Computer Networks (CS303)

Assignment - 9

U19CS012

DHCP

- ✓ The **D**ynamic **H**ost **C**onfiguration **P**rotocol is a Network Protocol which functions at the **Application Layer** of the Internet Protocol (IP) suite.
- ✓ A Server which uses DHCP will be able to **Dynamically Assign IP** Addresses and other network configuration parameters to devices on the network; hence, Allowing communication to a Second Network.

How Does DHCP Work?

Advantages of using DHCP:

- ✓ **Centralized Management** of IP addresses
- ✓ **Ease** of Adding New clients to a network {Scalable}
- ✓ Reuse of IP addresses reducing the total number of IP addresses that are required
- ✓ Simple Reconfiguration of the IP address space on the DHCP server without needing to reconfigure each client

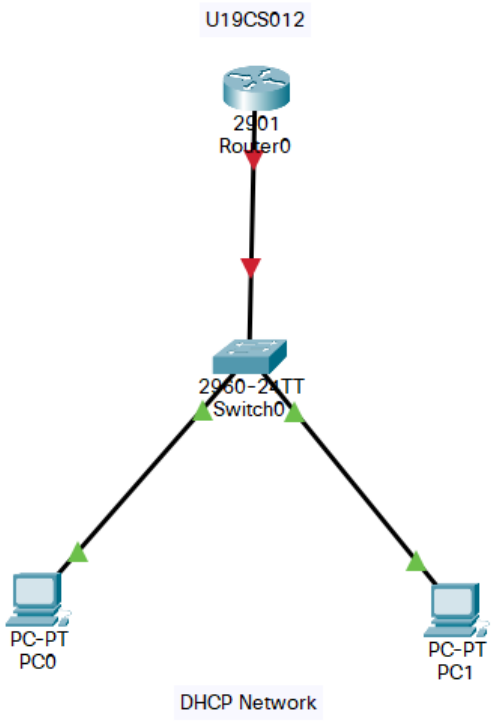
Disadvantages of using DHCP:

- ✓ **IP conflict** can occur

Create Manual to Create Two Network Topologies.

1.) Single Network Connected to One Router [Note: Router should work as DHCP server and Assign IP Address.]

Step 1: Select the End Devices [PC, Switch and Router] and connect them as shown below.



