Khwopa College of Engineering
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Department of Computer Engineering

Computer Network (CT 657)

LAB 4

Introduction to Packet Tracer, creation of a LAN and connectivity test in the LAN, creation of VLAN and VLAN Trunking

Objective:

1. To understand the network simulation tool.
2. To understand LAN networking, creation of VLAN, IP addressing in the VLAN and VLAN Trunk.

Aparatus: Packet Tracer or higher.

Theory:

1. Introduction to Packet Tracer
2. LAN Networking
3. Introduction to VLAN
4. VLAN Trunking

You will learn:

i. Configuring and Verifying VLANs
ii. Configuring and Verifying Trunk Links
iii. Configuring Router on a Stick Routing
iv. Configuring IVR with a Layer 3 Switch

Task 1

Draw a LAN topology as shown in figure 1.

Task 2:

Configure ports of switch SW1 and SW2 as follows:

Vlan	Name	Ports	Network Address
10	Student	Fa 0/1	192.168.10.0/24
20	Faculty	Fa 0/2	192.168.20.0/24
30	IT	Fa 0/3	192.168.30.0

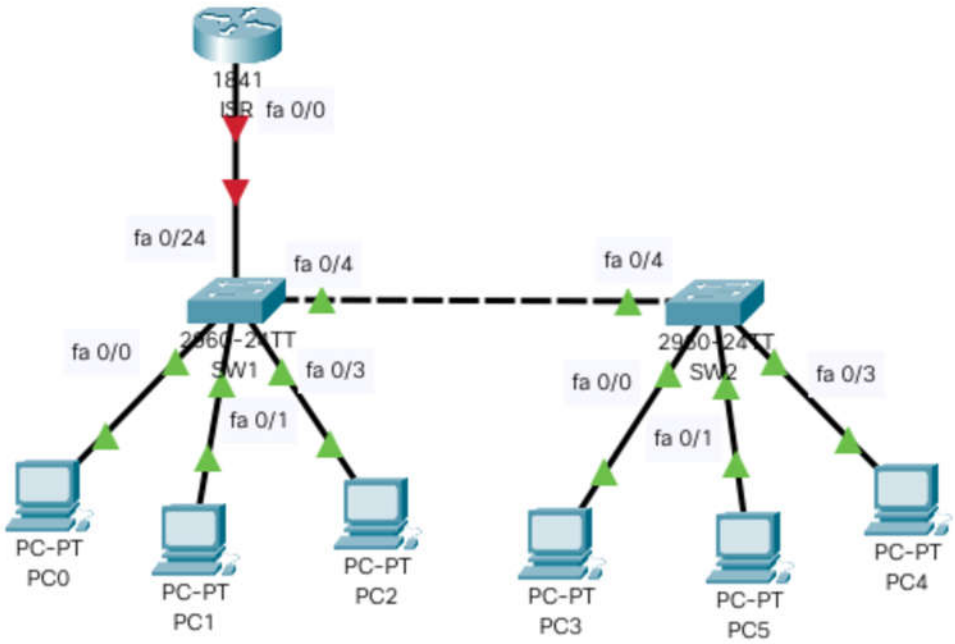

Figure 1: A LAN topology_1.

Configuration for SW1

Creation of vlan

Switch>enable
Swtich#configure terminal
Swtich(config)#hostname SW1
SW1(config)#vlan 10
SW1(config-vlan)#name Student
SW1(config-vlan)#vlan 20
SW1(config-vlan)#name Faculty
SW1(config-vlan)#vlan 30
SW1(config-vlan)#name IT
SW1(config-vlan)#end
SW1#show vlan brief

Q. What is the output?

Assigning Switch port to VLANs
SW1(config)#int f0/1
SW1(config-if)#switchport mode accesss
SW1(config-if)#swtichport access vlan 10
SW1(config-if)#exit
SW1(config)#interface fastEthernet 0/2
SW1(config-if)#switchport mode accesss
SW1(config-if)#swtichport access vlan 20
SW1(config-if)#end
SW1#show interface f0/2 swtichport
SW1(config)#interface fastEthernet 0/3
SW1(config-if)#switchport mode accesss
SW1(config-if)#swtichport access vlan 30
SW1(config-if)#end
SW1#show vlan brief

Q. What do you observe the output?

Configuring Trunk Ports
SW1(config)#int f0/4
SW1(config-if)#switchport mode trunk
SW1(config-if)#exit
SW1(config)#int f0/24
SW1(config-if)#switchport mode trunk
SW1(config-if)#end
SW1#show interface trunk

Q. What do you observe?

Note: This method of trunking is only if you used 2960 model switch. The 2960 switch only runs the IEEE 802.1q encapsulation method. To configure trunking on a FastEthernet port, use the interface command switchport mode trunk . It's a little bit different on the 3560 switch.
The configuration is pretty much the same as it for a 2960, with the exception that the 3560 can provide layer 3 services and 2960 can't. Plus, the 3560 can run both

the ISL and the IEEE 802.1Q trunking encapsulation methods – the 2960 can only run 802.1Q.
The 3560 has the encapsulation command, which 2960 switch doesn't.

Task 3:
Create vlan and configure vlan, vlan trunk in SW2 switch as in Task 2.

Task 4:
Assign IP to hosts connected to the SW1 and SW2. You can either used DHCP or static IP assignment process.

