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<b>Class/Section</b>	<b>S 24 &amp; SLOT 2</b>
<b>Ex.No:</b>	<b>6a</b>
<b>Date of Submission</b>	
<b>Name of the Experiment</b>	<b>Configuration of Inter VLAN network using L3 switch</b>
<b>Google Drive link of the packet tracer file (give view permission):</b>	<a href="https://drive.google.com/drive/folders/1u0glLRHUrpkIJIHqZgKQYhA2odks4oWm?usp=drive_link">https://drive.google.com/drive/folders/1u0glLRHUrpkIJIHqZgKQYhA2odks4oWm?usp=drive link</a>

### Objective(s):

To design and implement Inter VLAN using switch configuration

### Introduction:

Normally, Routers are used to divide the broadcast domain and switches (at layer 2) Operate in a single broadcast domain but Switches can also divide the broadcast domain by using the concept of **VLAN (Virtual LAN)**.

**VLAN** is the logical grouping of devices in the same or different broadcast domains. By default, all the switch ports are in VLAN 1. As the single broadcast domain is divided into multiple broadcast domains, Routers or layer 3 switches are used for intercommunication between the different VLANs. The process of intercommunication of the different Vlan is known as Inter Vlan Routing (IVR).

Suppose we have made 2 logical groups of devices (VLAN) named sales and finance. If a device in the sales department wants to communicate with a device in the finance department, inter-VLAN routing has to be performed. These can be performed by either router or layer 3 switches.

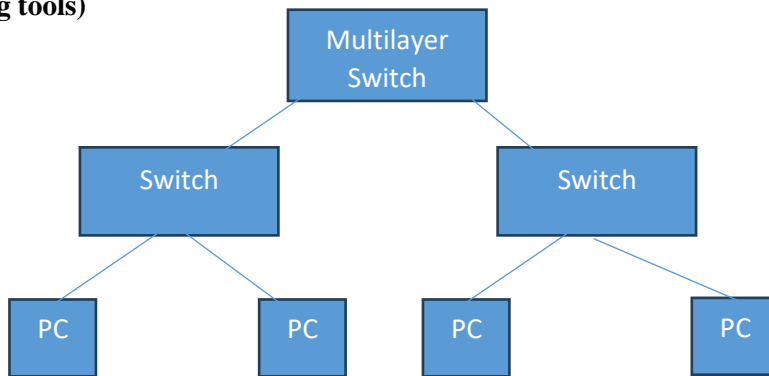
**Switch Virtual Interface (SVI):** SVI is a logical interface on a multilayer switch that provides layer 3 processing for packets to all switch ports associated with that VLAN. A single SVI can be created for a VLAN. SVI on the layer 3 switch provides both management and routing services while SVI on layer 2 switch provides only management services like creating VLANs or telnet/SSH services.

**Process of Inter Vlan Routing by Layer 3 Switch:** The SVI created for the respective VLAN acts as a default gateway for that VLAN just like the sub-interface of the router (in the process of Router On a stick). If the packet is to be delivered to different VLANs i.e inter VLAN Routing is to be performed on the layer 3 switch then first the packet is delivered to the layer 3 switch and then to the destination just like in the process of the router on a stick.