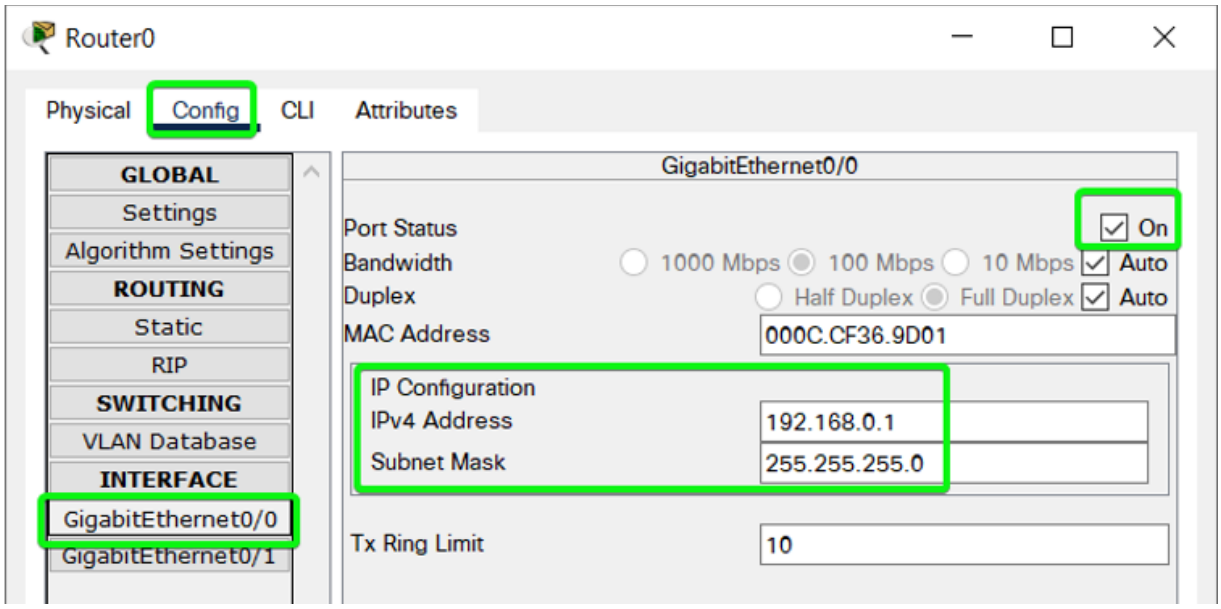
Step 2: Configure the Router

(A) CLI

```
Would you like to enter the initial configuration dialog? [yes/no]: no


Press RETURN to get started!



Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gi
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed
state to up
```

OR

(B) Without CLI



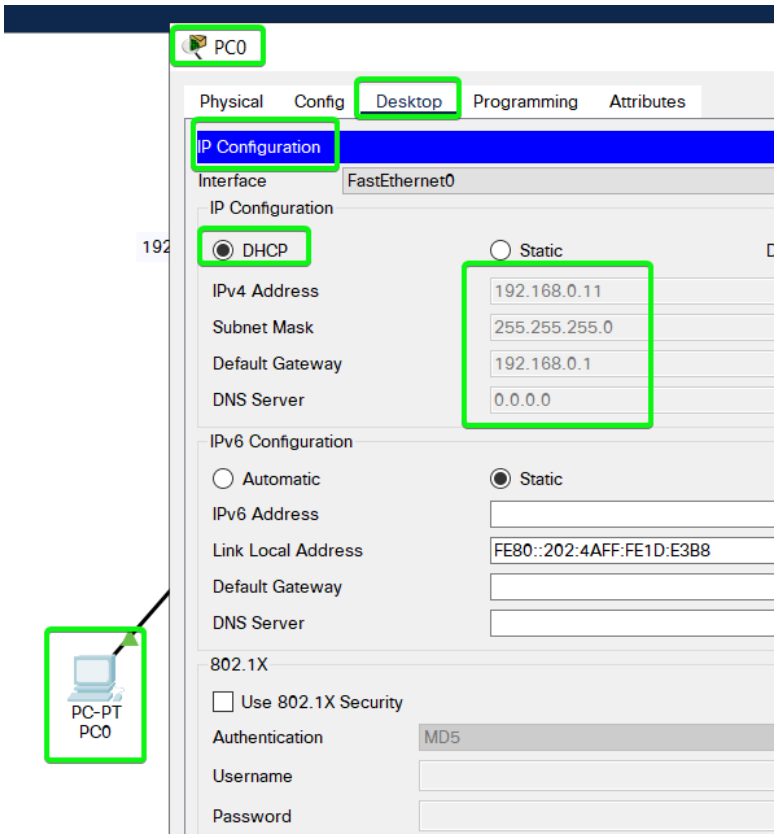
Step 3: Create s DHCP Pool named '**bhagya**' & Give it Network Address and also set it as Default Gateway for Router.

```
Router(config)#interface GigabitEthernet0/0
Router(config-if)#exit
Router(config)#ip dhcp pool bhagya
Router(dhcp-config)#network 192.168.0.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.0.1
Router(dhcp-config)#exit
Router(config)#
```