Task 5:
Configuration of Inter-Vlan Routing
By default, only hosts that are members of the same VLAN can communicate. To change this and allow inter-VLAN communication, you need a router or a layer 3 switch.
To support ISL or 802.1q routing on a FastEthernet interface, the router's interface is divided into logical interfaces—one for each VLAN. These are called *subinterfaces*. From a FastEthernet or Gigabit interface, you can set the interface to trunk with the encapsulation command:

```
Router>enable
Router#configure terminal
Router(config)#hostname ISR
ISR(config)#interface f0/0.1
ISR(config-subif)#encapsulation dot1q 10
ISR(config-subif)#ip address 192.168.10.1 255.255.55.0
ISR(config-subif)#exit
```

Note:
Here, 192.168.10.1 is the gateway of all network connected to vlan 10 and 255.255.255.0 is its subnet mask.

```
ISR(config)#interface f0/0.2
ISR(config-subif)#encapsulation dot1q 20
ISR(config-subif)#ip address 192.168.20.1 255.255.55.0
```

```
ISR(config-subif)#exit
ISR(config)#interface f0/0.3
ISR(config-subif)#encapsulation dot1q 30
ISR(config-subif)#ip address 192.168.30.1 255.255.55.0
ISR(config-subif)#exit
ISR(config)#interface f0/0
ISR(config-if)#no shutdown
ISR(config-if)#end
ISR#show running-config
```

Task 6:

Verify the vlan inter-communication

Open command prompt of any PC and ping the IP address of hosts of different different vlan.

Tasks:

1. Show inter-vlan routing in layer 3 switch.
2. Perform inter-vlan routing and verify it for the following two LAN topologies.

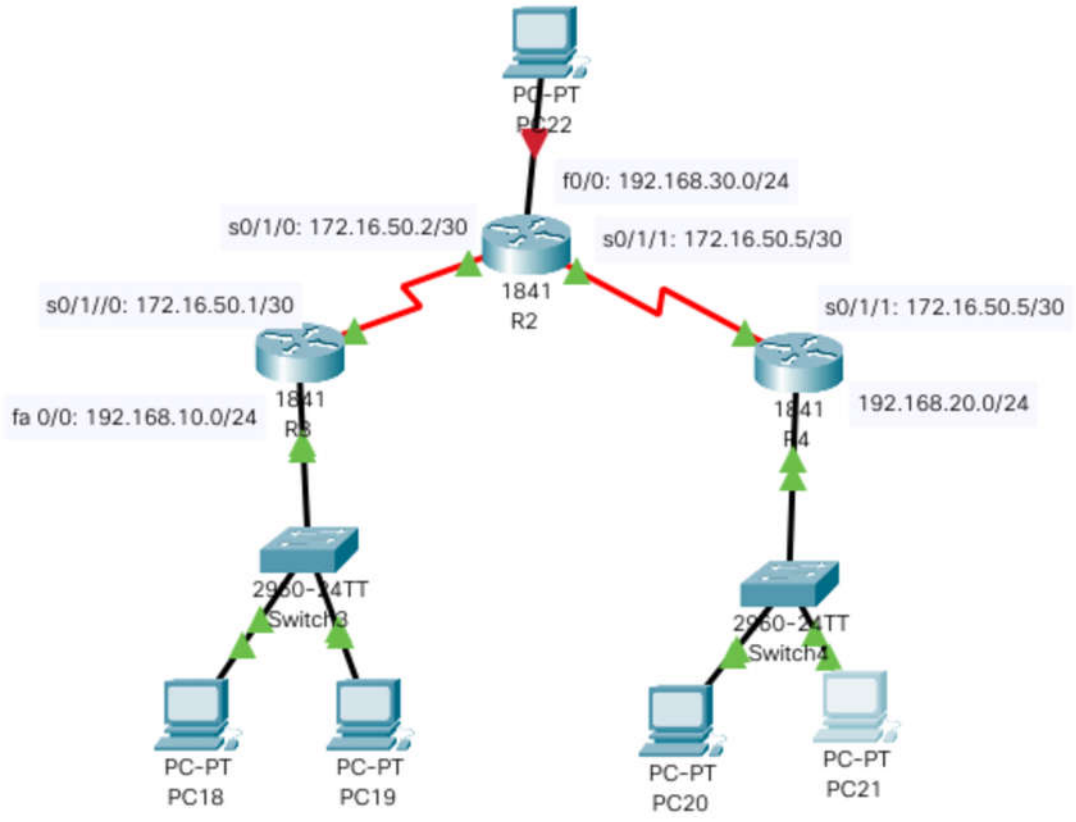

Figure 2: A LAN topology_2.

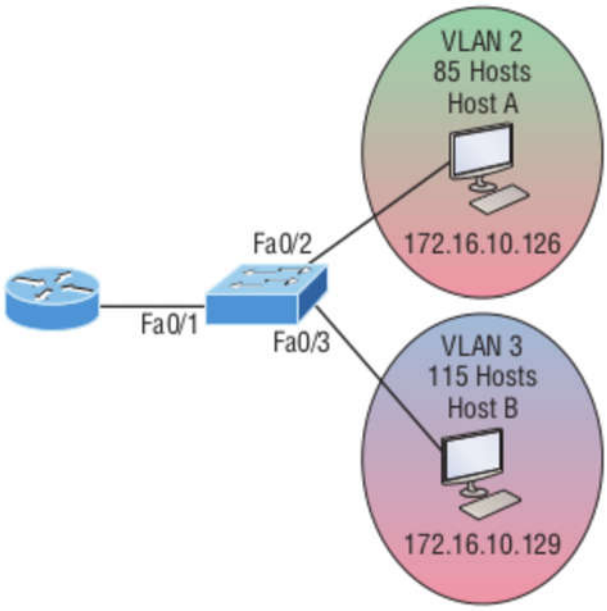

Figure 3: A LAN topology_3.