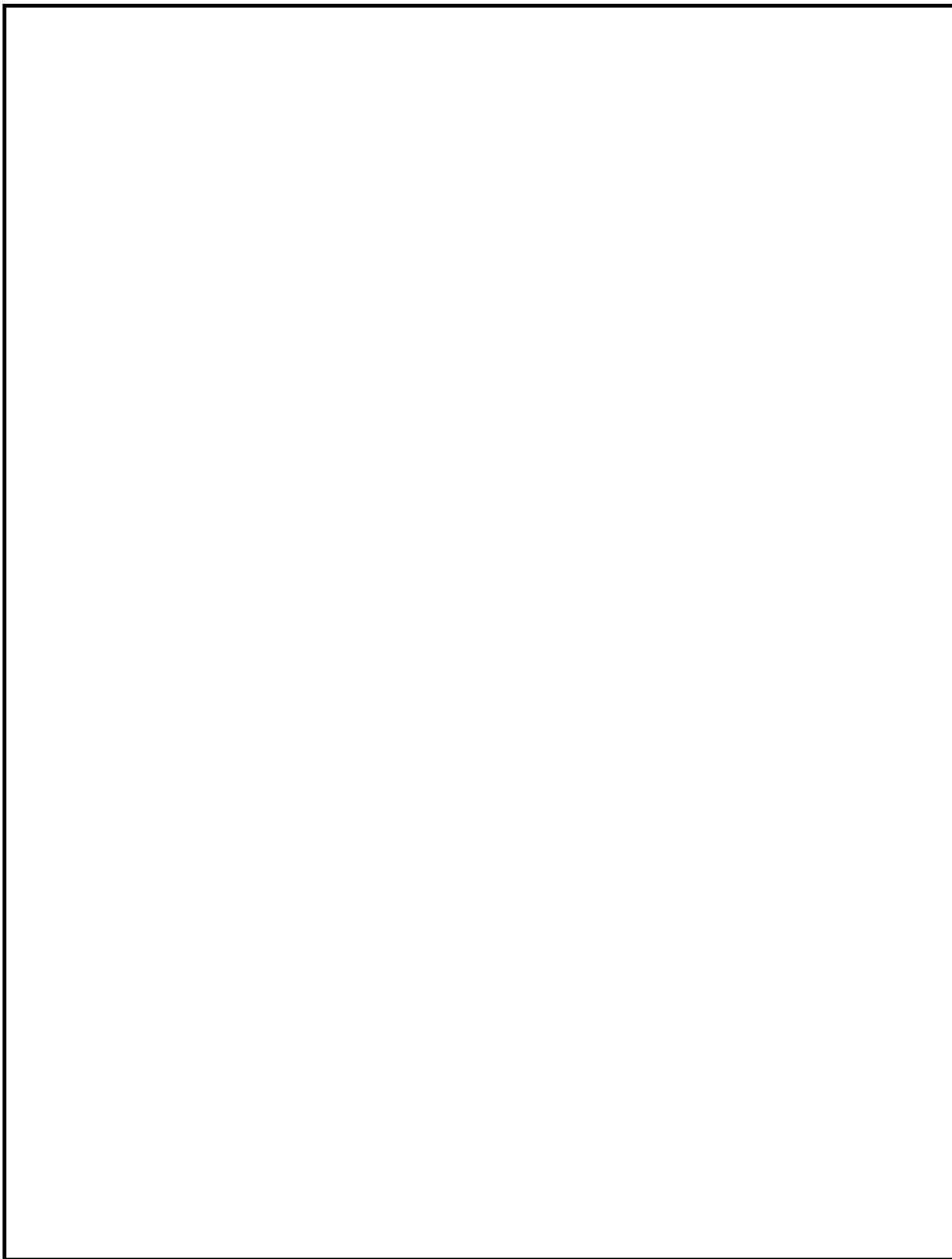
We use the following network



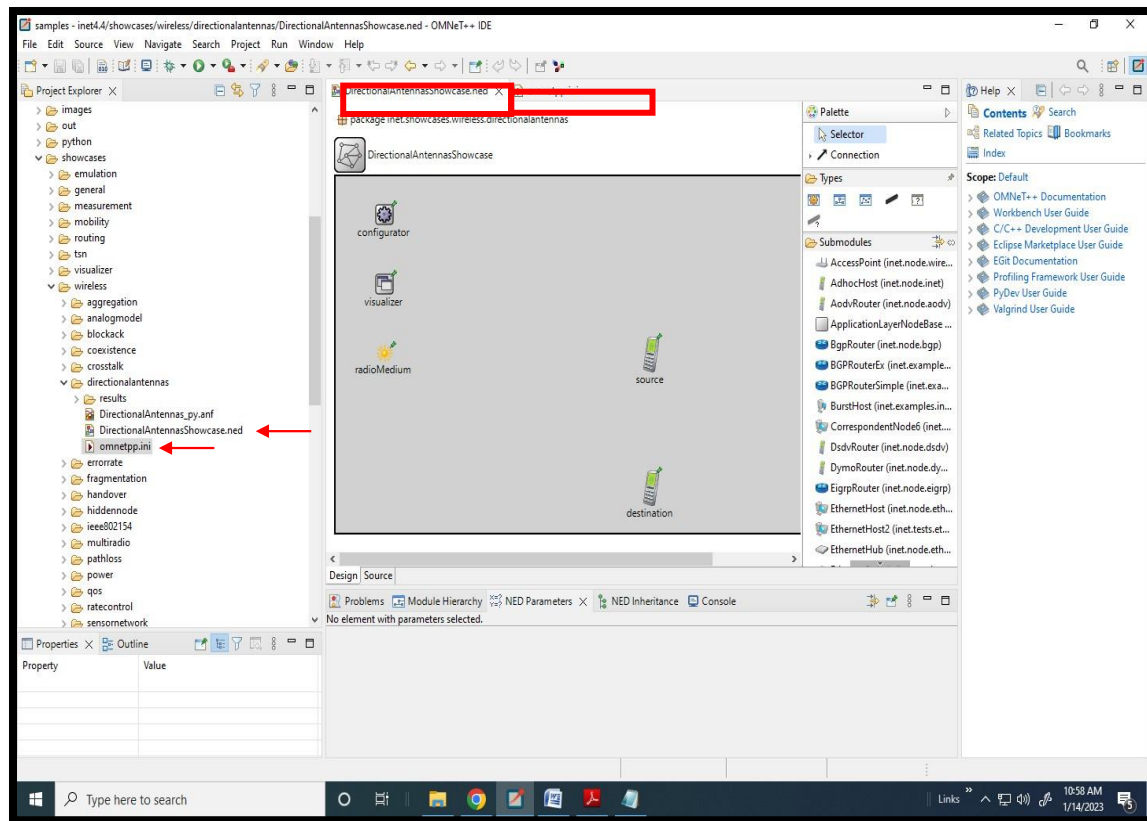
This simulation can be run by using the following steps

Step 1 : Start the Omnetpp IDE: (Open INET/showcases/directionalantenna)

