Computer Networks (CS303)

Assignment - 10

U19CS012

Problem Statement:

(a) Create Manual to create Network Topology.

(b) Minimum **3 Networks** should be connected to **One Router** and **DHCP Server** should be responsible for assigning IP address to all the systems in topology.

(c) Perform one transmission between two systems belonging to different networks

Step 1 : LAYOUT

Create a network shown below using:

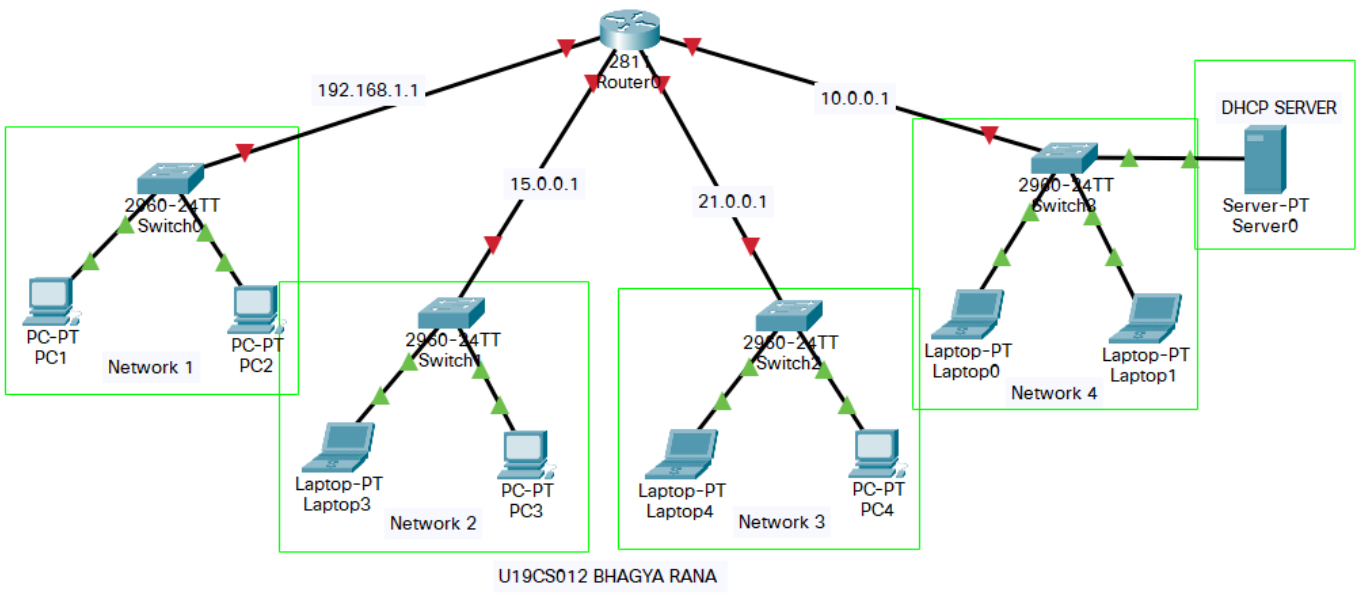
(1) 1 Router

(2) 4 Switches

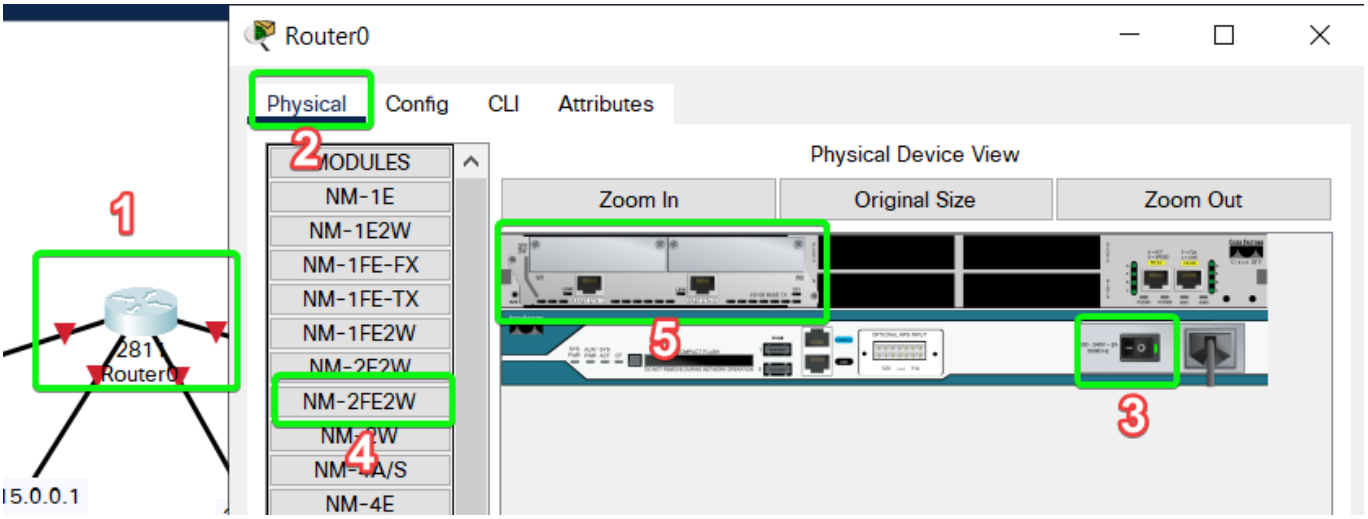
(3) 4 PC's

(4) 4 Laptop's

(5) 1 DHCP Server



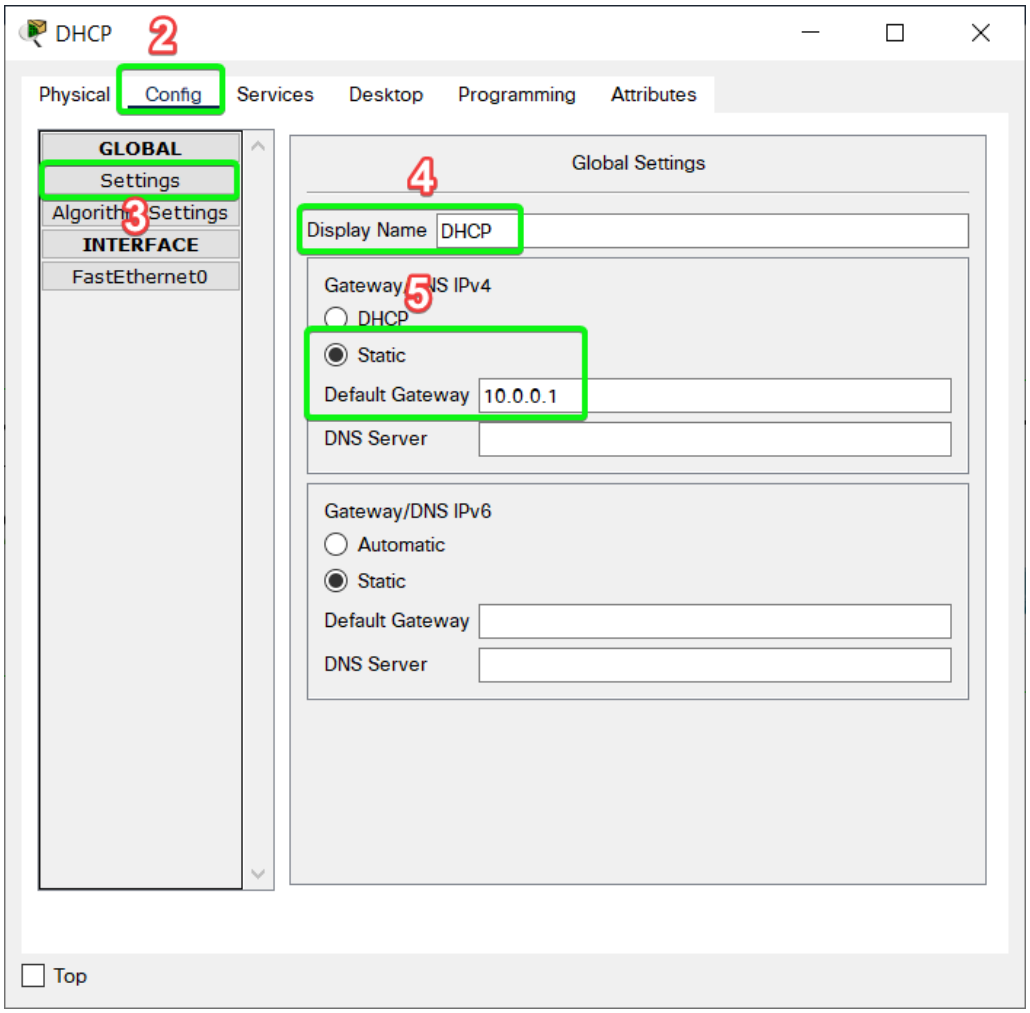
In order to connect more than 2 Networks with Route, We need to Add Modules to it. Here, I am using Router 2811, therefore go to the **Physical Configuration** and add module "**NM-2FE2W**" which enables two more Fast-Ethernet Ports.



