PAK AUSTRIA FACHHOCHSCHULE: INSTITUTE OF APPLIED SCIENCES AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEEING

Computer Networks

COMP-352L

LAB TASK 11

School of Computing Sciences

Prepared by:

Laiba Sohail

Sir Hassaan Ali Shah

VLAN Configuration

Overview:

What is Virtual Local Area Network (VLAN)?

VLAN is the abbreviation for Virtual LAN, i.e. Virtual Local Area Network. This is a custom network we create from one or more existing LANs. It enables a group of devices from multiple networks (both wired and wireless) to be combined into a single Logical network. The result is a VLAN that can be administered like a physical area network. The network equipment like routers or switches must support the VLAN configurations to create a VLAN.

Objectives:

Upon completing this lab, participants will be able to:

- Understand the concepts of VLANs and their purpose.
- Create and configure VLANs on Cisco switches.
- Assign VLANs to specific switch ports.
- Configure trunk ports for VLAN communication between switches.
- Verify and troubleshoot VLAN configurations.

Scope:

This lab guides the user through configuring VLANs in a simulated environment using Cisco Packet Tracer. The focus will be on:

- Creating VLANs.
- Assigning switch ports to VLANs.
- Configuring trunk ports for inter-switch VLAN communication.
- Verifying VLAN configuration.

Steps:

Step 1: Set up the network topology

1. Add Devices:
    - 2 Switch (PT-Switch) from network devices.
    - 12 PCs from end devices.
2. Connect Devices:
    - Use straight-through cables to connect PC0, PC1, PC2, PC3, PC4 and PC5 to the switch1.
    - Use straight-through cables to connect PC6, PC7, PC8, PC9, PC10, and PC11 to switch2.
    - Connect the switch1 to switch2 using a cross-over cable.
3. Add extra FastEthernet ports for connecting end-devices.

Step 2: Configure IP addresses on PCs connected to Switch1.

- Open the Desktop tab of each PC, click on IP Configuration, and assign the following IP addresses
    - **PC0:**
        - IP: 192.168.10.1
        - Subnet Mask: 255.255.255.0
    - **PC1:**
        - IP: 191.168.10.2
        - Subnet Mask: 255.255.255.0
    - **PC2:**
        - IP: 192.168.10.3
        - Subnet Mask: 255.255.255.0
    - **PC3:**
        - IP: 192.168.10.4
        - Subnet Mask: 255.255.255.0
    - **PC4:**
        - IP: 191.168.10.5
        - Subnet Mask: 255.255.255.0
    - **PC5:**
        - IP: 192.168.10.6
        - Subnet Mask: 255.255.255.0

Step 3: Configure IP addresses on PCs connected to Switch2.

- Open the Desktop tab of each PC, click on IP Configuration, and assign the following IP addresses
    - **PC6:**
        - IP: 192.168.10.7
        - Subnet Mask: 255.255.255.0
    - **PC7:**

        - IP: 191.168.10.8
        - Subnet Mask: 255.255.255.0
    - **PC8:**
        - IP: 192.168.10.9
        - Subnet Mask: 255.255.255.0
    - **PC9:**
        - IP: 192.168.10.10
        - Subnet Mask: 255.255.255.0
    - **PC10:**
        - IP: 191.168.10.11
        - Subnet Mask: 255.255.255.0
    - **PC11:**
        - IP: 192.168.10.12
        - Subnet Mask: 255.255.255.0

Step 4: Creating two VLANs: Student & Faulty

- Open the Config tab of each Switch, click on Switching , and go to VLAN Database:
- Add two VLANs by entering following:
    - **VLAN STUDENT:**
        - VLAN Number: 150
        - VLAN Name: Student
    - **VLAN FACULTY:**
        - VLAN Number: 250
        - VLAN Name: Faculty

Step 5: Selecting hosts under both VLANs

- Open the Config tab of each Switch, click on Interface , and select as:
    - **VLAN STUDENT:**
        - Click on FastEthernet0/1, Go to VLAN drop-down menu and select 150: Student.
        - Repeat same for FastEthernet1/1 and FastEthernet2/1.
    - **VLAN FACULTY:**
        - Click on FastEthernet3/1, Go to VLAN drop-down menu and select 250: Faculty.
        - Repeat same for FastEthernet4/1 and FastEthernet5/1.

Step 6: Changing Port Mode of Switches

- Open the Config tab of each Switch, click on Interface , and go to FastEthernet6/1 or any last port of FastEthernet and go to Drop-down menu (where Access is set by-default) change it to Trunk mode.

