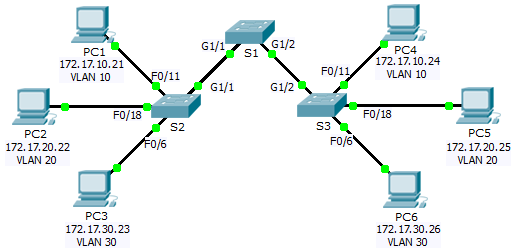
Lab 3a – Packet Tracer – Configuring VLANs (PTA 3.2.1.7)

1. Topology

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Addressing Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Device | Interface | IP Address | Subnet Mask | VLAN |
| PC1 | NIC | 172.17.10.21 | 255.255.255.0 | 10 |
| PC2 | NIC | 172.17.20.22 | 255.255.255.0 | 20 |
| PC3 | NIC | 172.17.30.23 | 255.255.255.0 | 30 |
| PC4 | NIC | 172.17.10.24 | 255.255.255.0 | 10 |
| PC5 | NIC | 172.17.20.25 | 255.255.255.0 | 20 |
| PC6 | NIC | 172.17.30.26 | 255.255.255.0 | 30 |

1. Objectives

Part 1: Verify the Default VLAN Configuration

Part 2: Configure VLANs

Part 3: Assign VLANs to Ports

Background

VLANs are helpful in the administration of logical groups, allowing members of a group to be easily moved, changed, or added. This activity focuses on creating and naming VLANs, and assigning access ports to specific VLANs.

1. View the Default VLAN Configuration
   1. Display the current VLANs.

On S1, issue command to display all VLANs configured. By default, all interfaces are assigned to VLAN 1.

* 1. Verify connectivity between PCs on the same network.

Notice that each PC can ping the other PC that shares the same network.

* PC1 can ping PC4
* PC2 can ping PC5
* PC3 can ping PC6

Pings to PCs in other networks fail.

What benefit will configuring VLANs provide to the current configuration?

All PCs will be able to ping each other.

1. Configure VLANs
   1. Create and name VLANs on S1.

Create the following VLANs. Names are case-sensitive:

* VLAN 10: Faculty/Staff
* VLAN 20: Students
* VLAN 30: Guest(Default)
* VLAN 99: Management&Native
  1. Verify the VLAN configuration.

Which command will only display the VLAN name, status, and associated ports on a switch?

S1#show vlan

* 1. Create the VLANs on S2 and S3.

Using the same commands from Step 1, create and name the same VLANs on S2 and S3.

* 1. Verify the VLAN configuration.

1. Assign VLANs to Ports
   1. Assign VLANs to the active ports on S2.

Assign the VLANs to the following ports:

* VLAN 10: Fast Ethernet 0/11
* VLAN 20: Fast Ethernet 0/18
* VLAN 30: Fast Ethernet 0/6
  1. Assign VLANs to the active ports on S3.

S3 uses the same VLAN access port assignments as S2.

* 1. Verify loss of connectivity.

Previously, PCs that shared the same network could ping each other successfully. Try pinging between PC1 and PC4. Although the access ports are assigned to the appropriate VLANs, were the pings successful? Why?

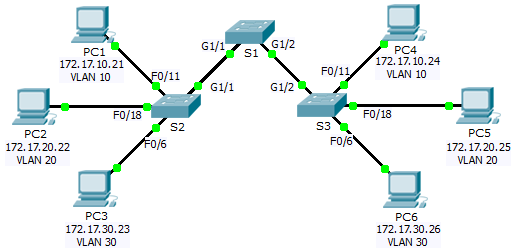
Pings were unsuccessful because the ports connecting the switches are assigned to VLAN 1 by default.

What could be done to resolve this issue?

Trunks must be configured.

Lab 3b – Packet Tracer – Configuring Trunks (PTA 3.2.2.4)

1. Topology



1. Addressing Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Device | Interface | IP Address | Subnet Mask | Switch Port | VLAN |
| PC1 | NIC | 172.17.10.21 | 255.255.255.0 | S1 F0/11 | 10 |
| PC2 | NIC | 172.17.20.22 | 255.255.255.0 | S1 F0/18 | 20 |
| PC3 | NIC | 172.17.30.23 | 255.255.255.0 | S1 F0/6 | 30 |
| PC4 | NIC | 172.17.10.24 | 255.255.255.0 | S2 F0/11 | 10 |
| PC5 | NIC | 172.17.20.25 | 255.255.255.0 | S2 F0/18 | 20 |
| PC6 | NIC | 172.17.30.26 | 255.255.255.0 | S2 F0/6 | 30 |

1. Objectives

Part 1: Verify VLANs

Part 2: Configure Trunks

1. Background

Trunks are required to pass VLAN information between switches. A port on a switch is either an access port or a trunk port. Access ports carry traffic from a specific VLAN assigned to the port. A trunk port by default is a member of all VLANs; therefore, it carries traffic for all VLANs. This activity focuses on creating trunk ports, and assigning them to a native VLAN other than the default.

1. Verify VLANs
   1. Display the current VLANs.
      1. On **S1**, issue the command that will display all VLANs configured. There should be 9 VLANs in total. Notice how all 26 ports on the switch are assigned to one port or another.
      2. On **S2** and **S3**, display and verify all the VLANs are configured and assigned to the correct switchports according to the **Addressing Table**.
   2. Verify loss of connectivity between PCs on the same network.

