Lab Manual for Computer Communication and Networking

Lab No. 5

Virtual Private Network(VPN)

BAHRIA UNIVERSITY KARACHI CAMPUS
Department of Software Engineering

COMPUTER COMMUNICATION & NETWORKING

LAB EXPERIMENT # 5

VLANs (Virtual LANs) and Trunks

OBJECTIVE: -

- This lab assignment helps in understanding how VLANs (Virtual LAN) and Trunks can be created on a Cisco switch.

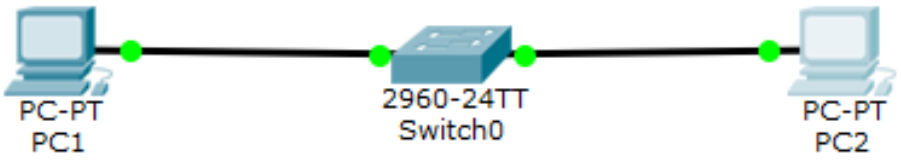
THEORY:

Virtual LAN (VLAN):

A **virtual LAN**, commonly known as a **VLAN**, is a group of hosts with a common set of requirements that communicate as if they were attached to the Broadcast domain, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same network switch. Network reconfiguration can be done through software instead of physically relocating devices.

By default, a Cisco switch creates a VLAN called the Default VLAN 1. All the machines connected to the switch are in the default VLAN 1. It is required to split this by creating one more VLAN called VLAN 2. If you were designing a school, it would be nice to use a VLAN for teacher and a VLAN for students.

NETWORK TOPOLOGY: -



PROCEDURE AND OBSERVATION: -

Switch>en
Switch#config t
Switch(config)#hostname Switch
Switch(config)#vlan 2
Switch(config-vlan)#name Student
Switch(config-vlan)#exit

(PC 2 is connected to port 2 on switch)
Switch(config)#interface FastEthernet 0/2
Switch(config-if)#Switchport mode access
Switch(config-if)#Switchport access vlan 2
Switch(config-if)#exit

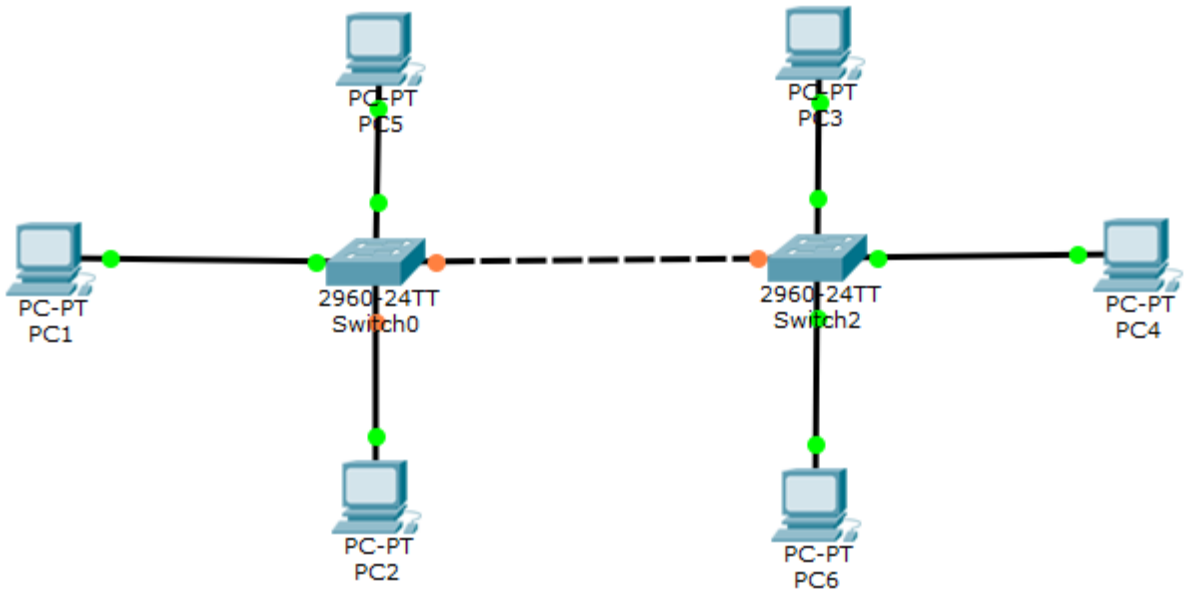
(Show vlan configuration)
Switch# show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, 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
20	students	active	Fa0/1
1002	fddi-default	active	
1003	token-ring	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Trunks:

VLANs can be configured across multiple switches, but a separate port must be assigned for each **VLAN**. A better solution is configuring a **trunk** that can carry all assigned **VLANs** through one port saving all other ports.

NETWORK TOPOLOGY: -



PROCEDURE:

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/3
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 1-99
Switch(config-if)#end

QUESTIONS: -

1. **Connect 4 switches A, B, C and D, all switches must be password protected (encrypted password) and apply the following configuration, show network topology and configuration in your lab task.**

    a. Switch B, C, D must be connected to switch A
    b. Switch B with VLAN name Faculty & Students having 5 logical ports each
    c. Switch C with VLAN name Management having 3 logical ports
    d. Switch D with VLAN name SRC & NCMPR having 3 logical ports each
    e. Choose network IP from Class B for LAN like 172.16.X.X for hosts to test your LAN network

TIME BOXING:

Activity Name	Activity Time	Total Time
Instruments Allocation + Setting up Lab	10 mints	10 mints
Walk through Theory & Tasks (Lecture)	60 mints	60 mints
Implementation & Practice time	90 mints	80 mints
Evaluation Time	20 mints	20 mints
	Total Duration	180 mints