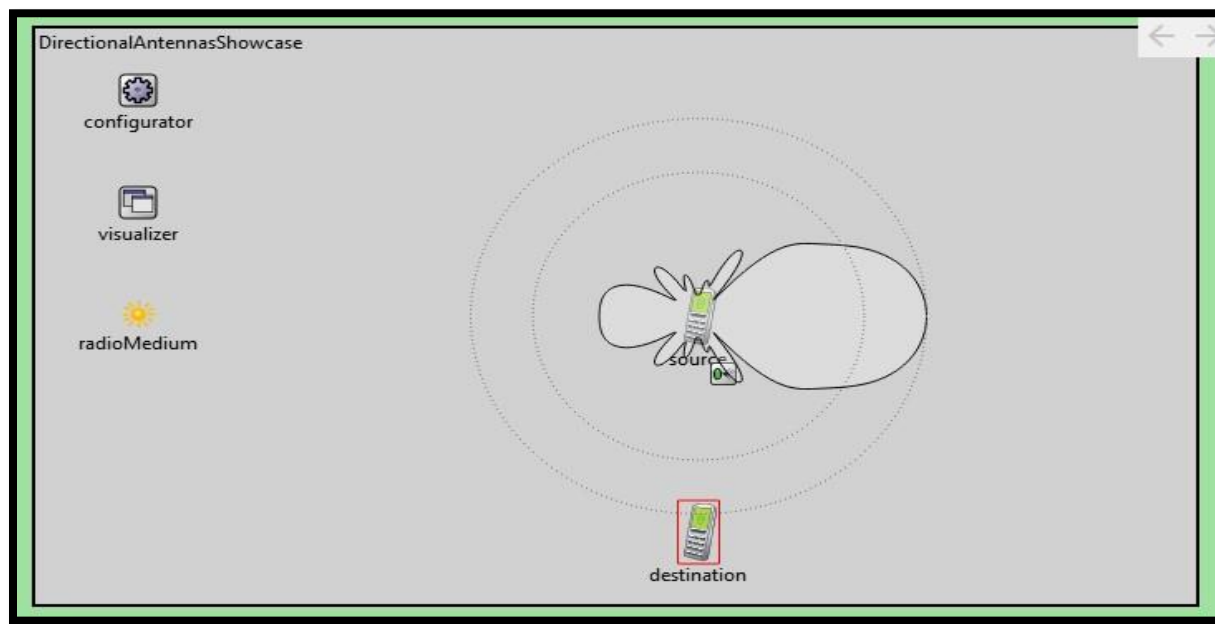


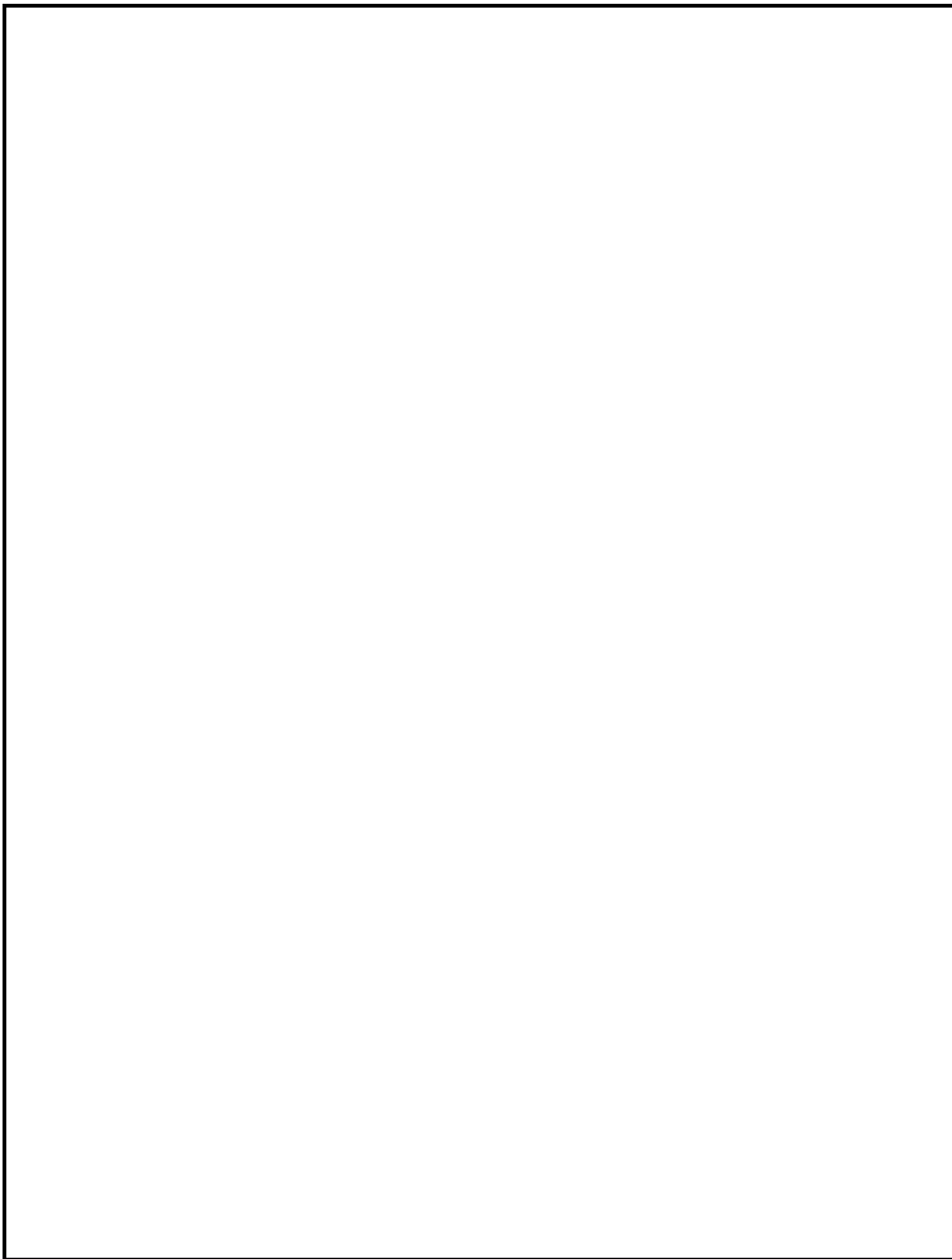


Step 2 : Load the files