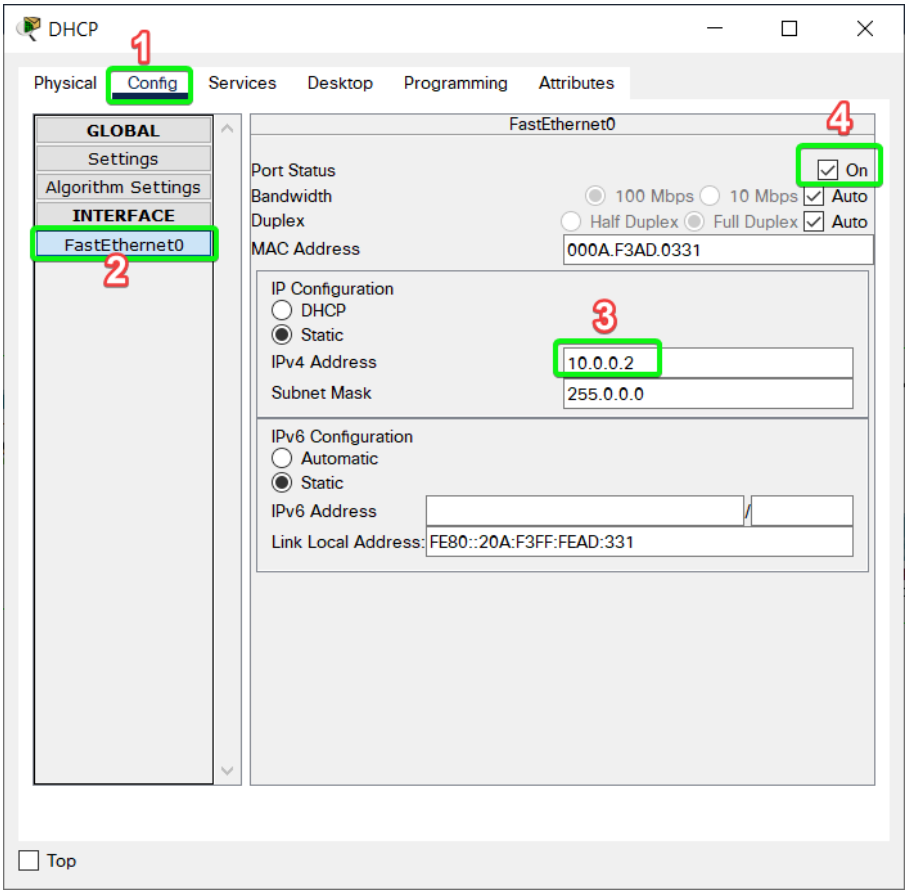
Once this is Complete, you should be able to add 4 different networks to the Router.