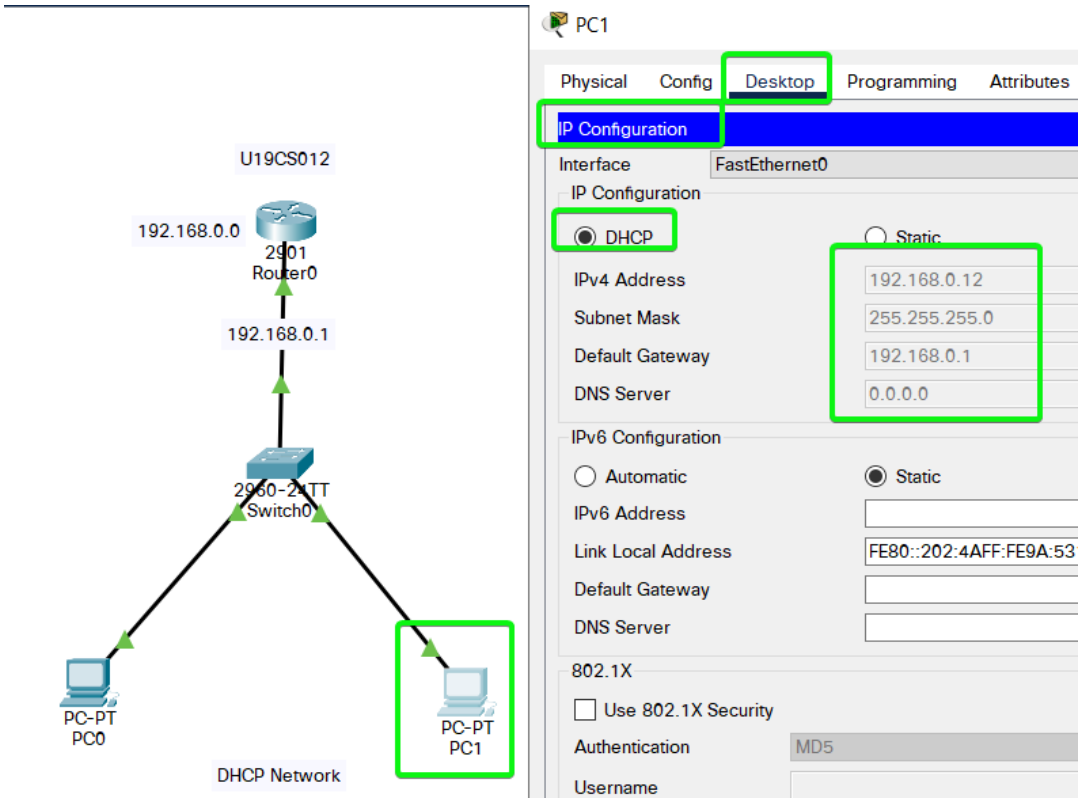
Step 4: Also we can exclude some IP Address [They should not be assigned to any of the Systems]

```
Router(config)#ip dhcp excluded-address 192.169.0.1 192.169.0.5
Router(config)#exit
```

Step 5: Change the IP Configuration of Each of PC to DHCP.



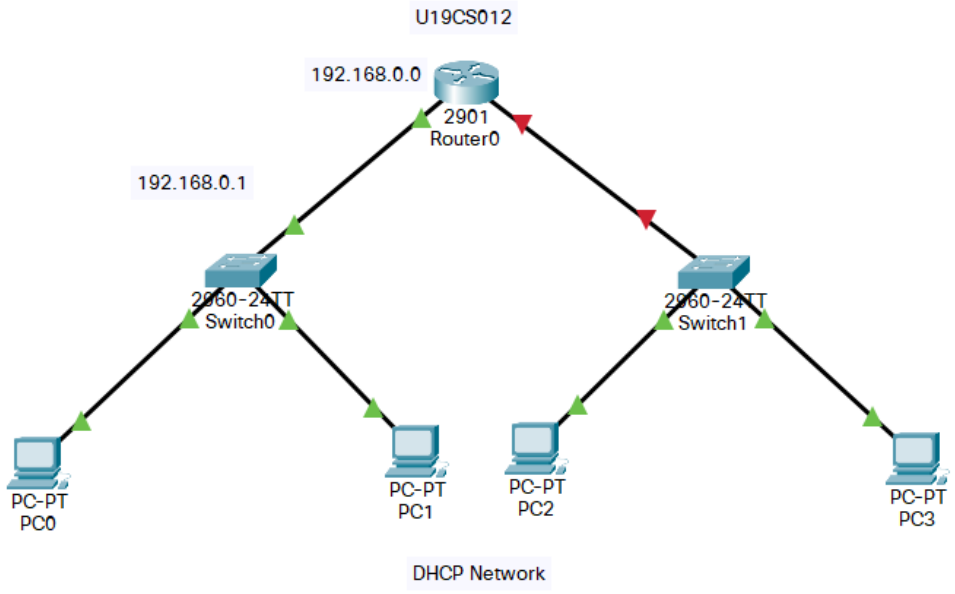
We can Notice that the IP Address of New PC is set to 192.168.0.11 {After the Excluded IP Range}



2. More than 1 Network are Connected to One Router.

[Note: Router should work as DHCP server and Assign IP Address.]