DirectionalAntennaShowcases.ned and omnett.ini



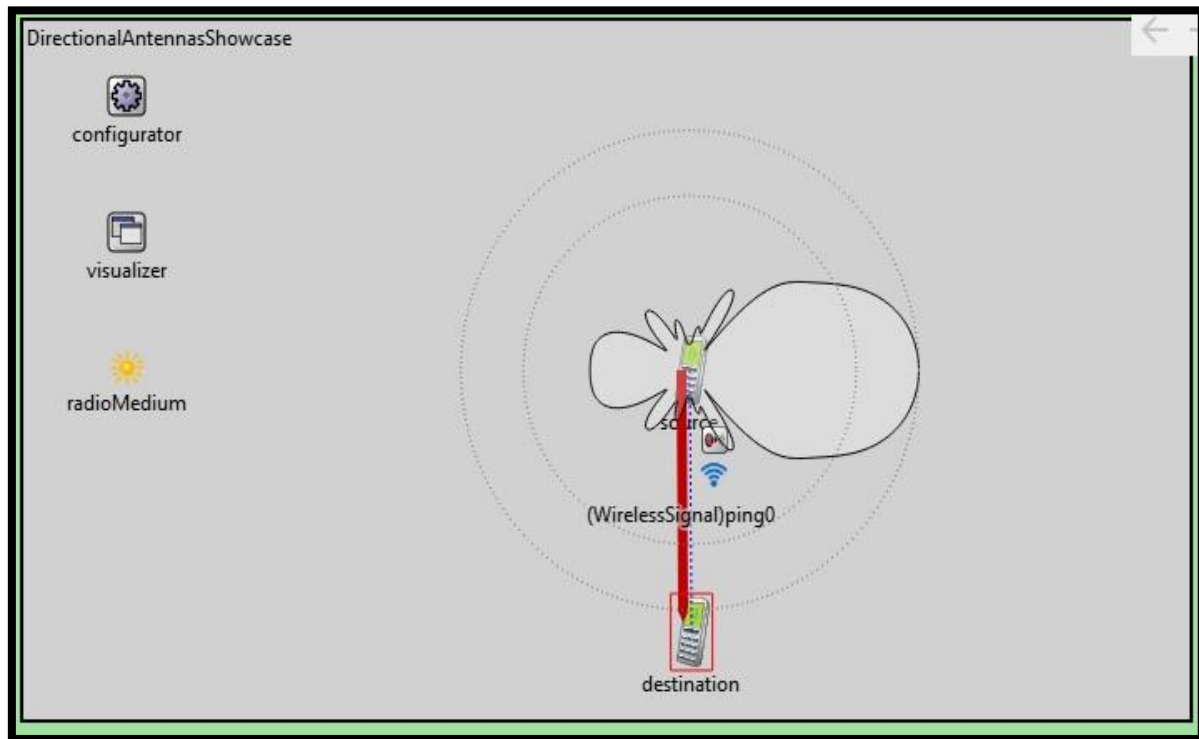
Step 3 : Start the simulation:



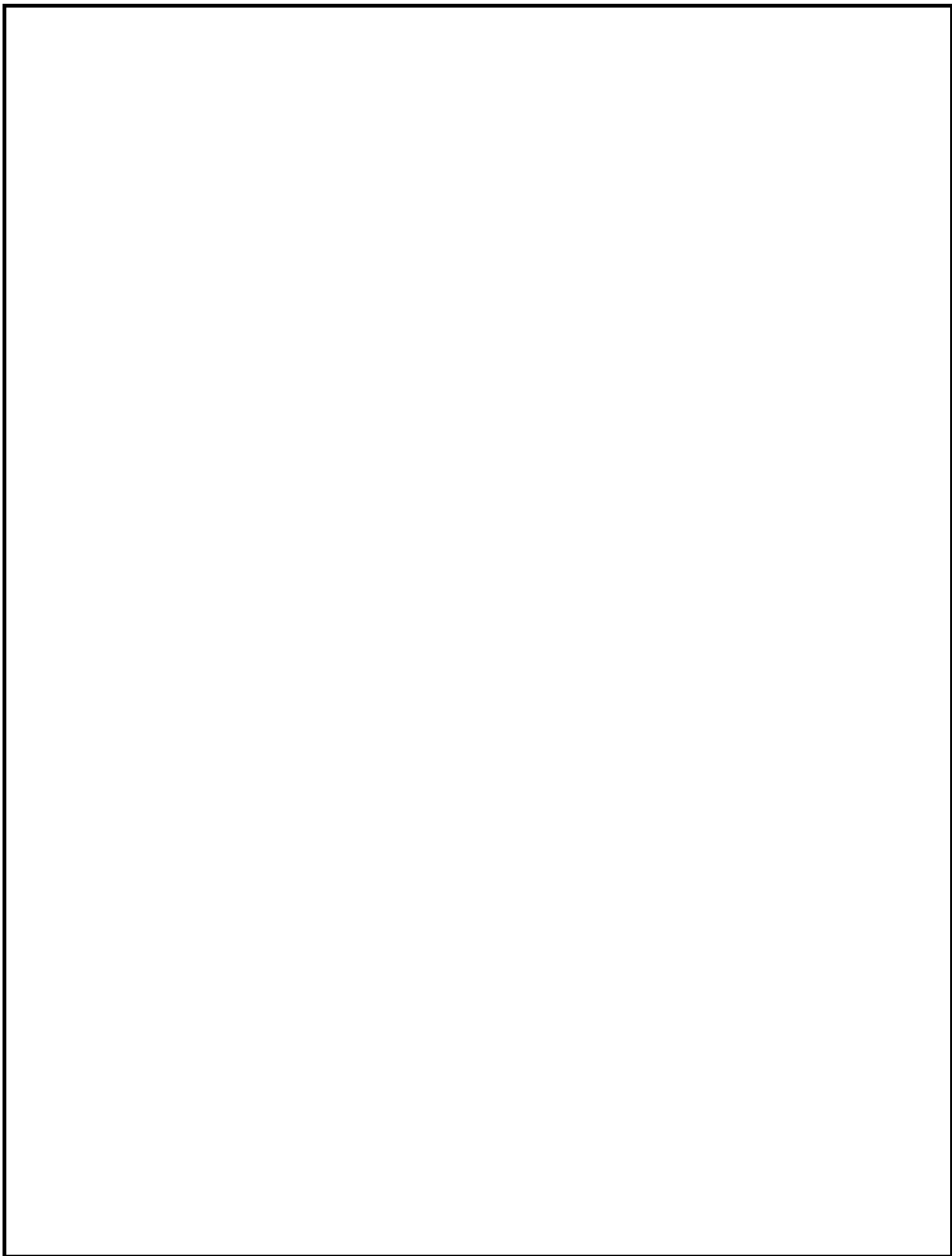




Step 4 : Run the Simulation:



**CONCLUSION :-**



## PRACTICAL NO. 9

**AIM :-**

**THEORY :-**

## OUTPUT :-

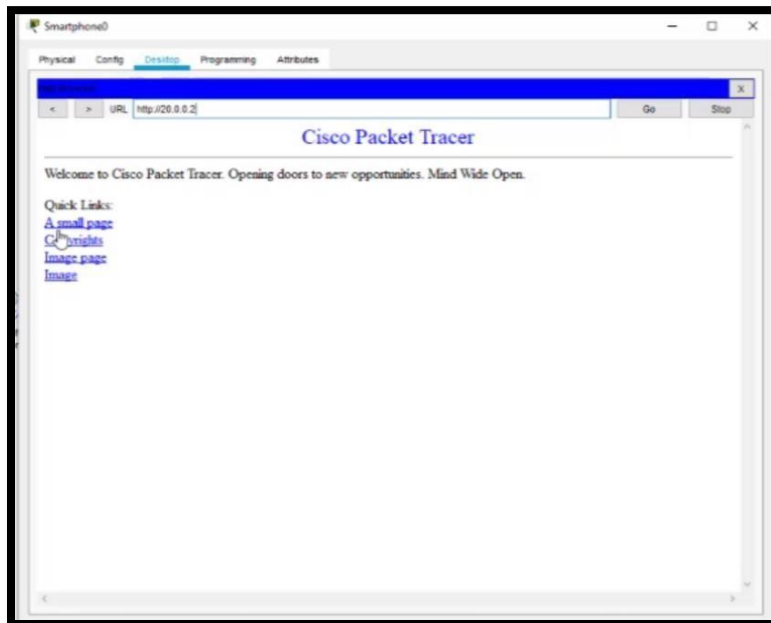
- 1) Send a ping message from smartphone to server

```
Packet Tracer PC Command Line 1.0
C:\>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Reply from 20.0.0.1: bytes=32 time=14ms TTL=255
Reply from 20.0.0.1: bytes=32 time=22ms TTL=255
Reply from 20.0.0.1: bytes=32 time=20ms TTL=255
```

- 2) Access the web service from the server through the Smartphone

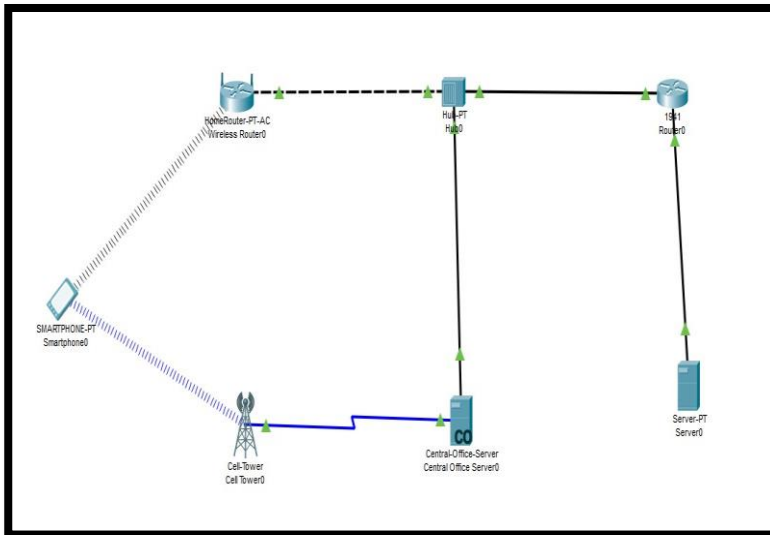


Hence the mobile network was created and connectivity was also verified

# Create a mobile network using Cell Tower, Central Office Server, Web browser and Web Server. Simulate connection between them.