Step 2 : DHCP SERVER CONFIGURATION

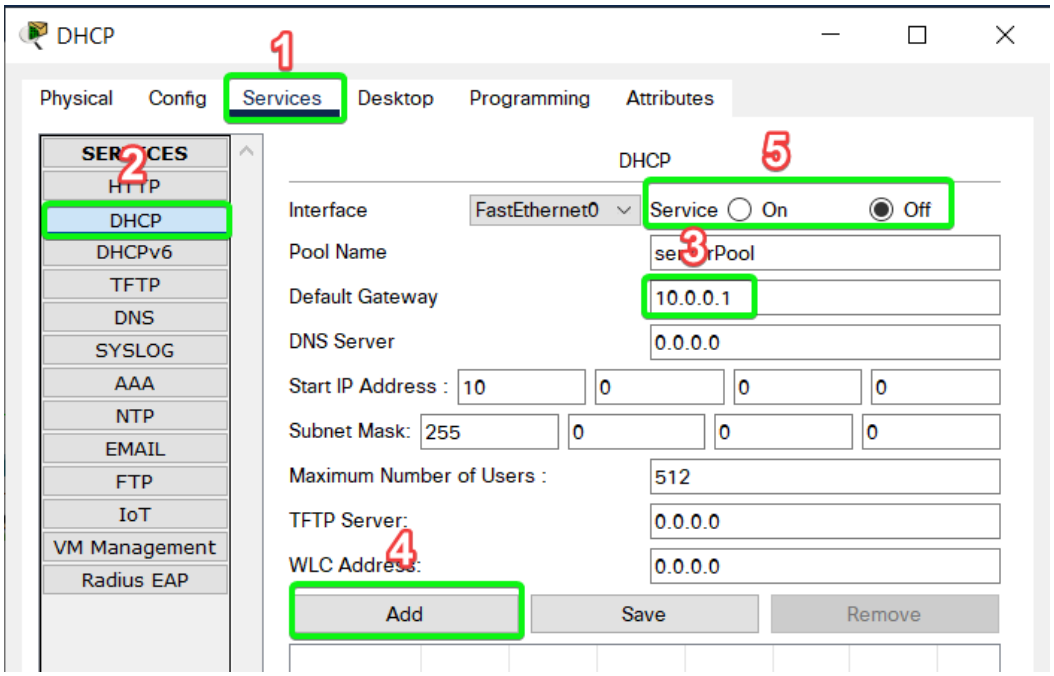
Select the **Server** to open up its **Configuration** terminal and then select **setting** and set it to static with default gateway as "**10.0.0.1**" (the network server is connected to).