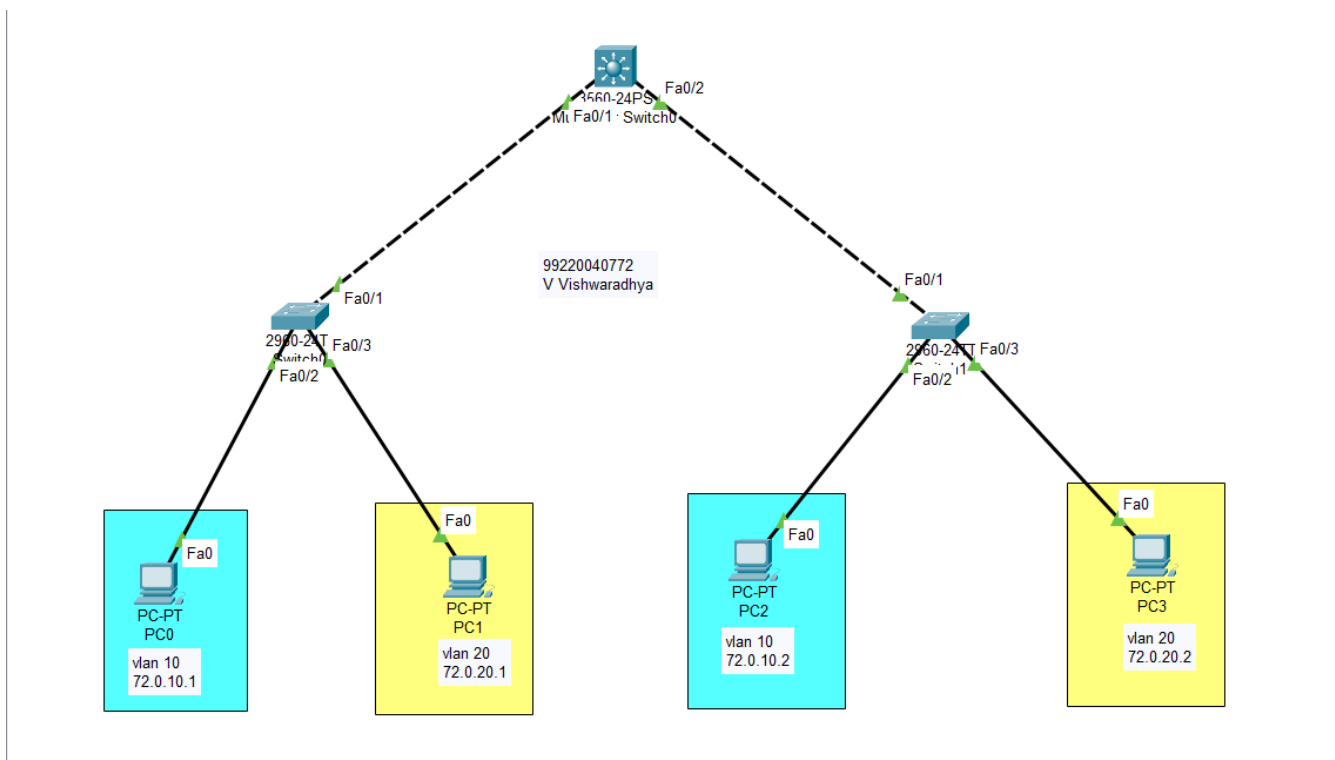
### 1. Device Requirements:

1. PC
2. Switch (2960-24TT)
3. Multilayer Switch
4. Cables (copper straight, copper cross-over)

2. Network Diagram for your experiment (draw the diagram either hand drawing/ms paint or any other drawing tools)



3. Network Diagram (Packet Tracer diagram before configuration):



4. Configuration details:

Device Name	Interface Name	IP Address	Subnet mask
PC0	FastEthernet0/2	72.0.10.1	255.255.255.0
PC1	FastEthernet0/3	72.0.20.1	255.255.255.0
PC2	FastEthernet0/2	72.0.10.2	255.255.255.0
PC3	FastEthernet0/3	72.0.20.2	255.255.255.0

- 5. Describe step by step configuration steps properly (you may copy the commands used in the configuration tab and paste it.)**