## STEPS :-

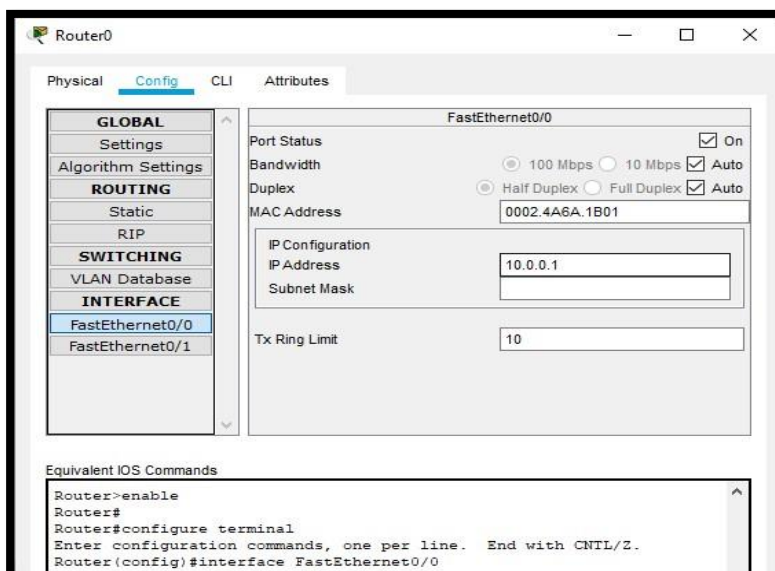
Step 1 : Consider the following topology