Step 1: Select the End Devices [PC, Switch and Router] and connect them as shown below.



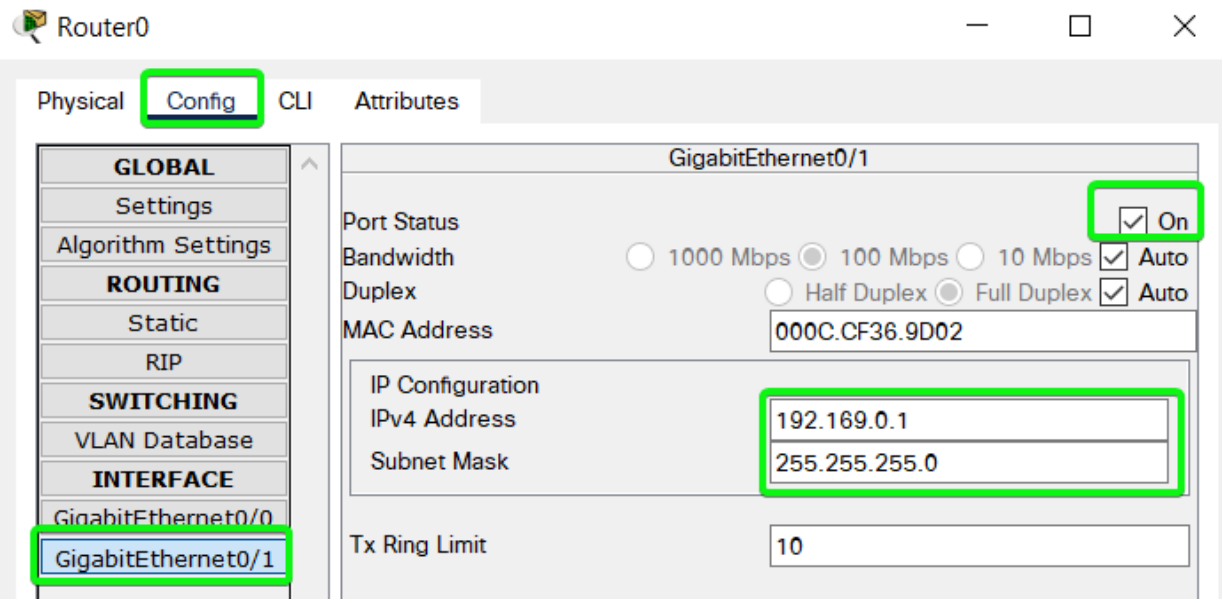
Step 2: Configure the Router

(A) CLI

```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gi
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#ip address 192.168.0.2 255.255.255.0
% 192.168.0.0 overlaps with GigabitEthernet0/0
Router(config-if)#ip address 192.169.0.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed
state to up
```

