Sure! Here's a detailed lab report for "Triangular Static Routing Between PCs" in Cisco Packet Tracer, using the GUI (without CLI commands):

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**Title:**

Triangular Static Routing Between PCs in Cisco Packet Tracer (GUI Method)

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**Objective:**

To establish static routing between three PCs arranged in a triangular topology using three routers and verify connectivity by pinging between the PCs using Cisco Packet Tracer's GUI.

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**Equipment:**

- Cisco Packet Tracer software

- 3 PCs (PC1, PC2, PC3)

- 3 Routers (Router1, Router2, Router3)

- 3 Switches (Switch1, Switch2, Switch3)

- 6 Straight-through Ethernet cables

- 3 Serial DCE cables (for router-to-router connections)

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**Theory:**

In a triangular static routing topology, three routers are connected in a triangle, each having a separate network connected to a PC. Static routing is used to allow communication between the PCs across the different networks.

Static routing involves manually adding routes to the routers' routing tables, specifying the path to reach remote networks. Each router will need a static route for the two other networks, allowing them to forward packets correctly.

In this setup, the PCs are located in three different networks: - PC1 (Network 1: 192.168.1.0/24) - PC2 (Network 2: 192.168.2.0/24) - PC3 (Network 3: 192.168.3.0/24)

Each router will need two static routes to the other two networks.

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**Procedure:**

**1. Set Up the Devices:**

- **Open Cisco Packet Tracer** and create a new project.

- **Add 3 PCs (PC1, PC2, and PC3):**
  - From the **End Devices** section, drag and drop three PCs into the workspace.
  - Label them as **PC1**, **PC2**, and **PC3**.

- **Add 3 Routers (Router1, Router2, Router3):**
  - From the **Network Devices** section, choose **Routers** and place three routers into the workspace, labeling them **Router1**, **Router2**, and **Router3**.

- **Add 3 Switches (Switch1, Switch2, and Switch3):**
  - From the **Switches** section, drag and drop three switches into the workspace. Label them as **Switch1**, **Switch2**, and **Switch3**.

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**2. Connect the Devices:**

**PC1, PC2, and PC3 to Routers (via Switches):**

- Use **Straight-through Ethernet cables** to connect each PC to its respective switch and router:
  - **PC1 → Switch1 → Router1 (GigabitEthernet0/0)**
  - **PC2 → Switch2 → Router2 (GigabitEthernet0/0)**
  - **PC3 → Switch3 → Router3 (GigabitEthernet0/0)**

**Router Connections (Triangle Topology):**

- Use **Serial DCE cables** to connect the routers in a triangular fashion:
  - **Router1 (Serial0/0/0) → Router2 (Serial0/0/0)**
  - **Router2 (Serial0/0/1) → Router3 (Serial0/0/0)**
  - **Router3 (Serial0/0/1) → Router1 (Serial0/0/1)**

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**3. Configure IP Addresses:**

**PC1, PC2, and PC3 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: **192.168.2.2**
        * Subnet Mask: **255.255.255.0**
        * Default Gateway: **192.168.2.1** (Router2's LAN interface).
- **PC3:**
    - Click on **PC3**, 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).

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**4. Router Configuration:**

**Router1 Configuration:**

- **GigabitEthernet0/0 (LAN):**
    - Click on **Router1**, go to the **Config** tab, and select **GigabitEthernet0/0**.
    - Set the **IP Address** to **192.168.1.1** with a **Subnet Mask** of **255.255.255.0**.
    - Turn **On** the interface.
- **Serial0/0/0 (WAN to Router2):**
    - Go to **Serial0/0/0**.
    - Set the **IP Address** to **10.0.0.1** with a **Subnet Mask** of **255.255.255.252**.
    - Set **Clock Rate** to **64000** (since Router1 is the DCE side).
    - Turn **On** the interface.
- **Serial0/0/1 (WAN to Router3):**
    - Go to **Serial0/0/1**.
    - Set the **IP Address** to **10.0.1.1** with a **Subnet Mask** of **255.255.255.252**.
    - Turn **On** the interface.