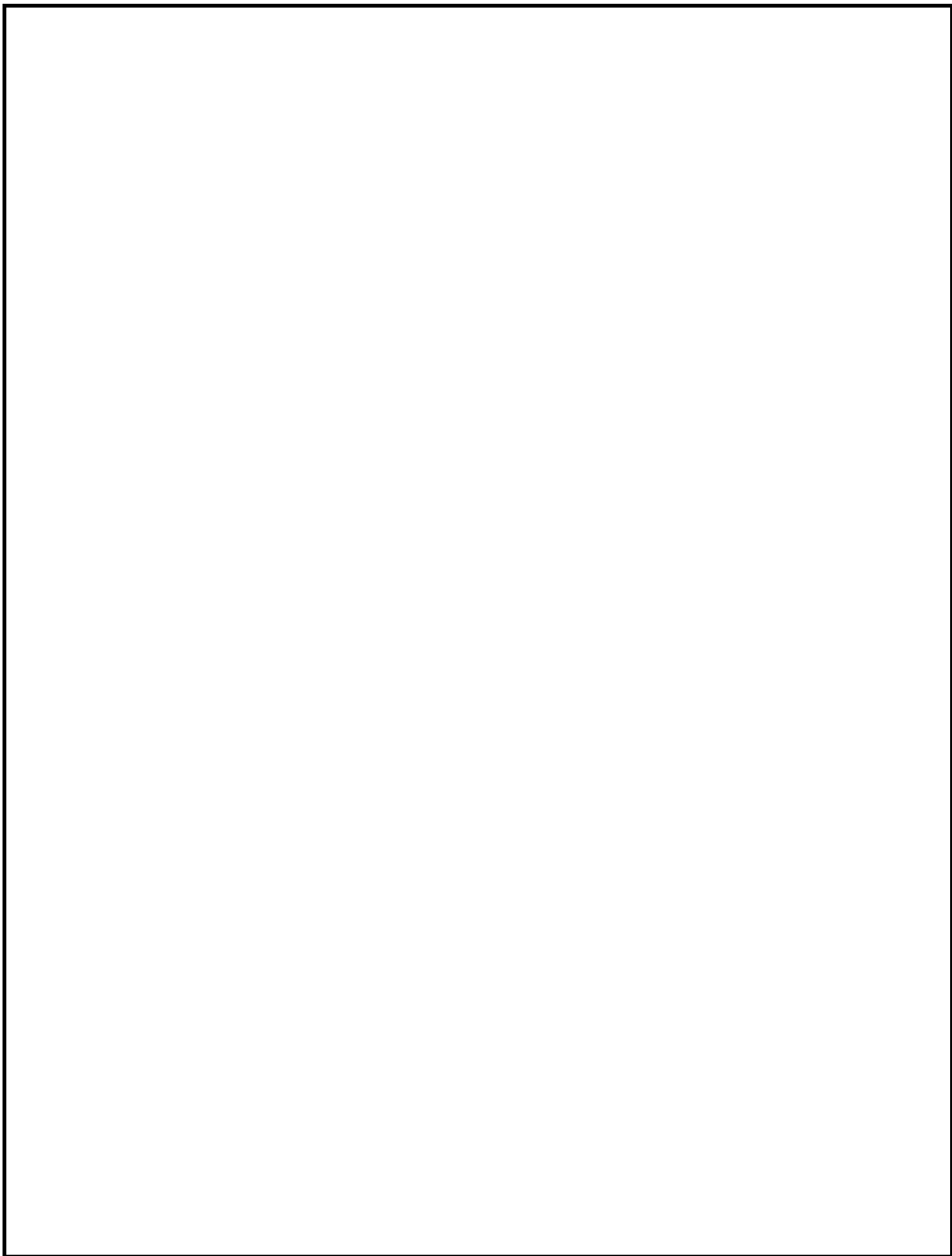


We create the above topology using the Cisco packet tracer

IP address configuration is done for the following devices

- 1) Router 0:
  - i) Interface: FastEthernet 0/0:





ii) Interface: FastEthernet0/1:

The screenshot shows the configuration window for the FastEthernet0/1 interface on Router0. The left sidebar contains a tree view