

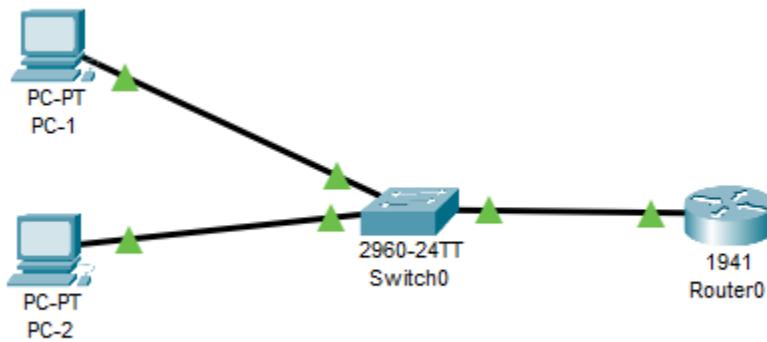
## Project-02: LAN with DHCP using Router

### 1. Objective

To configure a basic LAN where PCs get IP address automatically using DHCP configured on a router.

### 2. Network Topology

- One router
- One Layer-2 switch
- Two PCs
- Router connected to switch



### 3. IP Addressing

#### Router Interface

- IP Address: 192.168.1.1
- Subnet Mask: 255.255.255.0

#### DHCP Pool

- Network: 192.168.1.0 /24
- Default Gateway: 192.168.1.1

PCs receive IP address automatically using DHCP.

## 4. Configuration Steps

### Router Configuration (Key CLI Commands)

```
interface g0/1
```

```
ip address 192.168.1.1 255.255.255.0
```

```
no shutdown
```

```
ip dhcp excluded-address 192.168.1.1 192.168.1.10
```

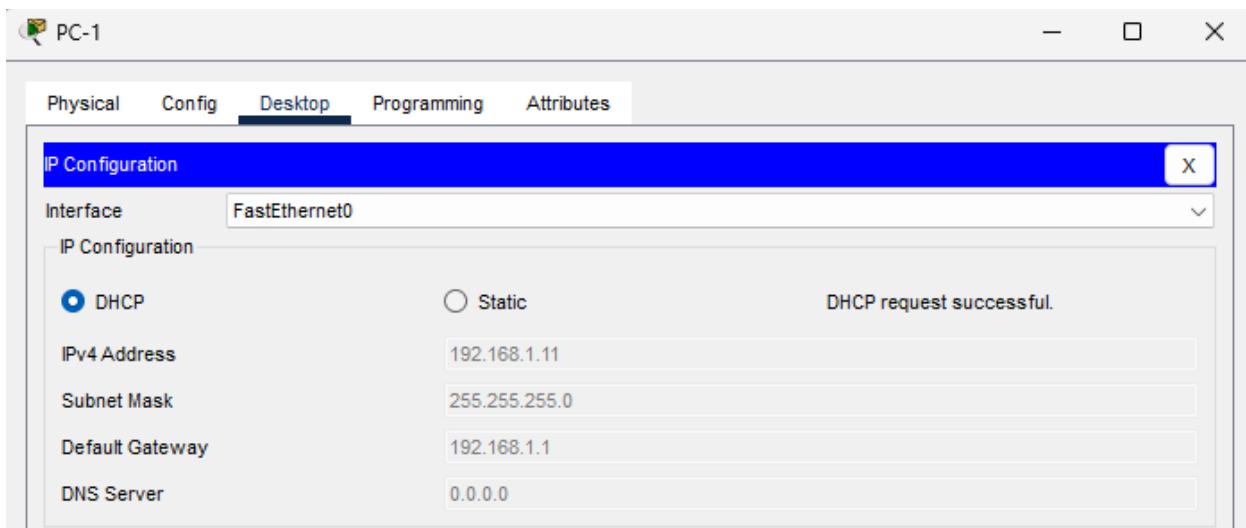
```
ip dhcp pool LAN
```

```
network 192.168.1.0 255.255.255.0
```

```
default-router 192.168.1.1
```

### PC Configuration

- Set IP configuration mode to **DHCP**



- PCs received IP address automatically

## 5. Explanation

Router acts as DHCP server and assigns IP addresses dynamically.

Switch connects all devices and forwards traffic at Layer-2.

## 6. Verification

```
show ip dhcp binding
```

```
ping 192.168.1.1
```

```
Router#show ip dhcp binding
IP address      Client-ID/
               Hardware address
192.168.1.11    0009.7CC0.2090      Lease expiration        Type
192.168.1.12    00E0.F95B.3596      --                      Automatic
Router#ping 192.168.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/13/19 ms
Router#
```

## 7. Common Issues

- Router interface not enabled
- DHCP pool configured with wrong network
- PC not set to DHCP mode

**Note:** DHCP uses DORA stands for,

**1.Discover**

**2.Offer**

**3.Request**

**4.Acknowledge**