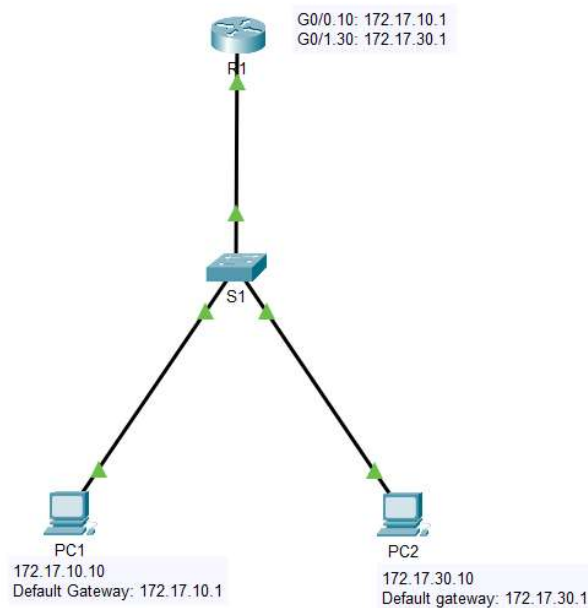


Redes de Computadores - RECOMP – 2023/2024

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

Lab Topology:

The lab network topology is illustrated below:



Objectives

- Part 1: Assign IPs and names
- Part 2: Add VLANs to a Switch
- Part 3: Configure Subinterfaces
- Part 4: Test Connectivity with 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	F0/1	172.17.10.10	255.255.255.0	172.17.10.1
PC2	F0/2	172.17.30.10	255.255.255.0	172.17.30.1

Table 1 – IP Addresses

Scenario

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

Instructions

Part1: Assign IPs and names

Step 1: Assign IP and gateway to PC1 e PC2.

- Statically assign the IP and gateway to PC1 e PC2 with the addresses in Table 1.

Step 2: Assign names

- a) Assign names to the router and switch.

Part 2: Add VLANs to a Switch

Step 1: Create VLANs on S1.

- a) Create VLAN 10 and VLAN 30 on S1.

```
Enter global configuration mode:  
S1#configure terminal  
Enter VLAN configuration mode and/or create a VLAN:  
S1(config)#vlan 10  
Configure a name for the VLAN.  
S1(config-vlan)#name vlan_10
```

Repeat for vlan 30

Step 2: Assign VLANs to ports.

- a) Configure interfaces F0/1 and F0/2 as access ports and assign VLANs.
- Assign the port connected to **PC1** to VLAN 10.

```
S1(config)# interface F0/1  
S1(config-if)#switchport access vlan 10
```

- Assign the port connected to **PC2** to VLAN 30.

```
S1(config)# interface F0/2  
S1(config-if)#switchport access vlan 30
```

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

Step 3: Test connectivity between PC1 and PC2.

From **PC1**, ping **PC2**.

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

Part 3: 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, 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.

```
R1(config)# int G0/0
R1(config-subif)#no shutdown
```

Part 4: Test Connectivity with Inter-VLAN Routing

Step 1: Ping between PC1 and PC2.

From **PC1**, ping **PC2**. 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.

```
S1(config)#interface G0/1
S1(config-if)# switchport mode trunk
```

- d) Test again the connectivity.