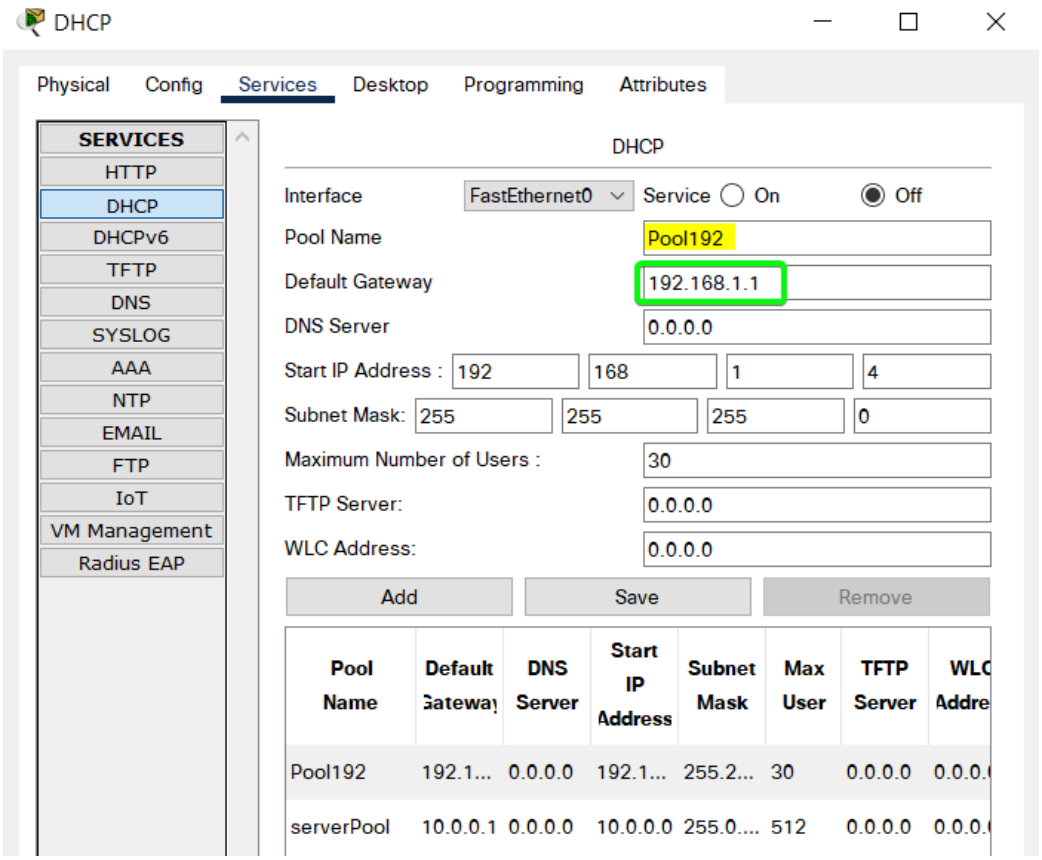


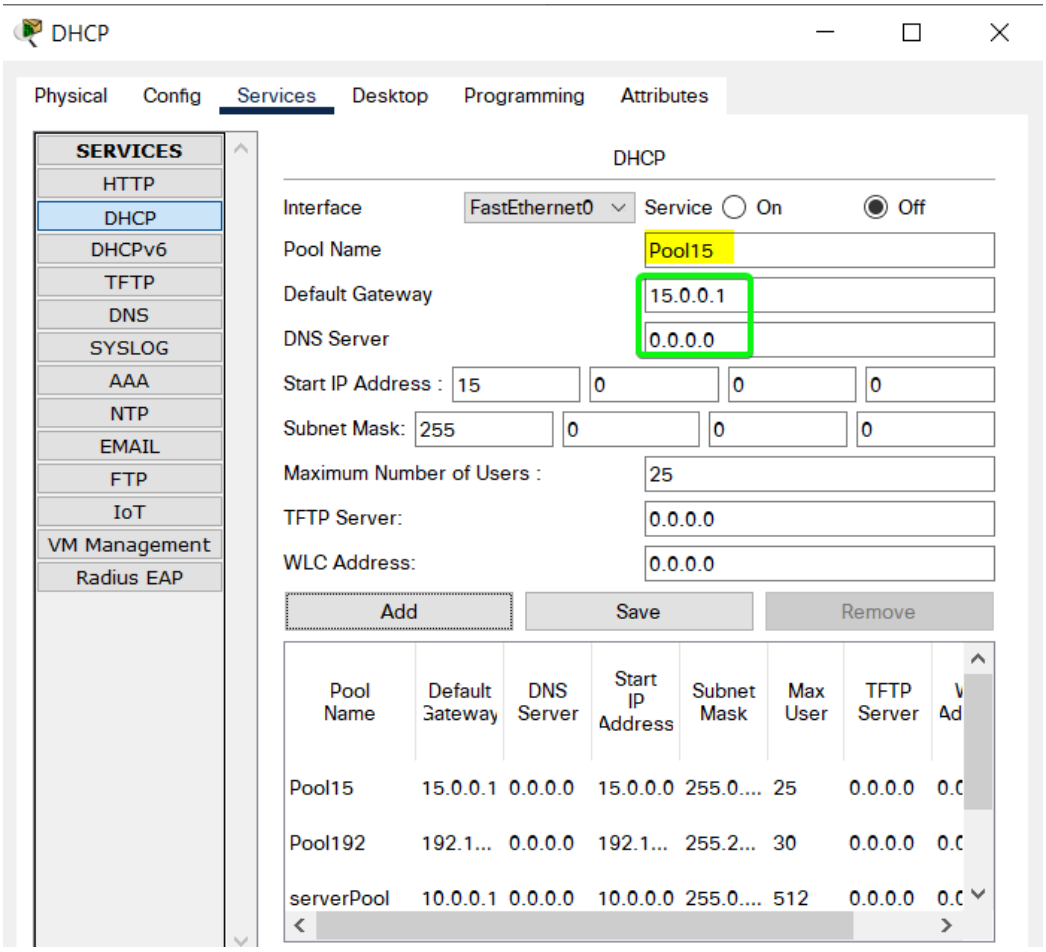
Then Select **FastEthernet0** and set the IPv4 address to **10.0.0.2** with Subnet Mask **255.0.0.0** {automatically appear} which is also in static. Then set the port status to "**ON**".



Now select **Services** from top bar and then select **DHCP** and now set the starting IP of each network. Here we would set for 4 networks "**192.168.1.1**", "**15.0.0.1**", "**21.0.0.1**", "**10.0.0.1**".




DHCP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
Pool192
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
Start IP Address :
192
168
1
4
Subnet Mask:
255
255
255
0
Maximum Number of Users :
30
TFTP Server:
0.0.0.0
WLC Address:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gateway
DNS Server
Start IP Address
Subnet Mask
Max User
TFTP Server
WLC Addre
Pool192
192.1...
0.0.0.0
192.1...
255.2...
30
0.0.0.0
serverPool
10.0.0.1
0.0.0.0
10.0.0.0
255.0....
512
0.0.0.0