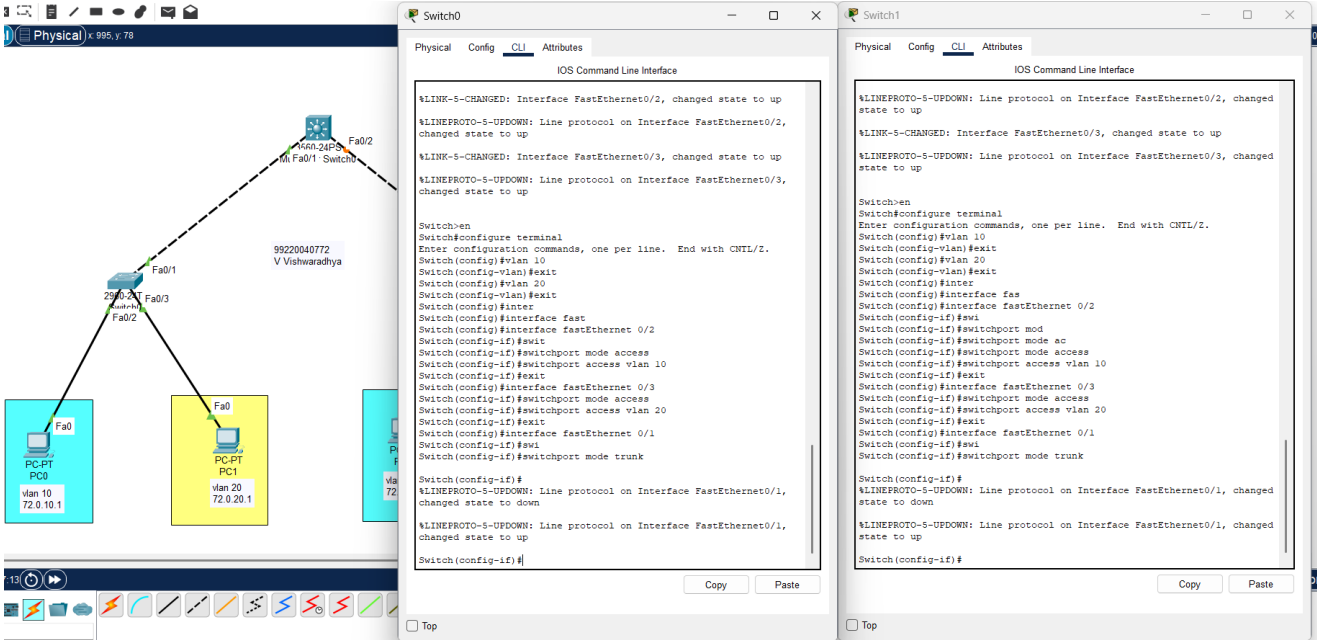
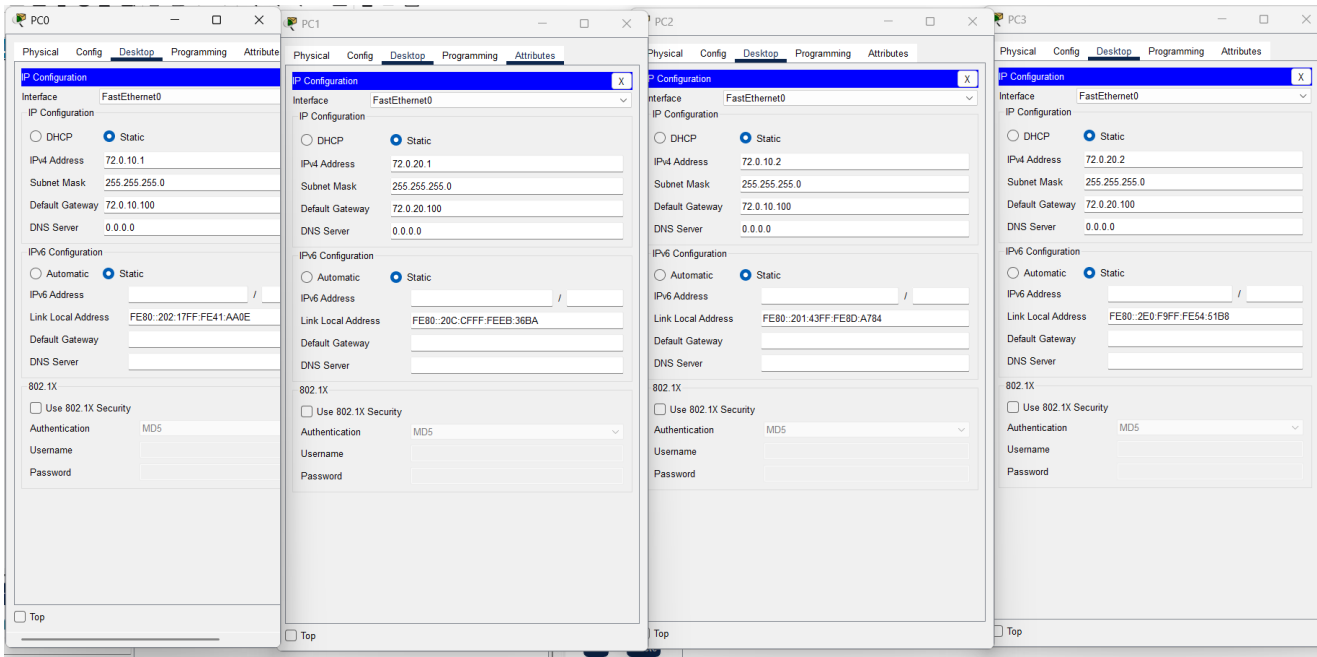
**At Both Switches**

