

Certainly! Here's a detailed lab report for "3 Router Static Routing Between Two PCs" in Cisco Packet Tracer, using the GUI (without CLI commands).

Title:

Static Routing Between Two PCs via Three Routers in Cisco Packet Tracer (GUI Method)

Objective:

To configure static routing between two PCs located in different networks, connected through three routers, and verify the network connectivity by pinging between the two PCs using the GUI in Cisco Packet Tracer.

Equipment:

- Cisco Packet Tracer software
- 2 PCs (PC1 and PC2)
- 3 Routers
- 2 Switches
- 4 Straight-through Ethernet cables
- 2 Serial DCE cables (to connect the routers)

Theory:

In static routing, network routes are manually added to each router, allowing them to forward packets between devices in different networks. In this scenario, we will set up three routers, with two PCs connected at either end of the network. Static routing will be configured on each router so that they know how to reach the remote networks via the intermediate routers.

For example, PC1 in **Network 1** (192.168.1.0/24) communicates with PC2 in **Network 3** (192.168.3.0/24) by passing through **Router1**, **Router2**, and **Router3**. Static routes must be configured so that each router knows the correct path to forward data to the other networks.

Procedure:**1. Setup the Devices:**

- **Open Cisco Packet Tracer** and start a new project.
- **Add Two PCs (PC1 and PC2):**
 - From the **End Devices** section, drag and drop two **PCs** into the workspace. Label them as **PC1** and **PC2**.

- **Add Three Routers (Router1, Router2, and Router3):**
 - From the **Network Devices** section, choose **Routers** and place three routers into the workspace, labeled as **Router1**, **Router2**, and **Router3**.
 - **Add Two Switches:**
 - From the **Switches** section, drag and drop two switches into the workspace to connect the PCs to the routers.
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2. Connect the Devices:

PC1 to Router1 (via Switch1):

- Use a **Straight-through Ethernet cable** to connect **PC1's FastEthernet0** port to **Switch1's FastEthernet1/1** port.
- Then, connect **Switch1's FastEthernet0/1** port to **Router1's GigabitEthernet0/0** interface.

PC2 to Router3 (via Switch2):

- Use another **Straight-through Ethernet cable** to connect **PC2's FastEthernet0** port to **Switch2's FastEthernet1/1** port.
- Then, connect **Switch2's FastEthernet0/1** port to **Router3's GigabitEthernet0/0** interface.

Router1 to Router2 (Serial Connection):

- Use a **Serial DCE cable** to connect **Router1's Serial0/0/0** to **Router2's Serial0/0/0** port.

Router2 to Router3 (Serial Connection):

- Use another **Serial DCE cable** to connect **Router2's Serial0/0/1** to **Router3's Serial0/0/0** port.
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3. Configure the IP Addresses:

PC1 and PC2 Configuration:

- **PC1:**
 - Click on **PC1**, go to the **Desktop** tab, and open **IP Configuration**.
 - Assign the following settings:
 - * IP Address: **192.168.1.2**
 - * Subnet Mask: **255.255.255.0**
 - * Default Gateway: **192.168.1.1** (Router1's LAN interface).

- **PC2:**
 - Click on **PC2**, go to the **Desktop** tab, and open **IP Configuration**.
 - Assign the following settings:
 - * IP Address: **192.168.3.2**
 - * Subnet Mask: **255.255.255.0**
 - * Default Gateway: **192.168.3.1** (Router3's LAN interface).

Router1 Configuration:

- Click on **Router1**, then go to the **Config** tab.
- **Configure LAN (GigabitEthernet0/0):**
 - Select **GigabitEthernet0/0**, and assign:
 - * IP Address: **192.168.1.1**
 - * Subnet Mask: **255.255.255.0**
 - * Turn **On** the interface.
- **Configure WAN (Serial0/0/0):**
 - Select **Serial0/0/0**, and assign:
 - * IP Address: **10.0.0.1**
 - * Subnet Mask: **255.255.255.252** (for point-to-point communication).
 - * Set **Clock Rate** to **64000** (since it's the DCE side).
 - * Turn **On** the interface.

