

## **LAB NO: 8**

### **Configuring DHCP server on Cisco Router**

#### **Objective:**

To configure a Cisco router to act as a Dynamic Host Configuration Protocol (DHCP) server and dynamically assign IP addresses to clients in a local network.

#### **Apparatus Required:**

- Cisco Packet Tracer software
- PCs (or network devices) to act as DHCP clients
- Network cables for connecting devices
- A router (Cisco 1841)
- A switch (if multiple clients are used)

#### **Theory:**

DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to automatically assign IP addresses, subnet masks, default gateways, and DNS server information to network devices. A router configured as a DHCP server can dynamically assign these details to clients in a specified IP range, reducing the need for manual IP configuration.

#### **Steps Involved in DHCP Configuration:**

The steps provided below can be followed to configure DHCP on the Cisco Router to assign a dynamic IP address to host systems deployed in the network:

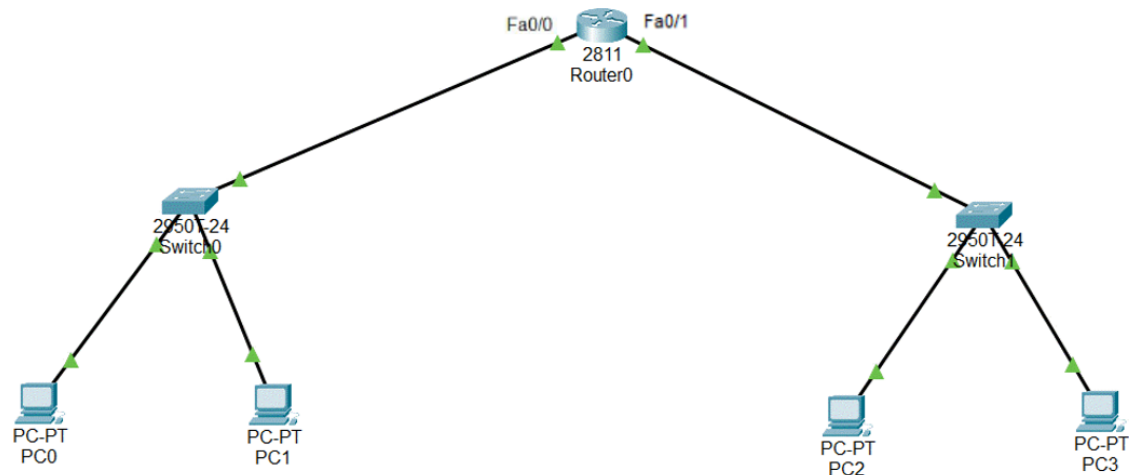
##### **Step-1: Network Setup:**

Design the network by connecting the router to the switch and use an Automatic connecting cable to connect multiple PCs or devices to the switch as shown in Figure 1.

##### **Step-2: Configuring the Router as a DHCP Server:**

- **Access the Router's CLI (Command Line Interface)**

Use the console connection to access the router's CLI.



**Figure 1: DHCP Configuration**

```

Router0
Physical Config CLI Attributes
IOS Command Line Interface
Would you like to enter the initial configuration dialog? [yes/no]: N

Press RETURN to get started!

Router>en
Router#enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool net1
Router(dhcp-config)#network 192.168.0.1 255.255.255.0
Router(dhcp-config)#exit
Router(config)#int fa0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool net2
Router(dhcp-config)#network 192.168.1.1 255.255.255.0
Router(dhcp-config)#exit
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#

```

**Figure 2: The Router's CLI**

**Step-3: Configuring Router with IPv4 Address and Subnet Mask.**

**IP Addressing Table for Router:**

S.NO	Device	Interface	IPv4 Address	Subnet Mask
1.	router0	FastEthernet0/0	192.168.0.1	255.255.255.0
		FastEthernet0/1	192.168.1.1	255.255.255.0

- To assign an IP address in router0, click on router0.
- Then, go to config and then Interfaces, and make sure to turn on the ports.
- Then, configure the IP address in FastEthernet according to IP addressing Table.
- Fill IPv4 address and subnet mask.

