Name: Brijesh Rameshbhai Rohit
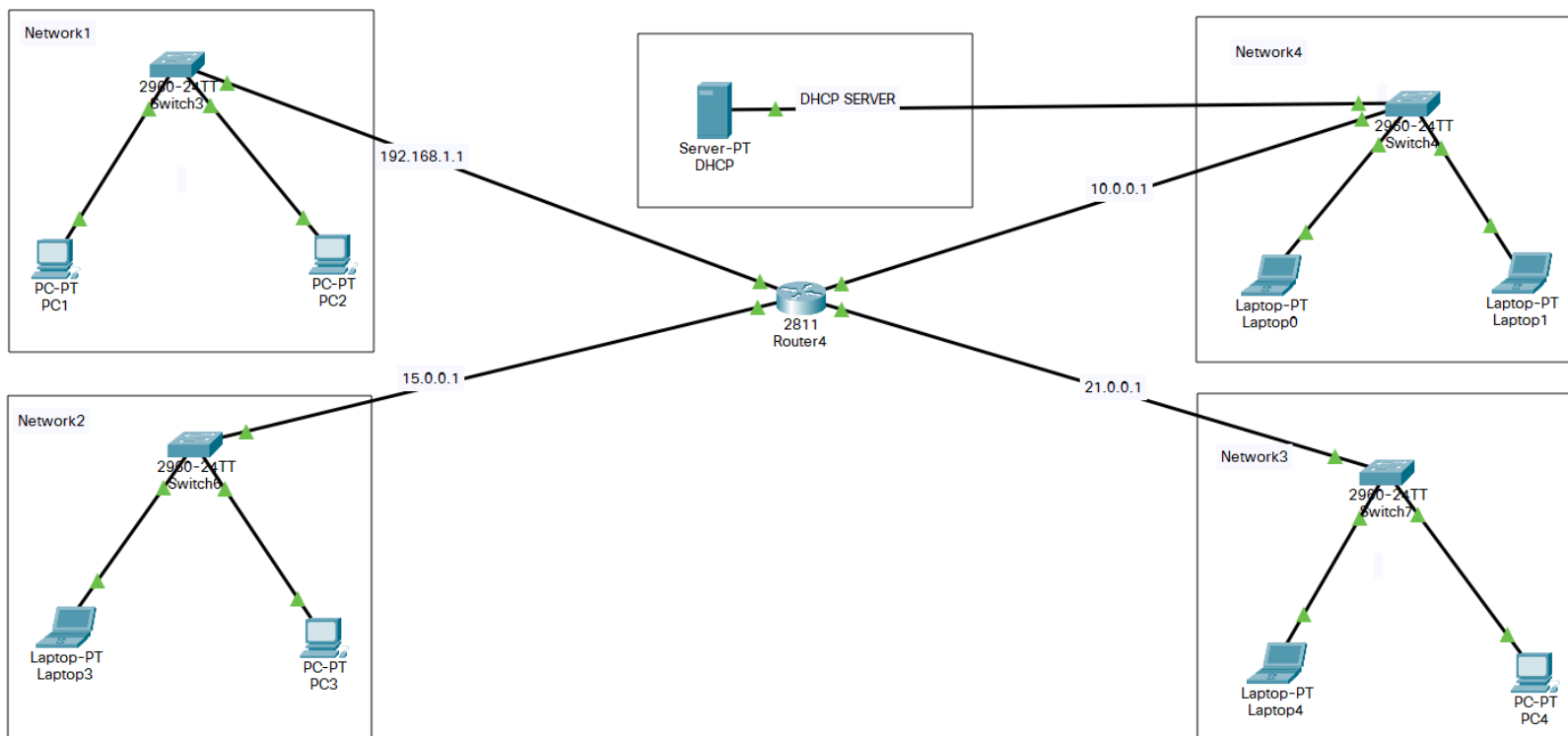
Admission number: U19CS009

