Experiment #	<TO BE FILLED BY STUDENT>	**Student ID**	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	**Student Name**	[@KLWKS_BOT] THANOS

Lab 5: Configuration of Encapsulation dot 1Q using cisco packet tracer

Date of the Session:___/___/_____ Session Time:____to_____

Learning outcome:

- Learners will learn how to configure the Encapsulation dot1Q protocol, which is used to tag VLAN information on Ethernet frames.
- Understand the importance of VLAN tagging and how it enables VLAN communication across different network devices..

Pre-Lab Task:

1. What is the purpose of encapsulation dot1Q in networking, and why is it commonly used in Ethernet networks?

Purpose: Dot1Q enables VLANs to share a single Ethernet link by adding a VLAN tag to frames.

2. Explain the concept of VLAN tagging and how it is achieved using encapsulation dot1Q.

VLAN Tagging: Dot1Q encapsulates Ethernet frames with a 4-byte tag, indicating the VLAN ID.

3. Discuss the advantages and benefits of using encapsulation dot1Q in a network environment, such as improved scalability, flexibility, and security.

Advantages: Provides scalability (up to 4096 VLANs), flexibility (shared links), and security (isolated traffic).

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In Lab Task:

Configuration of Encapsulation dot 1Q using cisco packet tracer

Writing space for the Problem:(For Student's use only)

Device Configuration details

Device Name(Label)	Interface	IP Address	Subnet Mask	Default Gateway address
PC - 10	FastEthernet0	10.0.0.2	255.0.0.0	0.0.0.0
PC - 11	FastEthernet0	11.0.0.2	255.0.0.0	0.0.0.0
PC - 12	FastEthernet0	10.0.0.3	255.0.0.0	0.0.0.0
PC - 13	FastEthernet0	11.0.0.3	255.0.0.0	0.0.0.0
MultilayerSwitch 2(MLS)	GigaEthernet0	10.0.0.1	255.0.0.0	0.0.0.0
MultilayerSwitch 2(MLS)	GigaEthernet0	11.0.0.1	255.0.0.0	0.0.0.0

Switch 4

```
Switch>en

Switch#config t

Switch(config)#vlan 10

Switch(config-vlan)#name Sales

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name Admin

Switch(config-vlan)#exit

Switch(config)#int f0/1

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 10

Switch(config-if)#exit

Switch(config)#int f0/2

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 20

Switch(config)#int g0/1

Switch(config-if)#switchport mode trunk

Switch(config)#int g0/2

Switch(config-if)#switchport mode trunk
```

