Packet Tracer - Configure Router-on-a-Stick Inter-VLAN Routing

Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway
R1	G0/0.10	172.17.10.1	255.255.255.0	N/A
	G0/0.30	172.17.30.1	255.255.255.0	N/A
PC1	NIC	172.17.10.10	255.255.255.0	172.17.10.1
PC3	NIC	172.17.30.10	255.255.255.0	172.17.30.1

Objectives

Part 1: Add VLANs to a Switch

Part 2: Configure Subinterfaces

Part 3: Test Connectivity with Inter-VLAN Routing

Scenario

In this activity, you will configure VLANs and inter-VLAN routing. You will then enable trunk interfaces and verify connectivity between VLANs.

Instructions

Part 1: Add VLANs to a Switch

Step 1: Create VLANs on S1.

Create VLAN 10 and VLAN 30 on **S1**.

Step 2: Assign VLANs to ports.

a. Configure interfaces F0/6 and F0/11 as access ports and assign VLANs.

- Assign the port connected to **PC1** to VLAN 10.
- Assign the port connected to **PC3** to VLAN 30.

b. Issue the **show vlan brief** command to verify VLAN configuration.

```
S1# show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/7, Fa0/8, Fa0/9
                                                 Fa0/10, Fa0/12, Fa0/13, Fa0/14
                                                 Fa0/15, Fa0/16, Fa0/17, Fa0/18
```

```
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   VLAN0010                           active    Fa0/11
30   VLAN0030                           active    Fa0/6
1002 fddi-default                       active
1003 token-ring-default                 active
1004 fddinet-default                    active
1005 trnet-default                      active
```

Step 3: Test connectivity between PC1 and PC3.

From **PC1**, ping **PC3**.

Were the pings successful? Why did you get this result?

Part 2: Configure Subinterfaces

Step 1: Configure subinterfaces on R1 using the 802.1Q encapsulation.

a. Create the subinterface G0/0.10.

- Set the encapsulation type to 802.1Q and assign VLAN 10 to the subinterface.
- Refer to the **Address Table** and assign the correct IP address to the subinterface.

```
R1(config)# int g0/0.10
R1(config-subif)# encapsulation dot1Q 10
R1(config-subif)# ip address 172.17.10.1 255.255.255.0
```

b. Repeat for the G0/0.30 subinterface.

Step 2: Verify Configuration.

a. Use the **show ip interface brief** command to verify subinterface configuration. Both subinterfaces are down. Subinterfaces are virtual interfaces that are associated with a physical interface. Therefore, in order to enable subinterfaces, you must enable the physical interface that they are associated with.

b. Enable the G0/0 interface. Verify that the subinterfaces are now active.

Part 3: Test Connectivity with Inter-VLAN Routing

Step 1: Ping between PC1 and PC3.

From **PC1**, ping **PC3**. The pings should still fail. Explain.

Step 2: Enable trunking.

a. On **S1**, issue the **show vlan** command.

What VLAN is G0/1 assigned to?

b. Because the router was configured with multiple subinterfaces assigned to different VLANs, the switch port connecting to the router must be configured as a trunk. Enable trunking on interface G0/1.

How can you determine that the interface is a trunk port using the **show vlan** command?

c. Issue the **show interface trunk** command to verify that the interface is configured as a trunk.

Step 3: Test Connectivity

If the configurations are correct, PC1 and PC3 should be able to ping their default gateways and each other.

What addresses do PC1 and PC3 use as their default gateway addresses?