# DHCP Service Configuration and Implementation in a LAN Using a Router

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The network comprises a **Cisco 2811 Router**, two **Cisco 2960 Switches**, and multiple PCs.The router has two FastEthernet interfaces:

-   **FastEthernet0/1**: 192.168.16.1/24 (connected to Switch 1)
-   **FastEthernet0/0**: 192.168.15.1/24 (connected to Switch 2)

The router is configured as a **DHCP server** to allocate IP addresses to the connected devices.
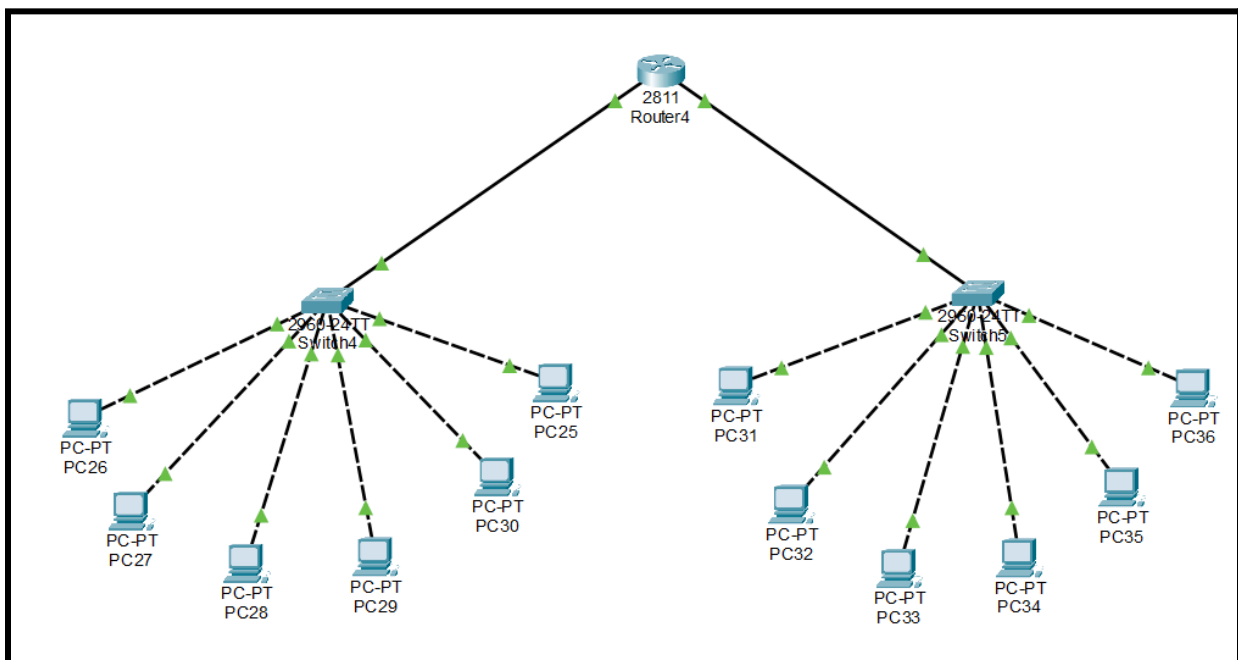
1. DHCP Configuration

-   **DHCP Pool for 192.168.16.0/24**:
    -   network 192.168.16.10 255.255.255.0
    -   default-router 192.168.16.1
    -   DNS-server 8.8.8.8
    -   Successfully assigns IPs to devices connected to **Switch 1**.

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```
Router#enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool LAN
Router(dhcp-config)#network 192.168.16.10 255.255.255.0
Router(dhcp-config)#default-router 192.168.16.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

- **DHCP Pool for 192.168.16.0/24**:
    - network 192.168.15.10 255.255.255.0
    - default-router 192.168.16.1
    - DNS-server 8.8.8.8
    - Successfully assigns IPs to devices connected to **Switch 2**.

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 192.168.16.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no ip address
Router(config-if)#ip address 192.168.15.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

2. Router Interface Configuration

- **FastEthernet0/1:**
  - IP address 192.168.16.1 255.255.255.0
  - Connected to Switch 1

Port Status		On ☑
Bandwidth	◉ 100 Mbps ◯ 10 Mbps	☑ Auto
Duplex	◯ Half Duplex ◉ Full Duplex	☑ Auto
MAC Address	0009.7C5E.4B02	

IP Configuration	
IPv4 Address	192.168.16.1
Subnet Mask	255.255.255.0

Tx Ring Limit	10

- **FastEthernet0/0:**
  - IP address 192.168.15.1 255.255.255.0
  - Connected to Switch 2

Port Status		On ☑
Bandwidth	◉ 100 Mbps ◯ 10 Mbps	☑ Auto
Duplex	◯ Half Duplex ◉ Full Duplex	☑ Auto
MAC Address	0009.7C5E.4B01	

IP Configuration	
IPv4 Address	192.168.15.1
Subnet Mask	255.255.255.0

Tx Ring Limit	10

3. Device IP Assignments (From DHCP)

- PC connected to **Switch 1**:
  - IP: 192.168.15.2
  - Gateway: 192.168.15.1

IP Configuration

Interface	FastEthernet0	⌄

IP Configuration

● DHCP	○ Static	DHCP request successful.
IPv4 Address	192.168.15.2	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.15.1	
DNS Server	8.8.8.8	

IPv6 Configuration

○ Automatic   ● Static

4. Device IP Assignments (From DHCP)

- PC connected to **Switch 2**:
  - IP: 192.168.16.2
  - Gateway: 192.168.16.1

IP Configuration

Interface	FastEthernet0	⌄

IP Configuration

● DHCP	○ Static	DHCP request successful.
IPv4 Address	192.168.16.2	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.16.1	
DNS Server	8.8.8.8	

5. Connection Success Report

- **ICMP Ping Test Results:**
  - **PC26 to PC36:** Successful (0.000 sec)
  - **PC28 to PC31:** Successful (0.000 sec)
  - **PC35 to PC26:** Successful (0.000 sec)
- All tested connections responded successfully, indicating functional communication between devices.

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Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC26	PC36	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC28	PC31	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC35	PC26	ICMP		0.000	N	2	(edit)	(delete)

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