with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (FastEthernet0/0, FastEthernet0/1). The main panel is titled 'FastEthernet0/1' and includes the following settings:

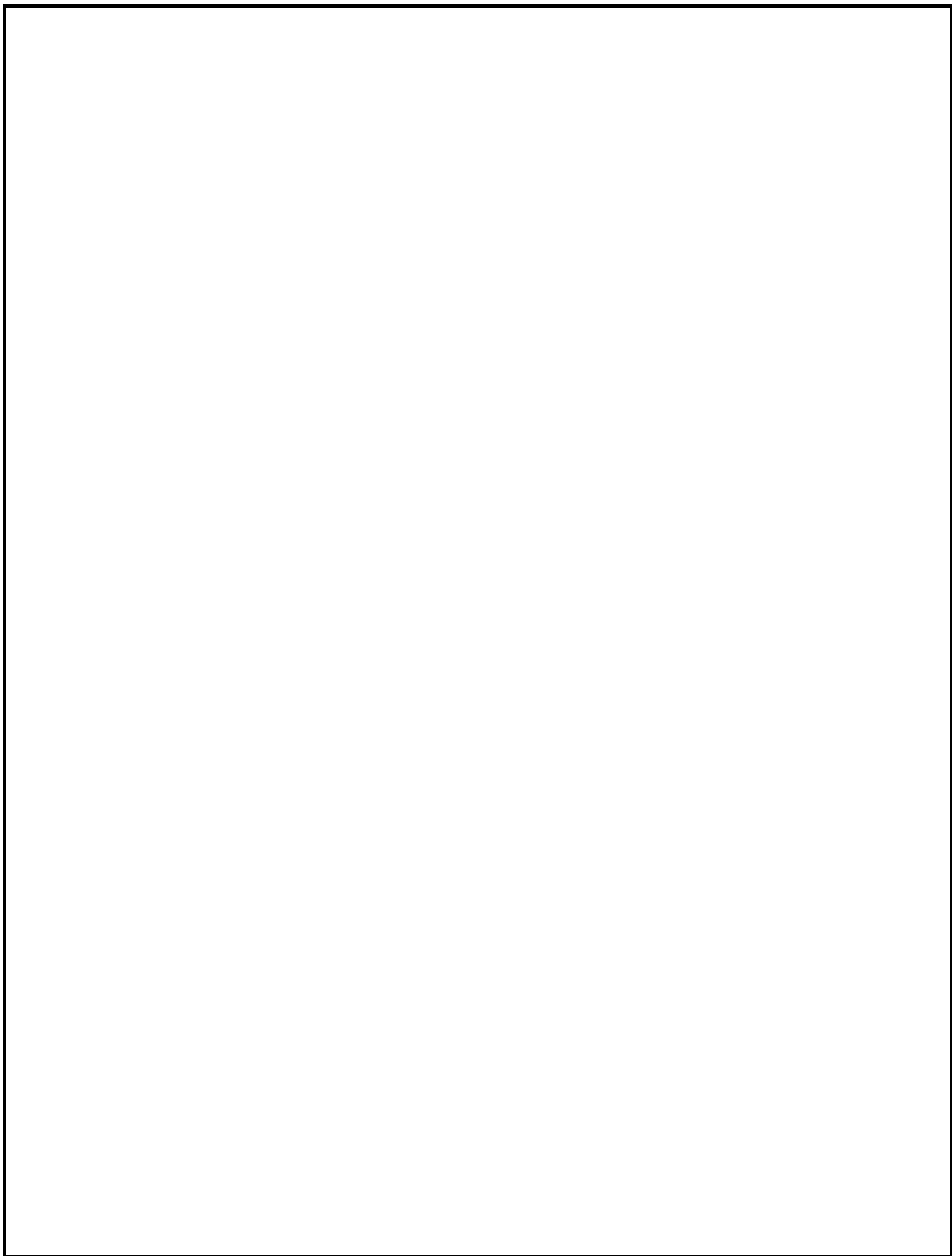
- Port Status: ☒ On
- Bandwidth: ☒ 100 Mbps, ☐ 10 Mbps, ☒ Auto
- Duplex: ☒ Half Duplex, ☐ Full Duplex, ☒ Auto
- MAC Address: 0002.4A6A.1B02
- IP Configuration:
  - IP Address: 20.0.0.1
  - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