CN-ASSIGNMENT-10

Create Manual to create network topology
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.
Perform one transmission between two systems belonging to different networks
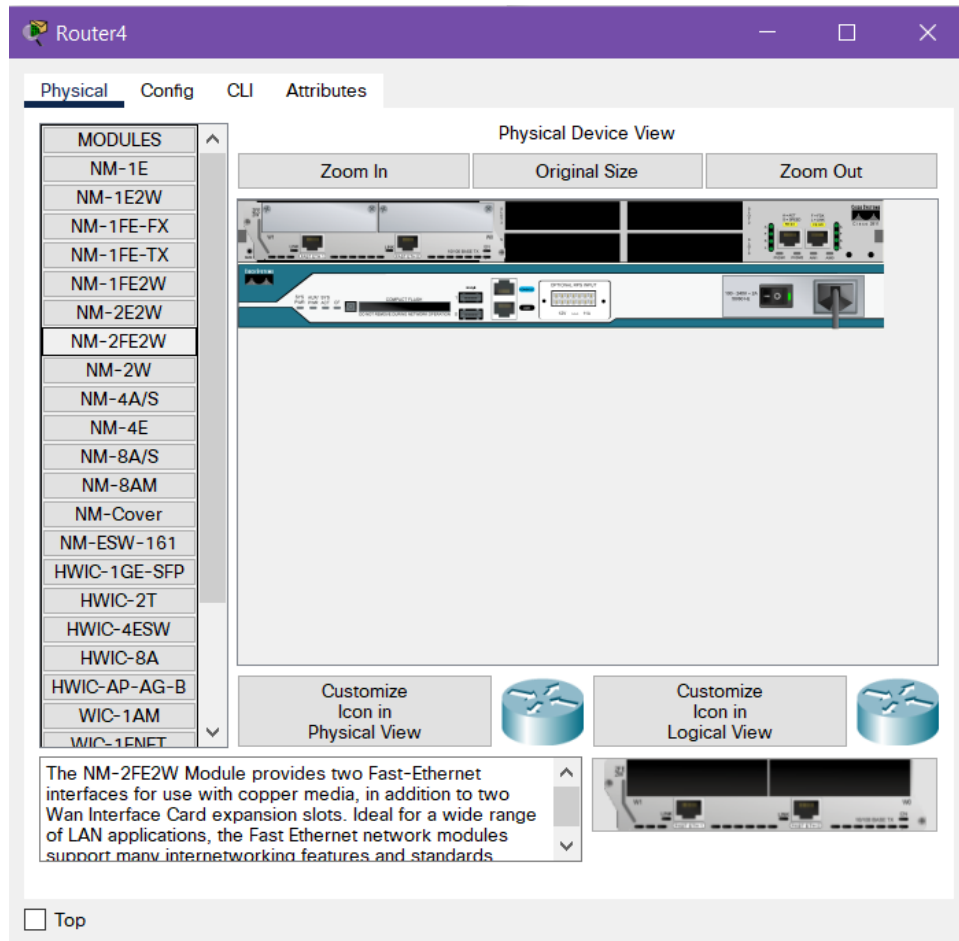
1. Layout:

Following is network created:

To connect more than 2 networks with routers we need to add modules to it.

We are using router 2811 so go to the physical configuration and add module "NM-2FE2W"
which enables 2 more fastethernet ports.

Once this is complete you should be able to add 4 different networks to the router.

