**AIM**:

To configure VLANs on a switch and router in Cisco Packet Tracer to enable communication between devices in different VLANs through inter-VLAN routing.

**PROCEDURE:**

**Step 1: Set Up the Devices**

* Place the **Router**, **Switch**, and **PCs** in the workspace.
* Connect the **Router to the Switch** using a cross-over cable from **Router FastEthernet0/0** to **Switch FastEthernet0/20**.
* Connect each **PC to the Switch**:
  + PC1 and PC2 will be in VLAN 10 (connect to any ports like Fa0/1 and Fa0/2).
  + PC3 and PC4 will be in VLAN 20 (connect to any ports like Fa0/3 and Fa0/4).

**Step 2: Configure VLANs on the Switch**

1. **Access the Switch CLI:**
   * Click on the switch, go to the **CLI** tab.
2. **Enter Configuration Mode:**

config# enable

config# configure terminal

1. **Create VLANs:**
   * **VLAN 10:**

config# vlan 10

config# name VLAN10

config# exit

* + **VLAN 20:**

config# vlan 20

config# name VLAN20

config# exit

1. **Assign Ports to VLANs:**
   * For **VLAN 10 (PC1 and PC2)**:

config# interface FastEthernet0/1

config# switchport mode access

config# switchport access vlan 10

config# exit

config# interface FastEthernet0/2

config# switchport mode access

config# switchport access vlan 10

config# exit

* + For **VLAN 20 (PC3 and PC4)**:

config# interface FastEthernet0/3

config# switchport mode access

config# switchport access vlan 20

config# exit

config# interface FastEthernet0/4

config# switchport mode access

config# switchport access vlan 20

config# exit

1. **Configure the Trunk Port:**
   * Set the port connected to the router as a trunk port (e.g., FastEthernet0/20).

config# interface FastEthernet0/20

config# switchport mode trunk

config# exit

**Step 3: Configure the Router for Inter-VLAN Routing**

1. **Access the Router CLI:**
   * Click on the router, go to the **CLI** tab.
2. **Enter Configuration Mode:**

config# enable

config# configure terminal

1. **Configure Subinterfaces for Each VLAN:**
   * **Subinterface for VLAN 10:**

config# interface FastEthernet0/0.10

config# encapsulation dot1Q 10

config# ip address 192.168.1.100 255.255.255.0

config# exit

* + **Subinterface for VLAN 20:**

config# interface FastEthernet0/0.20

config# encapsulation dot1Q 20

config# ip address 192.168.2.100 255.255.255.0

config# exit

1. **Enable the Main Interface:**
   * Make sure the main interface **FastEthernet0/0** is up.

config# interface FastEthernet0/0

config# no shutdown

config# exit

**Step 4: Configure IP Addresses on PCs**

* For **PC1 (VLAN 10)**:
  + IP Address: 192.168.1.1
  + Subnet Mask: 255.255.255.0
  + Default Gateway: 192.168.1.100
* For **PC2 (VLAN 10)**:
  + IP Address: 192.168.1.2
  + Subnet Mask: 255.255.255.0
  + Default Gateway: 192.168.1.100
* For **PC3 (VLAN 20)**:
  + IP Address: 192.168.2.1
  + Subnet Mask: 255.255.255.0
  + Default Gateway: 192.168.2.100
* For **PC4 (VLAN 20)**:
  + IP Address: 192.168.2.2
  + Subnet Mask: 255.255.255.0
  + Default Gateway: 192.168.2.100

**Step 5: Test Connectivity**

* **Ping** from PC1 to PC2 within VLAN 10 (should succeed).
* **Ping** from PC3 to PC4 within VLAN 20 (should succeed).
* **Ping** between PCs in different VLANs (e.g., PC1 to PC3) to verify inter-VLAN routing (should also succeed).

DIAGRAM:

A computer network diagram with a few computers connected to it

Description automatically generated

RESULT:

Thus the configuration of VLAN is successfully done and the ping from one PC to other PCs is verified.