DHCP
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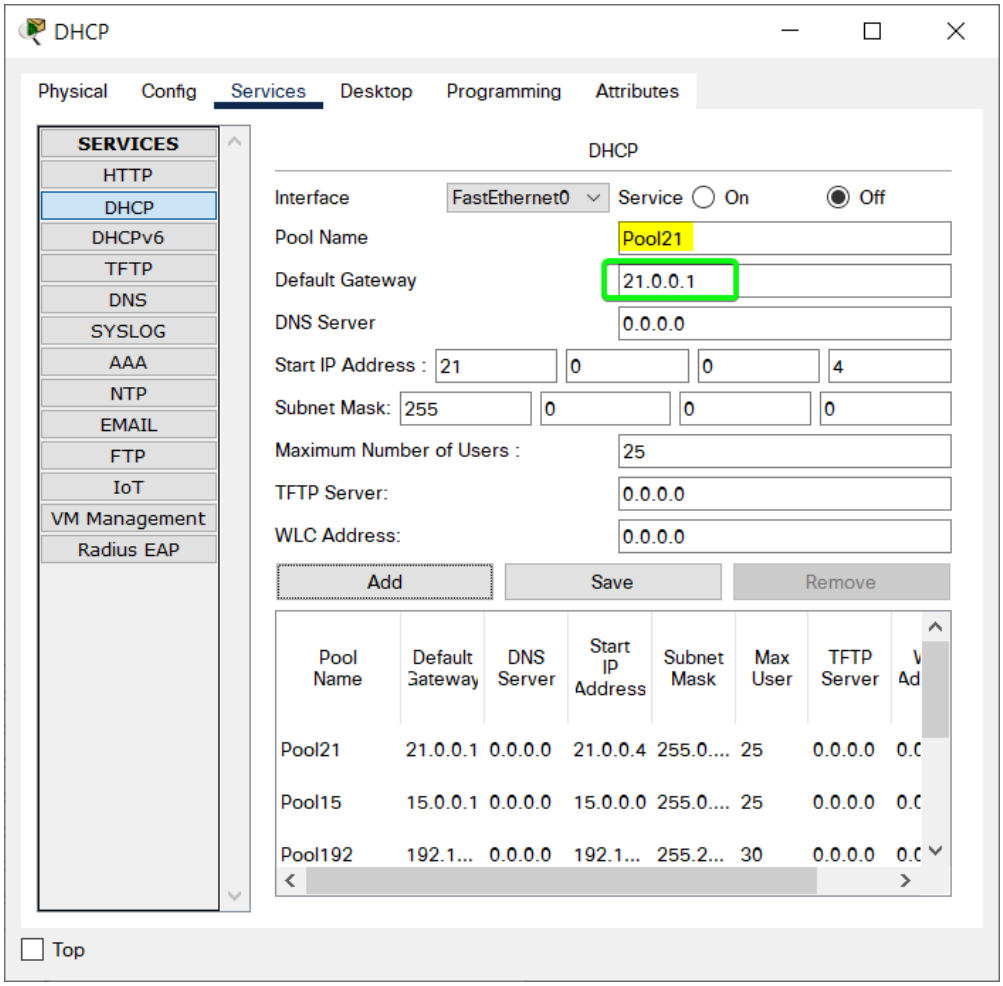
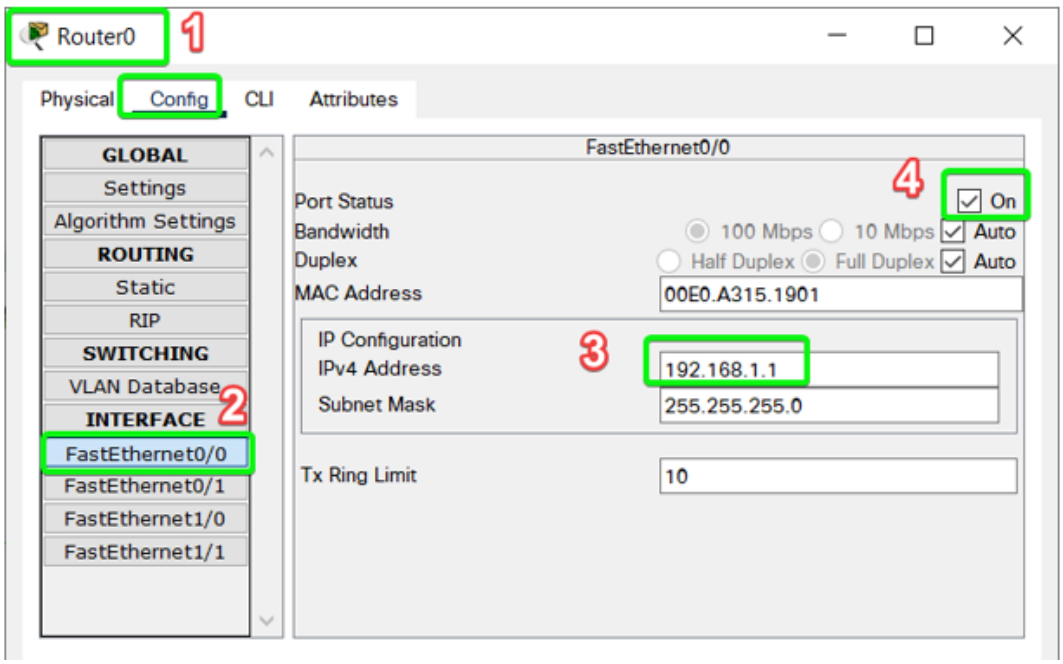
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
Pool15
Default Gateway
15.0.0.1
DNS Server
0.0.0.0
Start IP Address :
15
0
0
0
Subnet Mask:
255
0
0
0
Maximum Number of Users :
25
TFTP Server:
0.0.0.0
WLC Address:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gateway
DNS Server
Start IP Address
Subnet Mask
Max User
TFTP Server
Pool15
15.0.0.1
0.0.0.0
15.0.0.0
255.0....
25
0.0.0.0
Pool192
192.1...
0.0.0.0
192.1...
255.2...
30
0.0.0.0
serverPool
10.0.0.1
0.0.0.0
10.0.0.0
255.0....
512
0.0.0.0