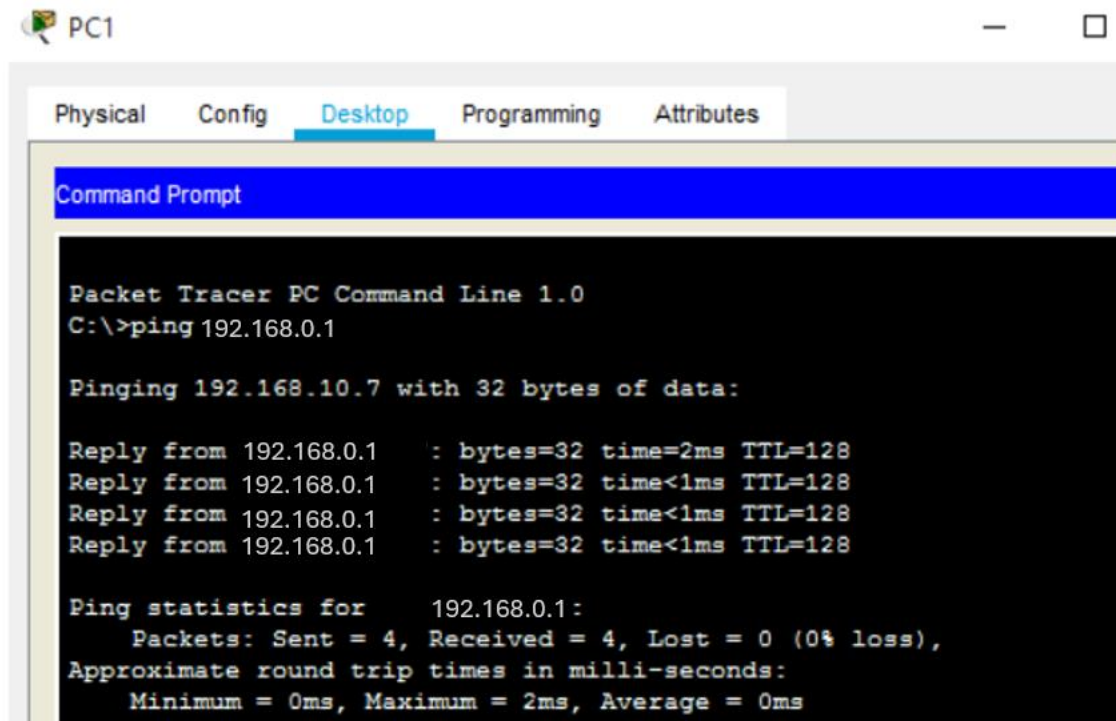
**Step 4: Configuring the PCs and changing the IP configuration.**

- To assign an IP address in PC3, click on PC3.
- Then, go to desktop and IP configuration and there you will find IPv4 configuration.
- Change its state from static to DHCP.
- It will automatically fetch the data and configure itself.

The screenshot shows the configuration window for PC3. The 'Desktop' tab is selected. Under 'IP Configuration', the 'FastEthernet0' interface is shown. The 'DHCP' radio button is selected, and a message 'DHCP request successful.' is displayed. The 'IPv4 Address' is 192.168.1.3, and the 'Subnet Mask' is 255.255.255.0. The 'IPv6 Configuration' section shows the 'Static' radio button selected. The 'Link Local Address' is FE80::205:5EFF:FE48:EADE. The '802.1X' section shows 'Use 802.1X Security' unchecked, 'Authentication' set to MD5, and fields for 'Username' and 'Password'.

**Step 5:** Repeat the same procedure with other PCs to configure them thoroughly.

**Step-6 :** To check the connectivity between the host systems, the 'ping' command is used to exchange data packets. All the data packets are successfully transferred, which ensures that a communication channel is established.



The screenshot shows the Packet Tracer interface for PC1. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the 'ping 192.168.0.1' command, which successfully pings the destination IP address. The output indicates that 4 packets were sent and received with 0% loss, and the round trip times are very low (0ms to 2ms).

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.1

Pinging 192.168.10.7 with 32 bytes of data:

Reply from 192.168.0.1    : bytes=32 time=2ms TTL=128
Reply from 192.168.0.1    : bytes=32 time<1ms TTL=128
Reply from 192.168.0.1    : bytes=32 time<1ms TTL=128
Reply from 192.168.0.1    : bytes=32 time<1ms TTL=128

Ping statistics for      192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

*Connectivity Testing*