**Exercise: Configuring a Router to Connect Two Networks**

**Objectives:**

In this exercise, you will **learn how to use a router** in Cisco Packet Tracer by connecting **two separate networks**. You will:

* Add a **router** and configure its **interfaces**.
* Set up **default gateways** on PCs.
* Test connectivity between the **192.168.1.0 and 172.16.1.0 networks**.

**Part 1: Setting Up the Network**

**Step 1: Open the Provided File**

1. Open **Cisco Packet Tracer**.
2. Load the file: **"Router in Cisco Packet Tracer.pkt"**.

**Step 2: Add and Connect a Router**

1. **Add a Router (Model: 1941)** from *Network Devices > Routers*.
2. **Remove the existing network connection** between the two switches.
3. **Connect the Router and Switches** using **Copper Straight-Through Cables**:
   * **Switch0 (Left)** **GE 0/1** → **Router GE 0/0**
   * **Switch1 (Right)** **GE 0/1** → **Router GE 0/1**

**Part 2: Configuring the Router**

**Step 3: Assign IP Addresses to Router Interfaces**

1. Click **Router0**, go to the **Config** tab.
2. Configure the following settings in the **INTERFACE** section:

| **Interface** | **Port Status** | **IPv4 Address** | **Subnet Mask** |
| --- | --- | --- | --- |
| **GigabitEthernet0/0** | ON | 192.168.1.1 | 255.255.255.0 |
| **GigabitEthernet0/1** | ON | 172.16.1.1 | 255.255.0.0 |

1. Click **Save**.

**Part 3: Configuring the PCs**

**Step 4: Assign IP Addresses and Default Gateways**

1. Click **each PC**, go to the **Config** tab.
2. Set the **Default Gateway** under **GLOBAL Settings**.
3. Configure the **IP Address and Subnet Mask** in the **INTERFACE - FastEthernet0** section.

| **Device** | **Default Gateway** | **IPv4 Address** | **Subnet Mask** |
| --- | --- | --- | --- |
| **PC0** | 192.168.1.1 | 192.168.1.10 | 255.255.255.0 |
| **PC1** | 192.168.1.1 | 192.168.1.11 | 255.255.255.0 |
| **PC4** | 192.168.1.1 | 192.168.1.12 | 255.255.255.0 |
| **PC2** | 172.16.1.1 | 172.16.1.10 | 255.255.0.0 |
| **PC3** | 172.16.1.1 | 172.16.1.11 | 255.255.0.0 |

**Part 4: Testing Network Connectivity**

**Step 5: Verify Connection Using Ping**

**Test 1: Ping from PC0 to PC2**

1. Click **PC0**, go to **Desktop > Command Prompt**.
2. Run the command: ping 172.16.1.10

**Test 2: Ping from PC3 to PC1**

1. Click **PC3**, go to **Desktop > Command Prompt**.
2. Run the command: ping 192.168.1.12

**Part 5: Configure DHCP servers**

**Step 7: Add 2 servers**

1. Add 2 servers from *End Devices > End Devices > Server*.  
   Place one server0 on the right side of the router, and the other server1 on the left side of the router.
2. Connect the serves and Switches using Copper Straight-Through Cables:
   * Switch0 (Left) FE any → Server (Left) FE0
   * Switch1 (Right) FE any → Server (Right) FE0
3. Configure the **IP Address and Subnet Mask** in the **INTERFACE - FastEthernet0** section.

| **Device** | **Default Gateway** | **IPv4 Address** | **Subnet Mask** |
| --- | --- | --- | --- |
| **Server0(Right)** | 172.16.1.1 | 172.16.1.5 | 255.255.0.0 |
| **Server1(Left)** | 192.168.1.1 | 192.168.1.5 | 255.255.255.0 |

**Step 8: Configure DHCP server**

1. Select Server - Services – DHCP
2. Configure DHCP service of each server as below.
3. Save

| **Device** | **Service** | **Default Gateway** | **Start IP Address** | **SubnetMasi** | **Maxun Number of Users** |
| --- | --- | --- | --- | --- | --- |
| **Server0(Right)** | On | 172.16.1.1 | 172.16.1.20 | 255.255.0.0 | 50 |
| **Server1(Left)** | On | 192.168.1.1 | 192.168.1.20 | 255.255.255.0 | 50 |

**Step 9: Change PCs’ IP configuration from Static to DHCP**

1. Select PC - Config – Settings.
2. Gateway/DNS Ipv4: Change from Static to DHCP.
3. Observe how the IP addresses are assigned.
4. Select PC Config – FastEthernet0
5. IP configuration: Change from Static to DHCP
6. Change the DHCP settings and observe how the IP addresses are assigned.

| **Device** | **Default Gateway** | **IPv4 Address** | **Subnet Mask** |
| --- | --- | --- | --- |
| **PC0** |  |  |  |
| **PC1** |  |  |  |
| **PC4** |  |  |  |
| **PC2** |  |  |  |
| **PC3** |  |  |  |

**Close the Packet Tracer**