2. DHCP Server Configuration

Select the Server to open 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).
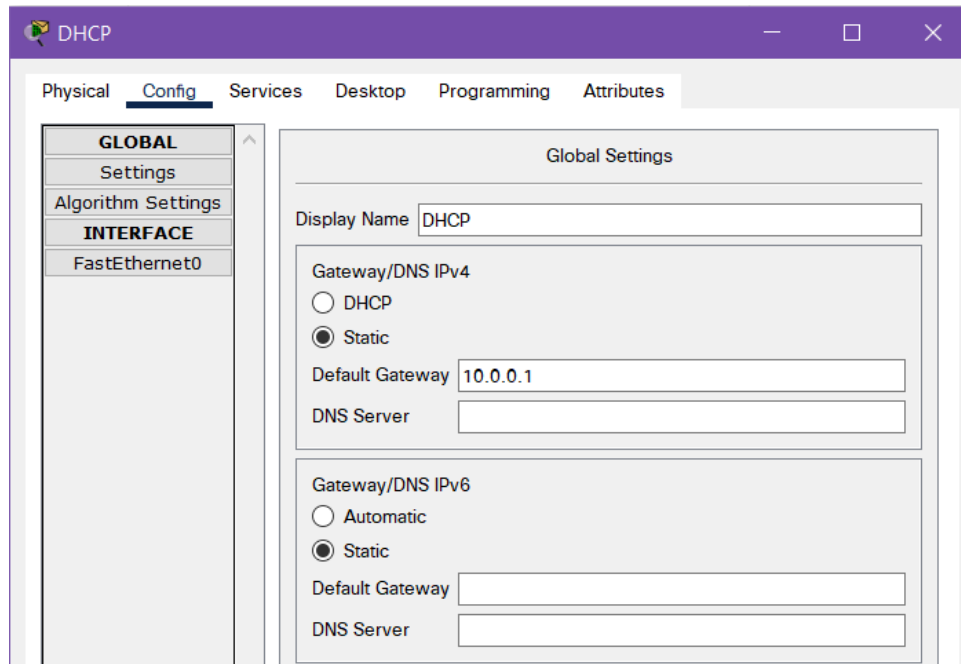
Then select FastEthernet0 and set the IPv4 address to 10.0.0.2 with subnet mask 255.0.0.0 which is also in static. Then set the port status to "ON".
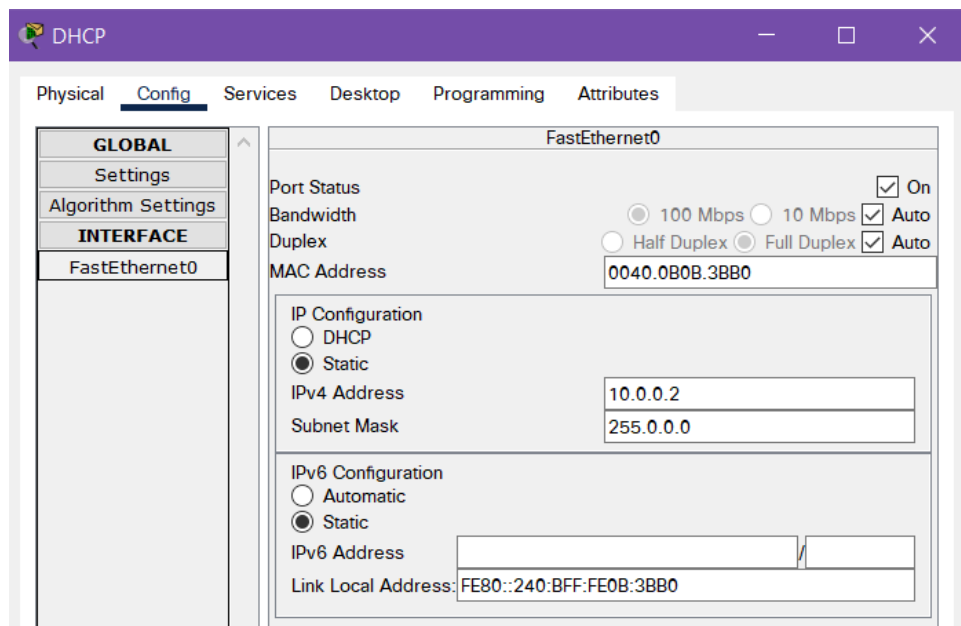
Now select Services from top bar and then select DHCP.

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 — Window 1 (top-left)

SERVICES
HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, Radius EAP

DHCP

Field	Value
Interface	FastEthernet0
Service	● On ○ Off
Pool Name	Pool10
Default Gateway	10.0.0.1
DNS Server	0.0.0.0
Start IP Address	10 . 0 . 0 . 4
Subnet Mask	255 . 0 . 0 . 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	WL Addr
serverPool	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	512	0.0.0.0	0.0.0.
Pool10	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	30	0.0.0.0	0.0.0.
Pool192	192.168...	0.0.0.0	192.168...	255.255...	30	0.0.0.0	0.0.0.

☐ Top

DHCP — Window 2 (top-right)

SERVICES
HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, Radius EAP

DHCP

Field	Value
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 . 4
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	WL Addr
pool21	21.0.0.1	0.0.0.0	21.0.0.4	255.0.0.0	25	0.0.0.0	0.0.0.
pool15	15.0.0.1	0.0.0.0	15.0.0.4	255.0.0.0	25	0.0.0.0	0.0.0.
serverPool	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	512	0.0.0.0	0.0.0.

☐ Top

DHCP — Window 3 (bottom-left)

SERVICES
HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, Radius EAP

DHCP

Field	Value
Interface	FastEthernet0
Service	● On ○ Off
Pool Name	pool21
Default Gateway	21.0.0.1
DNS Server	0.0.0.0
Start IP Address	21 . 0 . 0 . 4
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	WL Addr
pool21	21.0.0.1	0.0.0.0	21.0.0.4	255.0.0.0	25	0.0.0.0	0.0.0.
pool15	15.0.0.1	0.0.0.0	15.0.0.4	255.0.0.0	25	0.0.0.0	0.0.0.
serverPool	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	512	0.0.0.0	0.0.0.