**Router2 Configuration:**

- **GigabitEthernet0/0 (LAN):**
    - Click on **Router2**, go to the **Config** tab, and select **GigabitEthernet0/0**.

- Set the **IP Address** to **192.168.2.1** with a **Subnet Mask** of **255.255.255.0**.
  - Turn **On** the interface.
- **Serial0/0/0 (WAN to Router1):**
  - Go to **Serial0/0/0**.
  - Set the **IP Address** to **10.0.0.2** with a **Subnet Mask** of **255.255.255.252**.
  - Turn **On** the interface.
- **Serial0/0/1 (WAN to Router3):**
  - Go to **Serial0/0/1**.
  - Set the **IP Address** to **10.0.2.1** with a **Subnet Mask** of **255.255.255.252**.
  - Turn **On** the interface.

**Router3 Configuration:**

- **GigabitEthernet0/0 (LAN):**
  - Click on **Router3**, go to the **Config** tab, and select **GigabitEthernet0/0**.
  - Set the **IP Address** to **192.168.3.1** with a **Subnet Mask** of **255.255.255.0**.
  - Turn **On** the interface.
- **Serial0/0/0 (WAN to Router2):**
  - Go to **Serial0/0/0**.
  - Set the **IP Address** to **10.0.2.2** with a **Subnet Mask** of **255.255.255.252**.
  - Turn **On** the interface.
- **Serial0/0/1 (WAN to Router1):**
  - Go to **Serial0/0/1**.
  - Set the **IP Address** to **10.0.1.2** with a **Subnet Mask** of **255.255.255.252**.
  - Turn **On** the interface.

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**5. Configure Static Routing (Using GUI):**

**Router1 Static Routes:**

- Go to **Router1**, open the **Config** tab, and select **Static** under the **Routing** section.
- Add two static routes:
  - **To Network 192.168.2.0/24 (PC2's network):**
    * **Network Address: 192.168.2.0**
    * **Subnet Mask: 255.255.255.0**
    * **Next Hop: 10.0.0.2** (Router2's Serial0/0/0 IP address).
  - **To Network 192.168.3.0/24 (PC3's network):**

- \* **Network Address: 192.168.3.0**
- \* **Subnet Mask: 255.255.255.0**
- \* **Next Hop: 10.0.1.2** (Router3's Serial0/0/1 IP address).

**Router2 Static Routes:**

- Go to **Router2**, open

the **Config** tab, and select **Static** under the **Routing** section. - Add two 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). - **To Network 192.168.3.0/24 (PC3's network):** - **Network Address: 192.168.3.0** - **Subnet Mask: 255.255.255.0** - **Next Hop: 10.0.2.2** (Router3's Serial0/0/1 IP address).

**Router3 Static Routes:**

- Go to **Router3**, open the **Config** tab, and select **Static** under the **Routing** section.
- Add two 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: 10.0.1.1** (Router1's Serial0/0/1 IP address).
  - **To Network 192.168.2.0/24 (PC2's network):**
    - \* **Network Address: 192.168.2.0**
    - \* **Subnet Mask: 255.255.255.0**
    - \* **Next Hop: 10.0.2.1** (Router2's Serial0/0/1 IP address).

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6. **Test the Network:**

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

- Type the command: `ping 192.168.2.2` (PC2's IP) and `ping 192.168.3.2` (PC3's IP).

- Ensure successful communication.

- Similarly, test the connection from **PC2** and **PC3** by pinging **PC1** and the other PC.

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**Results:**

- The ping between **PC1**, **PC2**, and **PC3** was successful, confirming that the routers correctly routed packets using the static routes.

- Each router successfully forwarded packets to the correct networks based on the manually configured routes.

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**Conclusion:**

In this lab, we configured static routing between three PCs connected through three routers in a triangular topology. Static routes were manually set up using the GUI, allowing the routers to forward packets to the correct destination. The successful ping results between the PCs validated the proper routing configuration, demonstrating how static routing works in a triangular network setup.

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