OR

(B) Without CLI



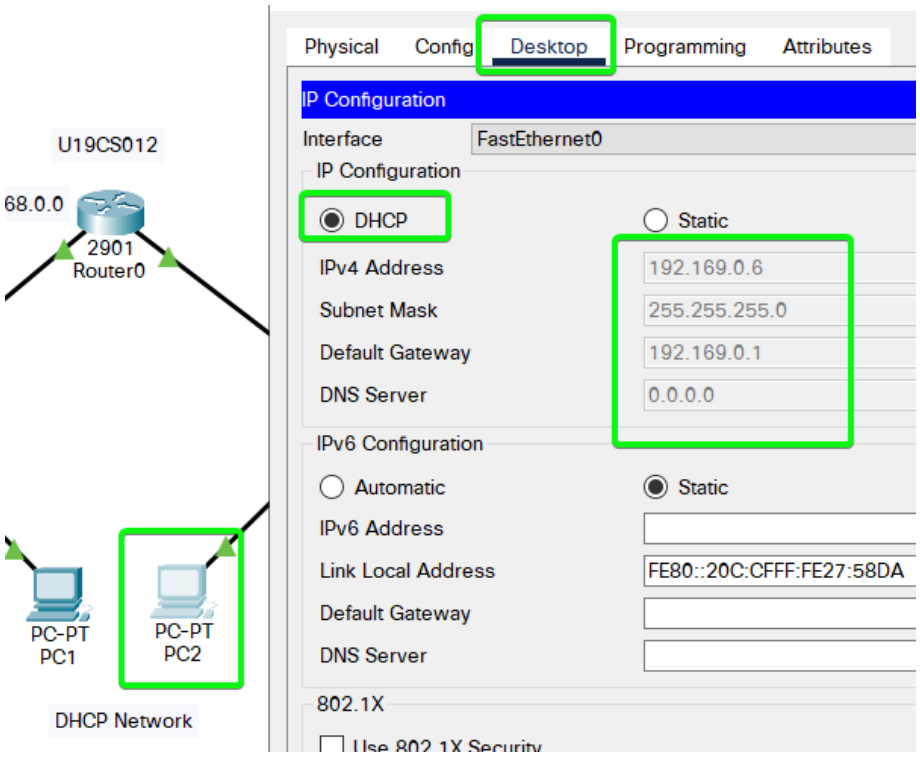
Step 3: Create s DHCP Pool named '**bhagya2**' & Give it Network Address and also set it as Default Gateway for Router.

```
Router(config)#ip dhcp pool bhagya2
Router(dhcp-config)#network 192.169.0.0 255.255.255.0
Router(dhcp-config)#default-router 192.169.0.1
Router(dhcp-config)#exit
Router(config)#
```

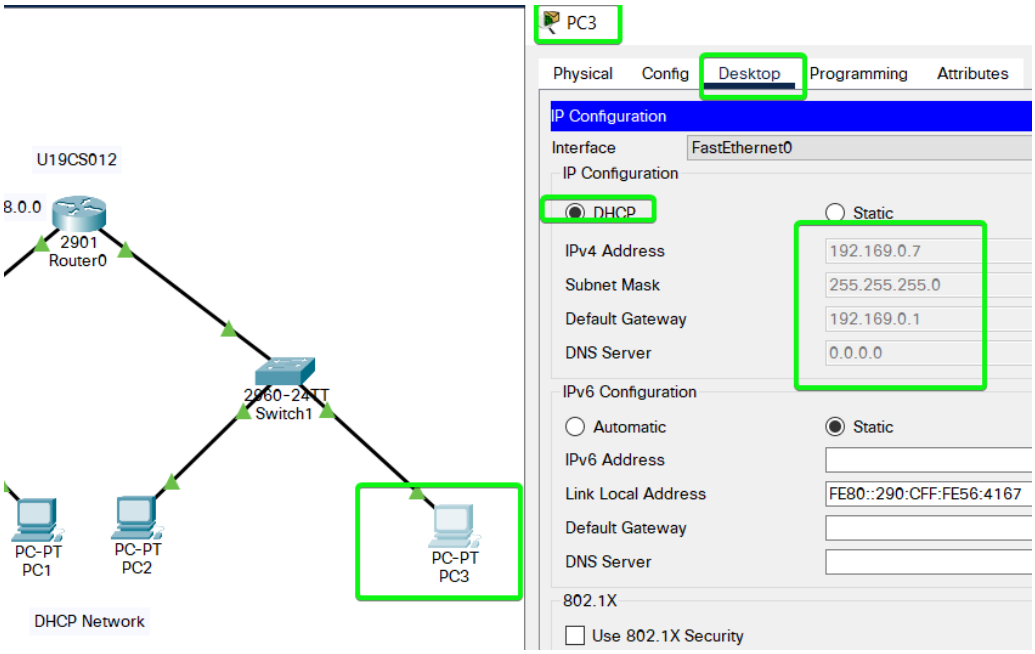
Step 4: Also we can exclude some IP Address [They should not be assigned to any of the Systems]

```
Router(config)#ip dhcp excluded-address 192.169.0.1 192.168.0.5
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Step 5: Change the IP Configuration of Each of PC to DHCP.



We can Notice that the IP Address of New PC is set to 192.169.0.6 {After the Excluded IP Range}



Therefore, we have successfully Implemented Two Networks and Router as DHCP server.

SUBMITTED BY:

U19CS012

BHAGYA VINOD RANA