**Aim**

The aim of this experiment is to **design, implement, and configure a basic hierarchical network topology** using Cisco Packet Tracer, specifically utilizing **one router, two switches, and multiple PCs**, to demonstrate **successful communication** between hosts located in **different network segments (subnets)**, which requires the router for connectivity.

**Algorithm**

This algorithm outlines the steps to build two separate Local Area Networks (LANs) and connect them using a single router.

**1. Physical Topology Setup**

* **Place Devices:** Add **1 Router** (e.g., 2911 or 1941), **2 Switches** (e.g., 2960), and **two or more PCs** per switch (e.g., 2 PCs for Switch 1 and 2 PCs for Switch 2).
* **Cabling:**
  + Connect the **PCs to the Switches** using **Copper Straight-Through** cables.
  + Connect **Switch 1 to Router Interface 1** (e.g., Gig0/0/0) using a Straight-Through cable.
  + Connect **Switch 2 to Router Interface 2** (e.g., Gig0/0/1) using a Straight-Through cable.

**2. IP Addressing Scheme**

* **Define Networks:** Assign two distinct network IDs (e.g., for LAN 1 and for LAN 2).

| Device | Interface | IP Address | Subnet Mask | Default Gateway | Network Segment |
| --- | --- | --- | --- | --- | --- |
| **Router** | Gig0/0/0 (LAN 1) |  |  | N/A | LAN 1 |
| **Router** | Gig0/0/1 (LAN 2) |  |  | N/A | LAN 2 |
| **PC on Switch 1** | FastEthernet0 |  |  |  | LAN 1 |
| **PC on Switch 2** | FastEthernet0 |  |  |  | LAN 2 |

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**3. Device Configuration**

* **Router:**
  1. Access the CLI, enter Global Configuration mode (conf t).
  2. Configure Interface Gig0/0/0 with IP and activate it (no shutdown).
  3. Configure Interface Gig0/0/1 with IP and activate it (no shutdown).
* **PCs:**
  1. On each PC, go to **Desktop > IP Configuration**.
  2. Set the **Static IP Address, Subnet Mask, and Default Gateway** according to the table above.
* **Switches:** (Switches are largely plug-and-play for basic LAN segments and require no specific configuration for this basic inter-LAN routing experiment).

**Result**

The experiment is successful when network connectivity is verified across the different segments.