- 1. Enable**
- 2. show vlan**
- 3. configure terminal**
- 4. vlan 10**
- 5. exit**
- 6. vlan 20**
- 7. exit**
- 8. show vlan**
- 9. interface fastEthernet 0/ [interface Number]**
- 10. switchport mode access**
- 11. switchport access vlan [vlan name]**
- 12. enable (On switch 1 and 2)**
- 13. configure terminal**
- 14. interface fastEthernet 0/ [interface Number]**
- 15. switchport mode trunk**

**At Multi-Layer Switch**

- 16. enable**
- 17. configure terminal**
- 18. vlan 10**
- 19. vlan 20**
- 20. interface fastEthernet 0/ [interface Number]**
- 21. switchport trunk encapsulation dot 1q**
- 22. switchport mode trunk**
- 23. exit**
- 24. ip routing**
- 25. interface vlan 10**
- 26. ip address 72.0.10.100 255.255.255.0**
- 27. no shutdown**
- 28. interface vlan 20**
- 29. ip address 72.0.20.100 255.255.255.0**
- 30. no shutdown**

### 6. Output Diagram (Minimum 3 screenshot):



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PC-PT  
PC2  
vlan 10  
72.0.10.2

Multilayer Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch(config)#vlan 20
Switch(config-vlan)#exit
Switch(config)#inter
Switch(config)#interface fas
Switch(config)#interface fastEthernet 0/1
Switch(config-if)#swi
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk en
Switch(config-if)#switchport trunk encapsulation do
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#swi
Switch(config-if)#switchport mo
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#interface fastEthernet 0/2
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#interface vlan 10
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up

Switch(config-if)#exit
Switch(config)#ip routing
Switch(config)#interface vlan 10
Switch(config-if)#ip add
Switch(config-if)#ip address 72.0.10.100 255.255.255.0
Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#interface vlan 20
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to up

Switch(config-if)#ip address 72.0.20.100 255.255.255.0
Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#
```

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PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
IPv6 Address.....: ::
IPv4 Address.....: 72.0.20.1
Subnet Mask.....: 255.255.255.0
Default Gateway.....: ::
72.0.20.100

Bluetooth Connection:

Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0

C:\>ping 72.0.20.2

Pinging 72.0.20.2 with 32 bytes of data:

Reply from 72.0.20.2: bytes=32 time<1ms TTL=128
Reply from 72.0.20.2: bytes=32 time<1ms TTL=128
Reply from 72.0.20.2: bytes=32 time<1ms TTL=128
Reply from 72.0.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 72.0.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 72.0.10.1

Pinging 72.0.10.1 with 32 bytes of data:

Reply from 72.0.10.1: bytes=32 time<1ms TTL=127
Reply from 72.0.10.1: bytes=32 time<1ms TTL=127
Reply from 72.0.10.1: bytes=32 time<1ms TTL=127
Reply from 72.0.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 72.0.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

PC-PT  
PC1  
vlan 20  
72.0.20.1

PC-PT  
PC2  
vlan 10  
72.0.10.2

**CONCLUSION (provide conclusion about this experiment):**

Thus, the design and implementation of Inter VLAN network using switch configuration is successfully implemented using the devices.

**Rubrics for Experiment Assessment:**

<b>Rubrics</b>	<b>Good</b>	<b>Normal</b>	<b>Poor</b>	<b>Marks</b>
<b>Creation of Topology (4)</b>	Created the topology, Identify the proper devices and making the connections <b>(4)</b>	Created the topology, Identify the proper devices, making the connections But missing some features <b>(3)</b>	Created wrong topology, Failed to Identify the proper devices and making connections <b>(1)</b>	
<b>Verify the connectivity (4)</b>	Verified the connectivity in all the levels <b>(4)</b>	Verified the connectivity at some levels (only some nodes) <b>(2)</b>	Verified the connectivity is not done. <b>(1)</b>	
<b>Timely Completion (2)</b>	Completed the lab before the allotted time <b>(2)</b>	Completed the lab after the deadline <b>(1)</b>	Did not submitted before grading <b>(0)</b>	
<b>Total</b>				