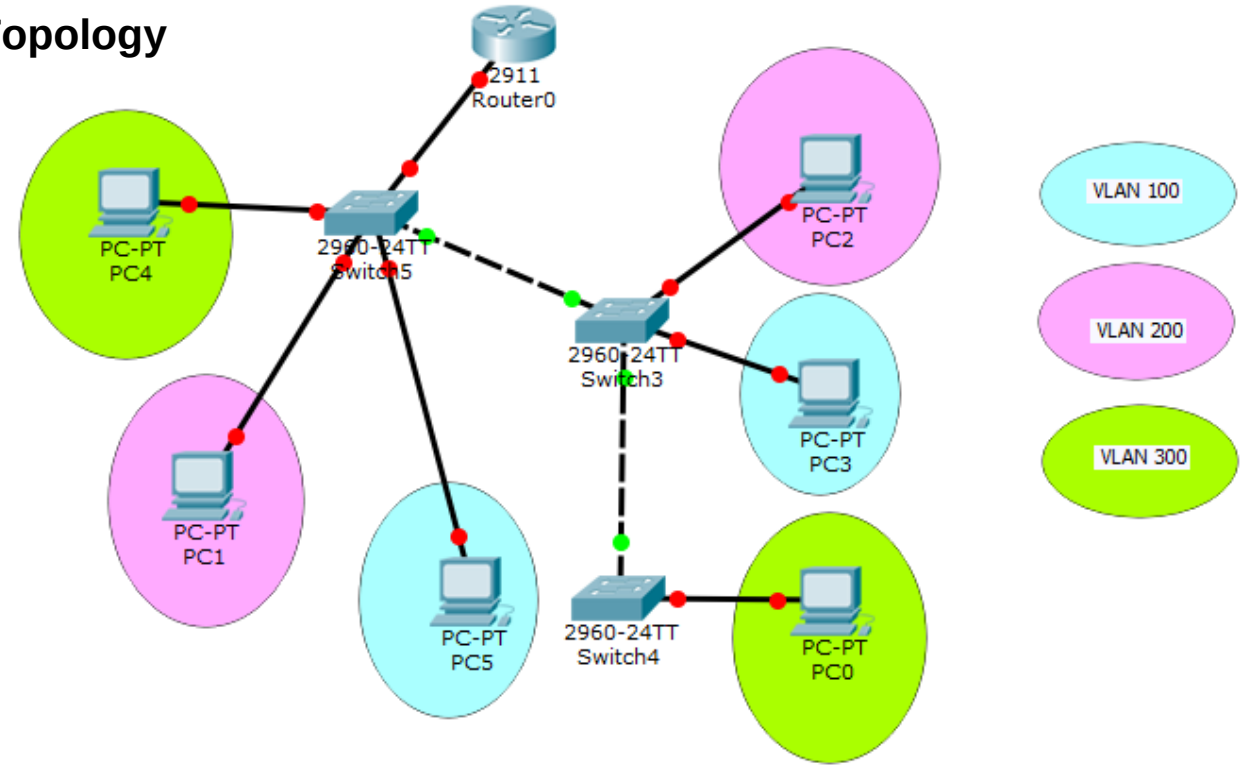
Lab Activity 5.0.0.1 – Configuring Router-on-a-Stick Inter-VLAN Routing Skills Integration

Topology



Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway

Objectives

Part 1: Test Connectivity without Inter-VLAN Routing

Part 2: Add VLANs to a Switch

Part 3: Configure Subinterfaces

Part 4: Test Connectivity with Inter-VLAN Routing

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VLAN and Port Assignments Table

VLAN ID	VLAN NAme	PC Assign	Port Assign

Scenario

In this activity, you will check for connectivity prior to implementing inter-VLAN routing. You will then configure VLANs and inter-VLAN routing. Finally, you will enable trunking and verify connectivity between VLANs.

Part 1: Test Connectivity Without Inter-VLAN Routing

Step 1: Ping between PC1 and PC3.

Wait for switch convergence or click **Fast Forward Time** a few times. When the link lights are green for **PC1** and **PC3**, ping between **PC1** and **PC3**. Because the two PCs are on separate networks and **Company Router** is not configured, the ping fails.

Step 2: Switch to Simulation mode to monitor pings.

a. Switch to Simulation mode by clicking the **Simulation** tab or pressing **Shift+S**.

b. Click **Capture/Forward** to see the steps the ping takes between **PC1** and **PC3**. Notice how the ping never leaves **PC1**.

c. What process failed and why?

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Part 2: Add VLANs to a Switch

Step 1: Create VLANs on Main Switch, 1st Floor Switch and 2nd Floor Switch.

Step 2: Return to Realtime mode and create VLANS on Main Switch, 1st Floor Switch and 2nd Floor Switch.

Step 3: Assign VLANs to ports.

a. Configure interface F0/5, F0/11 and F0/16 as access ports and assigned VLANs.

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

Step 4: Test connectivity between PC1 and PC3.

From **PC1**, ping **PC3**. The pings should still fail. Why were the pings unsuccessful?

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Part 3: Configure Subinterfaces

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

a. Create the subinterface Set the encapsulation type to 802.1Q and assign VLAN 100 to the subinterface.

- Refer to the **Address Table** and assign the correct IP address to the 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 4: Test Connectivity with Inter-VLAN Routing

Step 1: Ping between PC1 and PC3.

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

Step 2: Enable trunking.

a. On **Main Switch**, issue the **show vlan** command. What VLAN is G1/1 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 G1/1.

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

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d. Don't forget to issue trunk between the main switch and the connected switches.

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

Step 3: Switch to Simulation mode to monitor pings.

a. Switch to **Simulation** mode by clicking the **Simulation** tab or pressing **Shift+S**.

b. Click **Capture/Forward** to see the steps the ping takes between **PC1** and **PC3**.

Suggested Scoring Rubric – 60 pts. Good for 45 minutes

1. Topology – 10 pts.
2. VLAN assignment and Configuration – 20 pts.
3. InterVLAN Configuration – 20 pts.
4. Addressing and Connectivity – 10 pts.