Router2 Configuration:

- Click on **Router2**, then go to the **Config** tab.
- **Configure WAN (Serial0/0/0)** (connection to Router1):
 - Select **Serial0/0/0**, and assign:
 - * IP Address: **10.0.0.2**
 - * Subnet Mask: **255.255.255.252**.
 - * Turn **On** the interface.
- **Configure WAN (Serial0/0/1)** (connection to Router3):
 - Select **Serial0/0/1**, and assign:
 - * IP Address: **10.0.1.1**
 - * Subnet Mask: **255.255.255.252**.
 - * Turn **On** the interface.

Router3 Configuration:

- Click on **Router3**, then go to the **Config** tab.
- **Configure WAN (Serial0/0/0):**
 - Select **Serial0/0/0**, and assign:
 - * IP Address: **10.0.1.2**
 - * Subnet Mask: **255.255.255.252**.
 - * Turn **On** the interface.
- **Configure LAN (GigabitEthernet0/0):**
 - Select **GigabitEthernet0/0**, and assign:

- * IP Address: **192.168.3.1**
 - * Subnet Mask: **255.255.255.0**.
 - * Turn **On** the interface.
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4. Configure Static Routing (Using GUI):

Router1 Static Route:

- Click on **Router1**, go to the **Config** tab, and select **Static** under the **Routing** section.
- Add a new static route:
 - **Network Address: 192.168.3.0** (PC2's network).
 - **Subnet Mask: 255.255.255.0**.
 - **Next Hop: 10.0.0.2** (Router2's Serial0/0/0 IP address).
 - Click **Add**.

Router2 Static Routes:

- Click on **Router2**, go to the **Config** tab, and select **Static** under the **Routing** section.
- Add the following static routes:
 - **To Network 192.168.1.0/24 (PC1's network):**
 - * **Network Address: 192.168.1.0**
 - * **Subnet Mask: 255.255.255.0**
 - * **Next Hop: 10.0.0.1** (Router1's Serial0/0/0 IP address).
 - * Click **Add**.
 - **To Network 192.168.3.0/24 (PC2's network):**
 - * **Network Address: 192.168.3.0**
 - * **Subnet Mask: 255.255.255.0**
 - * **Next Hop: 10.0.1.2** (Router3's Serial0/0/0 IP address).
 - * Click **Add**.

Router3 Static Route:

- Click on **Router3**, go to the **Config** tab, and select **Static** under the **Routing** section.
 - Add a new static route:
 - **Network Address: 192.168.1.0** (PC1's network).
 - **Subnet Mask: 255.255.255.0**.
 - **Next Hop: 10.0.1.1** (Router2's Serial0/0/1 IP address).
 - Click **Add**.
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5. Test the Network Connection:

- On **PC1**, open the **Command Prompt** from the **Desktop** tab.

- Type the command: `ping 192.168.3.2` (PC2's IP address).
 - Observe if the ICMP packets are successfully received by PC2.
 - On **PC2**, open the **Command Prompt** and type `ping 192.168.1.2` (PC1's IP address).
 - Verify if PC1 receives replies from PC2.
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Results:

- After configuring static routing on all three routers, the ping command from **PC1 (192.168.1.2)** to **PC2 (192.168.3.2)** was successful.
 - Similarly, the ping from **PC2** to **PC1** also succeeded, confirming proper communication between the two devices.
 - The static routing configuration allowed each router to correctly forward data between networks based on manually added routes.
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Conclusion:

In this lab, we successfully established communication between two PCs located in different networks via three routers using static routing. The static routes were configured using the GUI in Cisco Packet Tracer, ensuring each router knew the paths to the other networks. The successful ping tests between PC1 and PC2 verified that the routers were able to route the packets correctly through the configured paths. Static routing is an essential technique for managing traffic in small or controlled network environments.

Let me know if you need further clarification or additional details!