Although **PC1** and **PC4** are on the same network, they cannot ping one another. This is because the ports connecting the switches are assigned to VLAN 1 by default. In order to provide connectivity between the PCs on the same network and VLAN, trunks must be configured.

1. Configure Trunks
   1. Configure trunking on S1 and use VLAN 99 as the native VLAN.
      1. Configure G1/1 and G1/2 interfaces on S1 for trunking.
      2. Configure VLAN 99 as the native VLAN for G1/1 and G1/2 interfaces on **S1**.

The trunk port takes about a minute to become active due to Spanning Tree which you will learn in the proceeding chapters. Click **Fast Forward Time** to speed the process. After the ports become active, you will periodically receive the following syslog messages:

%CDP-4-NATIVE\_VLAN\_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/2 (99), with S3 GigabitEthernet1/2 (1).

%CDP-4-NATIVE\_VLAN\_MISMATCH: Native VLAN mismatch discovered on GigabitEthernet1/1 (99), with S2 GigabitEthernet1/1 (1).

You configured VLAN 99 as the native VLAN on S1. However, the S2 and S3 are using VLAN 1 as the default native VLAN as indicated by the syslog message.

Although you have a native VLAN mismatch, pings between PCs on the same VLAN are now successful. Why?

On S1’s interface you configured native VLAN 99, which doesn’t affect anything between S2 and S3.

* 1. Verify trunking is enabled on S2 and S3.

On **S2** and **S3**, issue the **show interface trunk** command to confirm that DTP has successfully negotiated trunking with S1 on S2 and S3. The output also displays information about the trunk interfaces on S2 and S3.

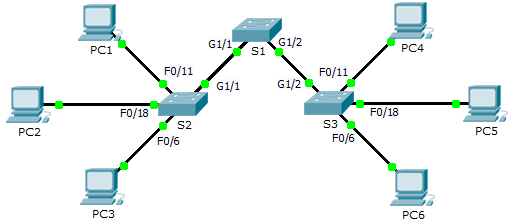
Which active VLANs are allowed to across the trunk? VLAN 1-1005.

* 1. Correct the native VLAN mismatch on S2 and S3.
     1. Configure VLAN 99 as the native VLAN for the appropriate interfaces on S2 and S3.
     2. Issue **show interface trunk** command to verify the correct native VLAN configuration.
  2. Verify configurations on S2 and S3.
     1. Issue the **show interface** *interface* **switchport** command to verify that the native VLAN is now 99.
     2. Use the **show vlan** command to display information regarding configured VLANs. Why is port G1/1 on S2 no longer assigned to VLAN 1?

Because it has been assigned to VLAN 99

Lab 3c – Packet Tracer - Troubleshooting a VLAN Implementation Scenario 1 (PTA 3.2.4.7)

1. Topology



1. Addressing Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Device | Interface | IPv4 Address | Subnet Mask | Switch Port | VLAN |
| PC1 | NIC | 172.17.10.21 | 255.255.255.0 | S1 F0/11 | 10 |
| PC2 | NIC | 172.17.20.22 | 255.255.255.0 | S1 F0/18 | 20 |
| PC3 | NIC | 172.17.30.23 | 255.255.255.0 | S1 F0/6 | 30 |
| PC4 | NIC | 172.17.10.24 | 255.255.255.0 | S2 F0/11 | 10 |
| PC5 | NIC | 172.17.20.25 | 255.255.255.0 | S2 F0/18 | 20 |
| PC6 | NIC | 172.17.30.26 | 255.255.255.0 | S2 F0/6 | 30 |

Objectives

Part 1: Test Connectivity between PCs on the Same VLAN

Part 2: Investigate Connectivity Problems by Gathering Data

Part 3: Implement the Solution and Test Connectivity

1. Scenario

In this activity, you will troubleshoot connectivity problems between PCs on the same VLAN. The activity is complete when PCs on the same VLAN can ping each other. Any solution you implement must conform to the Addressing Table.

1. Test Connectivity between PCs on the Same VLAN

From the command prompton each PC, ping between PCs on the same VLAN.

* + 1. Can PC1 ping PC4? Yes.
    2. Can PC2 ping PC5? Yes,
    3. Can PC3 ping PC6? Yes.

1. Investigate Connectivity Problems by Gathering Data
   1. Verify configuration on the PCs.

Verify if the following configurations for each PC is correct.

* IP address
* Subnet mask
  1. Verify the configuration on the switches.

Verify if the following configurations on the switches are correct.

* Ports assigned to the correct VLANs.
* Ports configured for the correct mode.
* Ports connected to the correct devices.
  1. Document the problem and the solutions.

List the problems and the solutions that will allow these PCs to ping each other. Keep in mind that there could be more than one problem or more than one solution.

PC1 to PC4

* + 1. Explain the connectivity issues between PC1 and PC4.

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* + 1. Record the necessary actions to correct the issues.

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PC2 to PC5

* + 1. Explain the connectivity issues between PC2 and PC5.

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* + 1. Record the necessary actions to correct the issues.

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PC3 to PC6

* + 1. What are the reasons why connectivity failed between the PCs?

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* + 1. Record the necessary actions to correct the issues.

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1. Implement the Solution and Test Connectivity

Verify PCs on the same VLAN can now ping each other. If not, continue to troubleshoot.