After all the DHCP pools are created, set the service status to "**ON**"

Step 3 : ROUTER CONFIGURATION

Now that the server is set, we need to **configure out router** accordingly so first, set the IP's of each port according to figure in Layout above. Do the same to all ports as shown below.



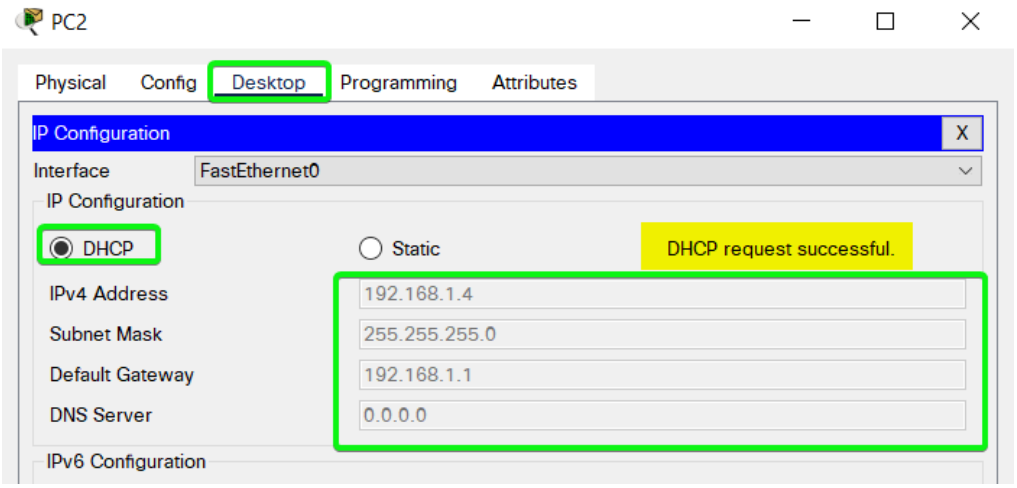
Now, Open CLI and Run the Following Command:

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#int fa0/0
Router(config-if)#ip help
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#no shutdown
Router(config-if)#do write
Building configuration...
[OK]
Router(config-if)#int fa0/1
Router(config-if)#ip help
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#no shutdown
Router(config-if)#do write
Building configuration...
[OK]
Router(config-if)#int fa1/0
Router(config-if)#ip help
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#no shutdown
Router(config-if)#do write
Building configuration...
[OK]
Router(config-if)#int fa1/1
Router(config-if)#ip help
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#no shutdown
Router(config-if)#do write
Building configuration...
[OK]
Router(config-if)#
```

This should make any DHCP IP request from any network to go directly to the server.

Step 4: END DEVICE CONFIGURATION

Set the **IP Config** mode from Static to DHCP as shown.

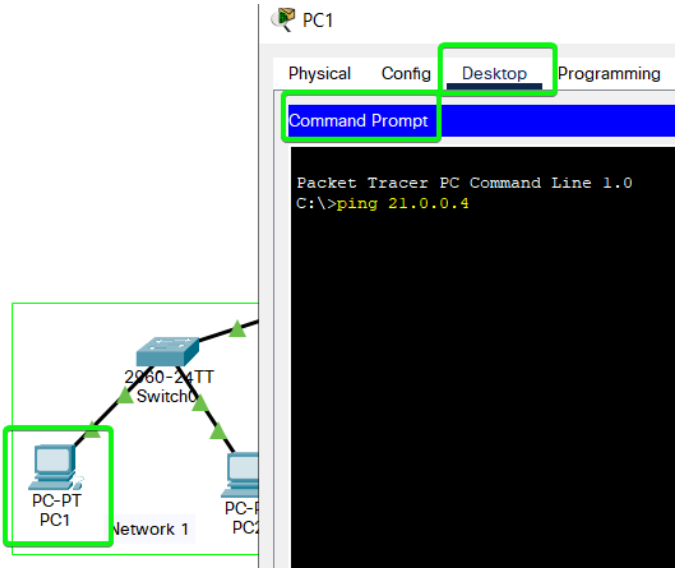


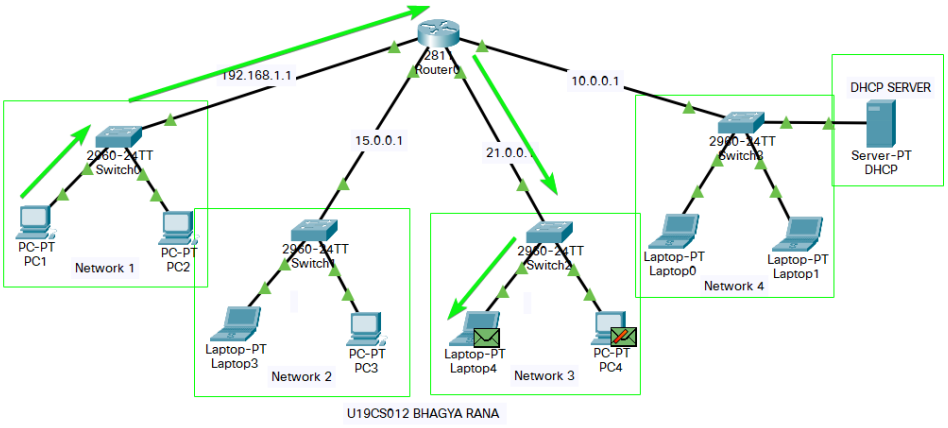
Do Similar Step for All the End Devices {PC's & Laptop's}.

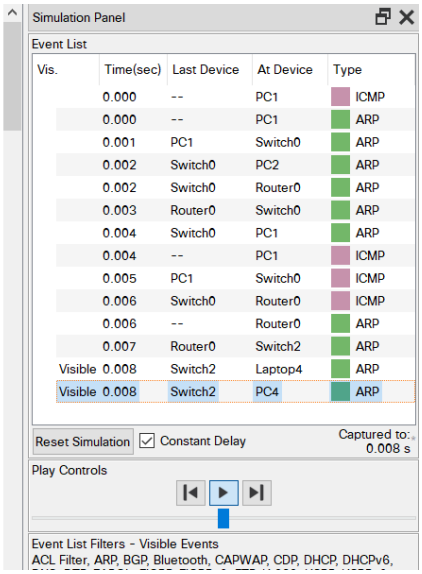
After few seconds it should get assigned a unique IP. Do this to all the end devices.

Step 5: SIMULATION

From PC1 with IP **192.168.1.5** we would ping Laptop4 with IP **21.0.0.4**.








```
C:\>ping 21.0.0.4

Pinging 21.0.0.4 with 32 bytes of data:

Reply from 21.0.0.4: bytes=32 time=8ms TTL=127
Reply from 21.0.0.4: bytes=32 time=8ms TTL=127
Reply from 21.0.0.4: bytes=32 time=8ms TTL=127
Reply from 21.0.0.4: bytes=32 time=8ms TTL=127

Ping statistics for 21.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 8ms, Average = 8ms

C:\>
```


SUBMITTED BY:

U19CS012

BHAGYA VINOD RANA