Step 7: Verifying Connectivity within a LAN

- Now our VLAN configuration is ready, and we can check this by sending data packets from one host to another under LAN-A.

- Ping from 192.168.10.1 to 192.168.10.3. To do so, select the host with IP address 192.168.10.1 and then go to Desktop tab and then open Command Prompt. Now run the following command to ping 192.168.10.3.

ping 192.168.10.3

- You can get the Request timed out at first but don't worry, if you followed all the steps mentioned properly then run the command again to ping, and it'll do the job. Be Patient!!

You can also ping the hosts under VLAN-FACULTY by following the previous steps, but you cannot ping from a host under VLAN-STUDENT to a host under VLAN-FACULTY or vice versa. It'll generate a request time out because your created Virtual LAN STUDENT doesn't contain any host with IP addresses from 192.168.10.3 to 192.168.10.6. Similarly, VLAN-FACULTY also doesn't contain IP addresses from 192.168.10.1 to 192.168.10.3.

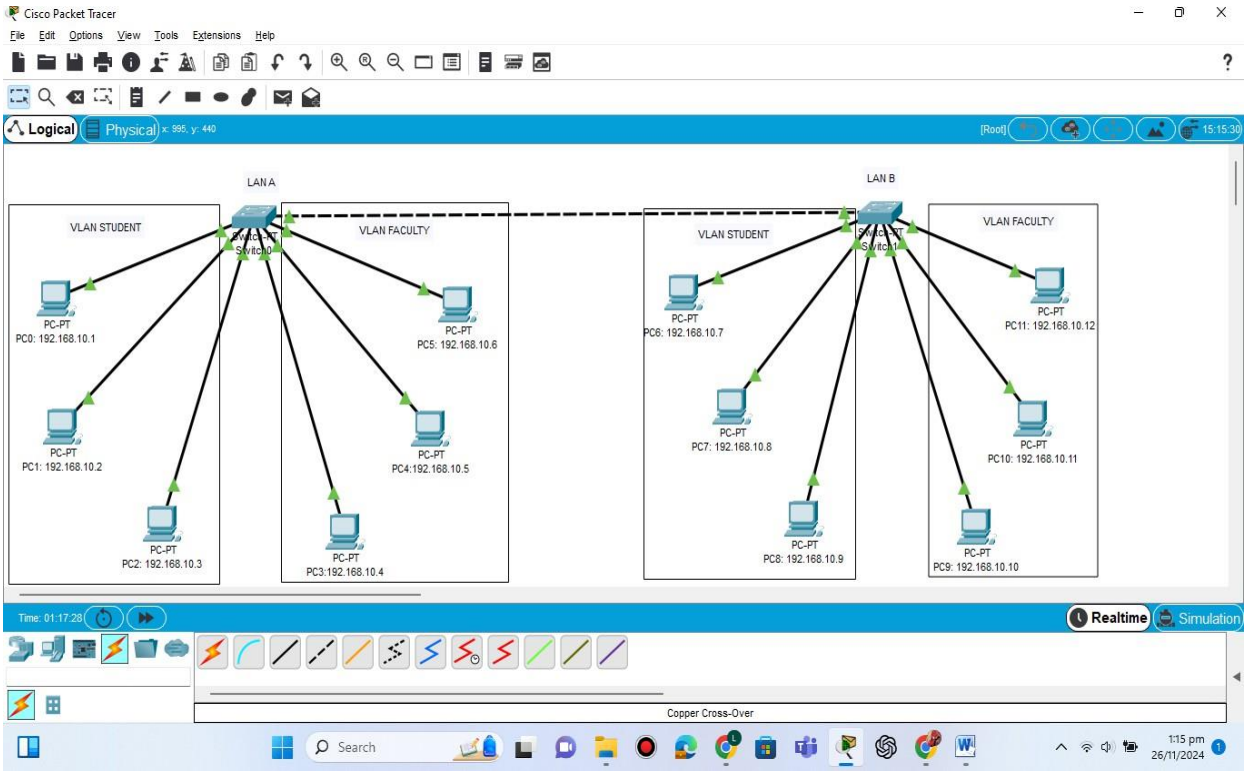
Step 8: Verifying Connectivity between LAN-A & LAN-B

- Ping 192.168.10.5 of LAN-A VLAN-FACULTY to 192.168.10.12 of LAN-B VLAN-FACULTY. To ping again, run the command in the command prompt of the host with IP 192.168.10.5

ping 192.168.10.12

That's how VLAN works!!

FINAL OUTPUT:



TASK:

1. Perform the above steps and make a report by attaching Screenshots of each step. Also write conclusion and what you understand from this lab task.