At the bottom, the 'Equivalent IOS Commands' section shows the command: `Router(config-if)#ip address 10.0.0.1 255.0.0.0`

2) Wireless Router:

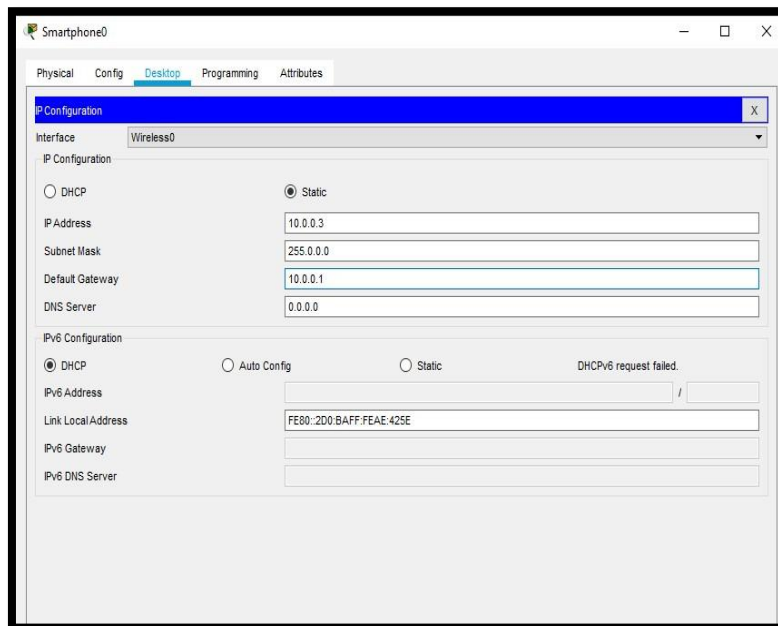
The screenshot shows the configuration window for the Internet Settings on the Wireless Router0. The left sidebar contains a tree view with categories: GLOBAL (Settings, Algorithm Settings), INTERFACE (Internet, LAN), and WIRELESS (Wireless 2.4G, Wireless 5G(1), Wireless 5G(2), Wireless Guest 2.4G, Wireless Guest 5G(1), Wireless Guest 5G(2)). The main panel is titled 'Internet Settings' and includes the following settings:

- IP Configuration:
  - ☒ Static
  - ☐ DHCP
  - ☐ Media Bridge
  - ☐ Wireless AP
- Username: (empty field)
- Password: (empty field)
- IP Address: 10.0.0.2
- Subnet Mask: 255.0.0.0
- Default Gateway: 10.0.0.1
- DNS Server: (empty field)

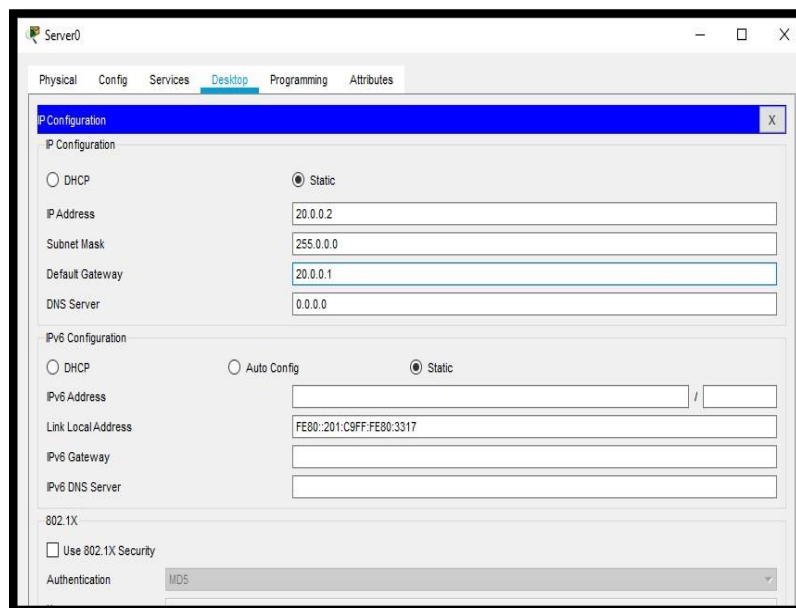




### 3) Smartphone:



### 4) Server:



**CONCLUSION :-**