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 |
| R1 | 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

## Add VLANs to a Switch

### Create VLANs on S1.

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

Open configuration window

### Assign VLANs to ports.

* + - 1. 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.
  + - 1. Issue the **show vlan brief** command to verify VLAN configuration.

S1# **show vlan brief**

VLAN Name Status Ports

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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

Close configuration window

### Test connectivity between PC1 and PC3.

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

#### Question:

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

No, because there is no way for the VLANs to communicate with each other unless we set up routing. In this case, it seems the switch is not a layer 3 switch, so the router will need to handle the routing of VLAN traffic. Subinterfaces on the router must be set up in order for the it to route VLAN traffic.

## Configure Subinterfaces

### Configure subinterfaces on R1 using the 802.1Q encapsulation.

Open configuration window

* + - 1. 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**

* + - 1. Repeat for the G0/0.30 subinterface.

### Verify Configuration.

* + - 1. 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.
      2. Enable the G0/0 interface. Verify that the subinterfaces are now active.

Close configuration window

## Test Connectivity with Inter-VLAN Routing

### Ping between PC1 and PC3.

#### Question:

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

There is no trunk port set up on the switch going to the router

### Enable trunking.

Open configuration window

* + - 1. On **S1**,issue the **show vlan** command.

#### Question:

What VLAN is G0/1 assigned to?

VLAN 1 (default)

* + - 1. 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.

#### Question:

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

The interface should no longer show up in the “show vlan” command, and should instead show up in the “show interface trunk” command.

* + - 1. Issue the **show interface trunk** command to verify that the interface is configured as a trunk.

Close configuration window

### Test Connectivity

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

#### Question:

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

They use the ip address that is assigned to the associated VLAN subinterface.