☐ Top

DHCP — Window 4 (bottom-right)

SERVICES
HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, Radius EAP

DHCP

Field	Value
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	WL Addr
serverPool	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	512	0.0.0.0	0.0.0.
Pool10	10.0.0.1	0.0.0.0	10.0.0.4	255.0.0.0	30	0.0.0.0	0.0.0.
Pool192	192.168...	0.0.0.0	192.168...	255.255...	30	0.0.0.0	0.0.0.

☐ Top

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

3. Router Configuration

Now that the server is set, we need to configure out router accordingly so first, set the Ips Each port according to figure in Layout above. Do the same to all ports as shown below.

In CLI run following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
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)#exit
Router(config)#int fa0/1
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)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#exit
Router(config)#int fa1/0
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)#exit
Router(config)#int fa1/1
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)#
```
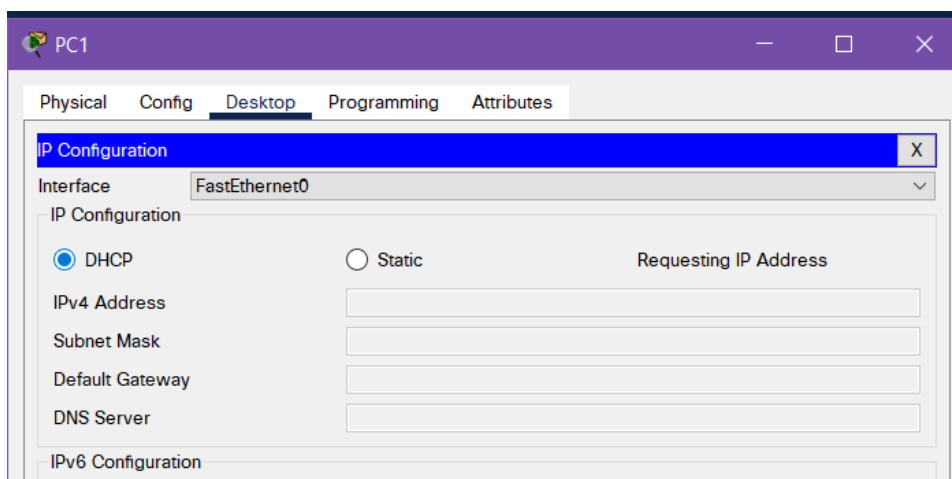
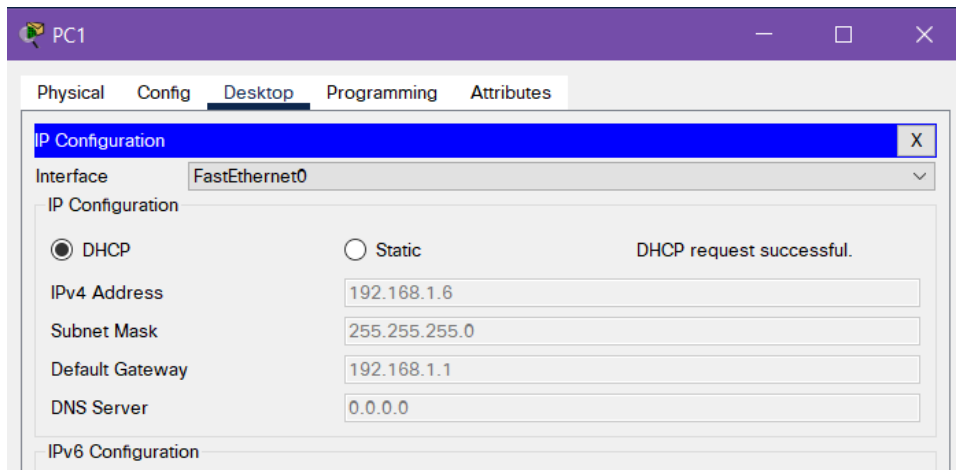Ctrl+F6 to exit CLI focus   Copy   Paste

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

4. End Device Configuration

Set the IP config mode from static to DHCP as shown.

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

5. Simulation

From PC1 with IP 192.168.1.6 we would ping Laptop3 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<1ms TTL=127
Reply from 21.0.0.4: bytes=32 time<1ms TTL=127
Reply from 21.0.0.4: bytes=32 time<1ms TTL=127
Reply from 21.0.0.4: bytes=32 time<1ms 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 = 0ms, Maximum = 0ms, Average = 0ms
```