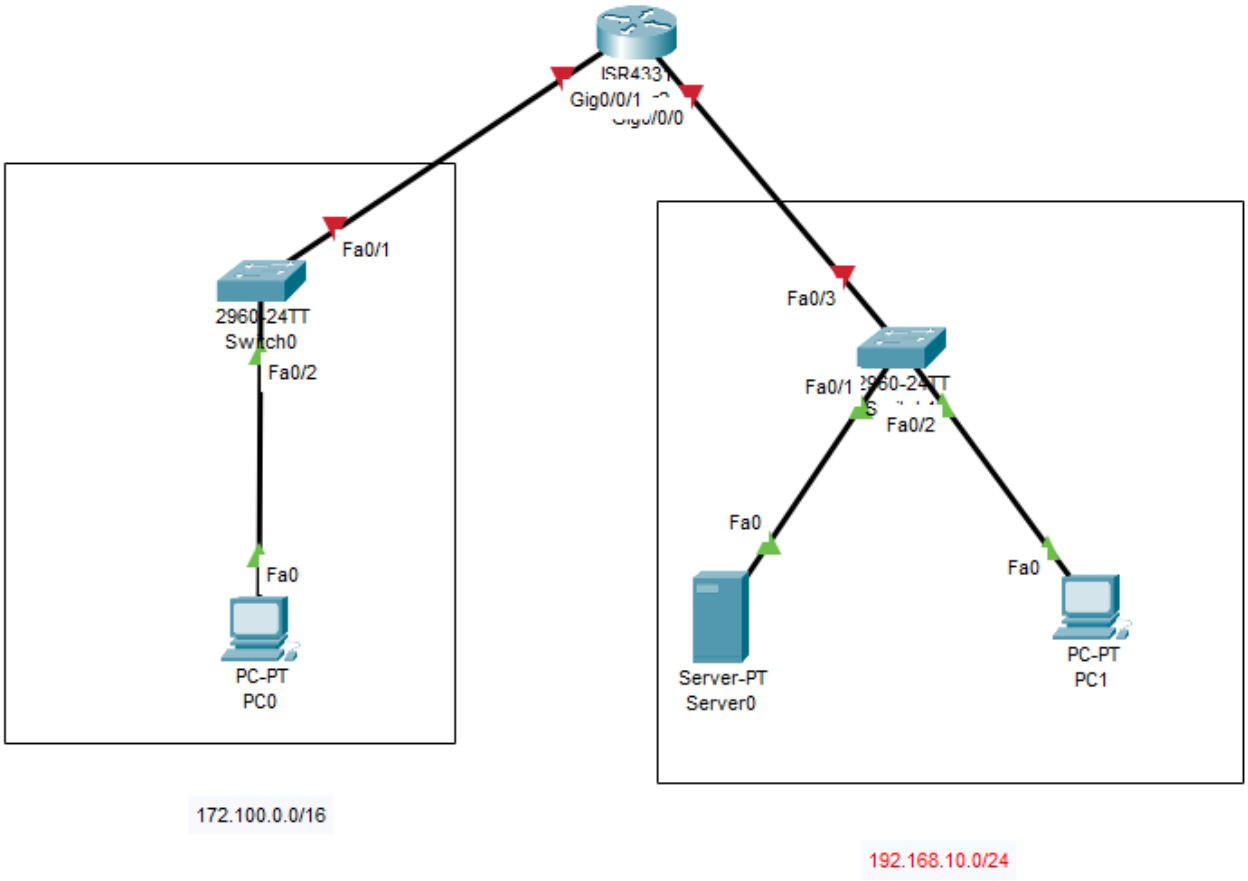
# LAB 2 DHCP server Configuration and Usage

DHCP is a network management protocol used in networks to dynamically assign IP addresses and other network configuration information like default gateway, mask, DNS server address, etc. It is an application layer protocol.

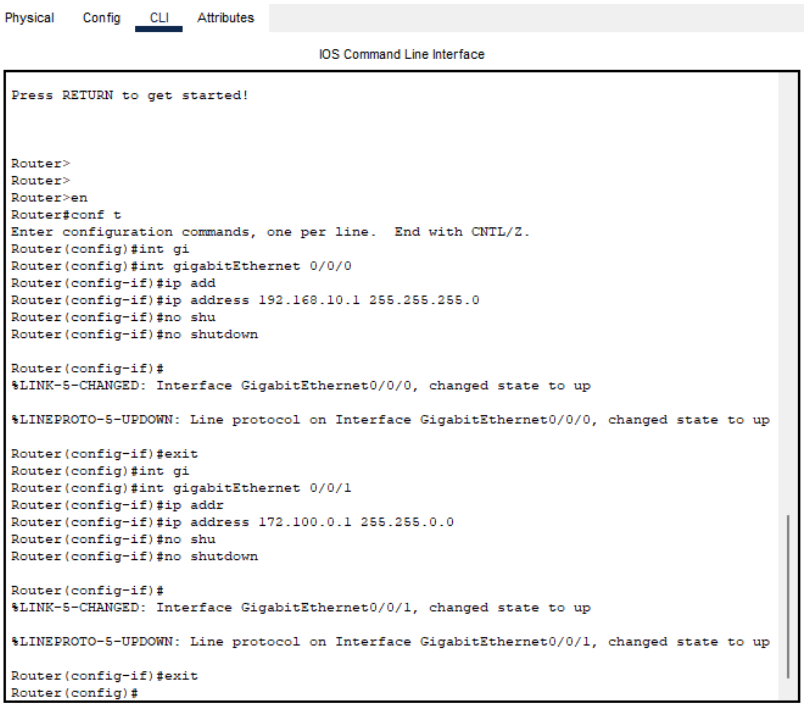
## Step 1 :Lab Topology

First, open the cisco packet tracer desktop and select the devices given below:




## Step 2: Configure Router Interfaces

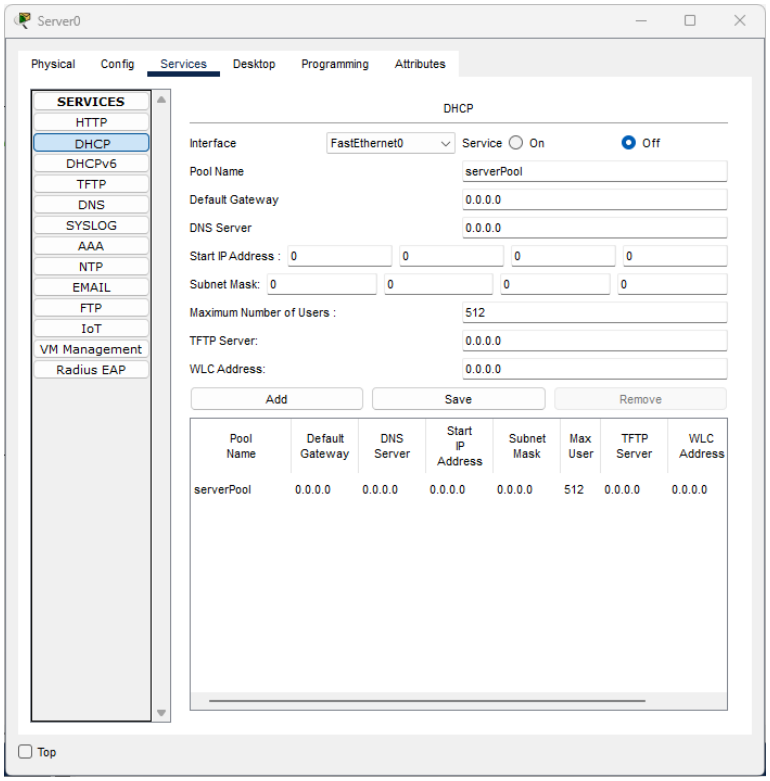
1. Open the CLI of Router0.
2. Configure the interfaces with static IP addresses:




## Step 3: Configure the DHCP Server

192.168.1.2 is the IP address of the DHCP server.

1. Click on the DHCP server and go to the **Services** tab.
2. Enable the DHCP service.
3. Create two DHCP pools:
    - **Pool for Subnet 1 (192.168.10.0/24)**:
        - Pool Name: Pool1
        - Default Gateway: 192.168.10.1
        - DNS Server: 8.8.8.8
        - Start IP Address: 192.168.1.10
        - Subnet Mask: 255.255.255.0
        - Maximum Number of Users: 50
    - **Pool for Subnet 2 (172.100.0.0/16)**:
        - Pool Name: Pool2
        - Default Gateway: 172.100.0.1
        - DNS Server: 8.8.8.8
        - Start IP Address: 172.100.0.10
        - Subnet Mask: 255.255.0.0
        - Maximum Number of Users: 1000




## Step 4: Configure Router as a DHCP Relay Agent

1. On Router0, configure the DHCP relay for both subnets:

```
Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip helper-address 192.168.1.2
Router(config-if)# exit
Router(config)# interface GigabitEthernet0/1
Router(config-if)# ip helper-address 192.168.1.2
Router(config-if)# exit
```

```
Router>
Router>
Router>
Router>
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int gi
Router(config)#int gigabitEthernet 0/0/0
Router(config-if)#ip help
Router(config-if)#ip helper-address 192.168.1.2
Router(config-if)#exit
Router(config)#int gi
Router(config)#int gigabitEthernet 0/0/1
Router(config-if)#ip help
Router(config-if)#ip helper-address 192.168.1.2
Router(config-if)#exit
Router(config)#
```

## Step 5: Configure PCs to Obtain IP Addresses Dynamically

1. On PC0 and PC1, go to the **Desktop** tab and open the **IP Configuration** window.
2. Set the IP configuration to **DHCP**.
3. Verify that the PCs receive IP addresses from the DHCP server:
    - PC1 should get an IP in the range 192.168.1.10-192.168.1.59.
    - PC0 should get an IP in the range 172.100.0.10-172.100.255.254.

## Step 6: Verify Connectivity

1. Use the ping command from PC0 to PC1 and vice versa to verify connectivity.
2. Check the DHCP server's logs to confirm that IP addresses were assigned correctly.
3. Add more PCs or devices to test the scalability of the DHCP pools.