Lab 3: Configuring a Router for Inter-VLAN Routing

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Aim: Configure a router to handle traffic between different VLANs for inter-VLAN communication.

Objectives:

1. Set up VLANs on a switch.
2. Configure router interfaces for each VLAN.
3. Test inter-VLAN communication.

Steps:

1. **Open Cisco Packet Tracer:** ○ Start a new project.
2. **Add Devices:**
    - **Add a Router:** Drag a router (e.g., 2911) to the workspace.
    - **Add a Switch:** Drag a switch (e.g., 2960).
    - **Add PCs:** Drag multiple PCs and connect them to the switch.
3. **Configure VLANs on the Switch:**

Access the switch CLI and create VLANs:

```
Switch> enable
Switch# configure terminal
Switch(config)# vlan 10
Switch(config-vlan)# name Sales
Switch(config-vlan)# exit
Switch(config)# vlan 20
Switch(config-vlan)# name HR
Switch(config-vlan)# exit
```

Assign switch ports to VLANs:

```
Switch(config)# interface range fa0/1 - 2
Switch(config-if-range)# switchport mode access
Switch(config-if-range)# switchport access vlan 10
Switch(config)# interface range fa0/3 - 4
Switch(config-if-range)# switchport mode access
Switch(config-if-range)# switchport access vlan 20
```

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4. **Configure Router for Inter-VLAN Routing:**

Configure sub-interfaces on the router:

```
Router> enable
Router# configure terminal
Router(config)# interface gig0/1.10
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.10.1 255.255.255.0
Router(config-subif)# exit
Router(config)# interface gig0/1.20
Router(config-subif)# encapsulation dot1Q 20
Router(config-subif)# ip address 192.168.20.1 255.255.255.0
Router(config-subif)# exit
```

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5. **Test Inter-VLAN Communication:**
    - Assign IP addresses to PCs in VLAN 10 and VLAN 20.
    - Use the ping command to test connectivity between PCs in different VLANs.