Switch 5

Switch>en

Switch#config t

Switch(config)#vlan 10

Switch(config-vlan)#name Sales

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name Admin

Switch(config-vlan)#exit

Switch(config)#int f0/1

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 10

Switch(config-if)#exit

Switch(config)#int f0/2

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 20

Switch(config)#int g0/1

Switch(config-if)#switchport mode trunk

Configuration of Multilayer Switch

Switch>en

Switch#config t

Switch(config)#vlan 10

Switch(config-vlan)#name Sales

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name Admin

Switch(config-vlan)#exit

Switch(config)#int vlan 10

Switch(config-if)#int vlan 10

Switch(config-if)#ip address 10.0.0.1 255.0.0.0

Switch(config-if)#exit

Switch(config)#int vlan 20

Switch(config-if)#ip address 11.0.0.1 255.0.0.0

Switch(config-if)#exit

Switch(config)#int g1/0/1

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk encapsulation dot1

Switch(config-if)#exit

Switch(config)#ip routing

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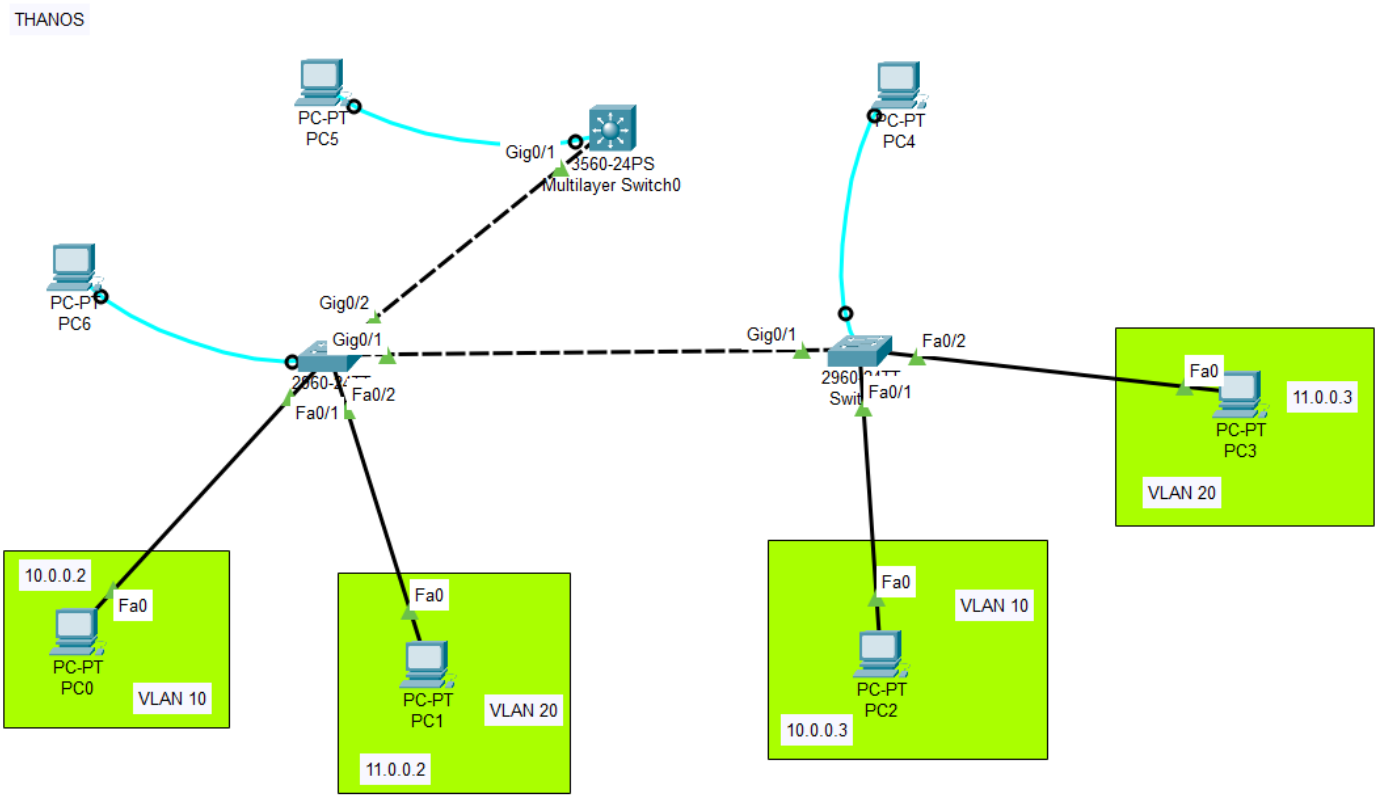
Diagram



VIVA-VOCE Questions (In-Lab):

1. What is encapsulation dot1Q, and what is its purpose in networking?

VLAN tagging protocol (IEEE 802.1Q) for trunk links.

2. What is the significance of the VLAN ID in encapsulation dot1Q?

Identifies VLAN, enabling traffic segmentation.

3. Explain the differences between encapsulation dot1Q and other trunking protocols, such as ISL (Inter-Switch Link).

Dot1Q is open standard, 4-byte tag; ISL is Cisco proprietary.

4. How does encapsulation dot1Q support VLAN tagging and segmentation of traffic?

Tags frames to keep VLAN traffic isolated.

5. How can you remove the encapsulation dot1Q configuration from an interface if needed?

Use `no switchport trunk encapsulation dot1q` or `no switchport mode trunk`.

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Post Lab Task:

1. Describe the network topology you used for configuring Encapsulation dot1Q using Cisco Packet Tracer.

- Two switches, a router, and three VLANs (10, 20, 30).
- Router-on-a-Stick for inter-VLAN communication.

2. What steps or commands did you use to enable and configure VLAN tagging?

On Switch:

bash Copy Edit

```
Switch(config)# vlan 10
Switch(config)# interface gig0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk encapsulation dot1q
```

On Router:

bash Copy Edit

```
Router(config)# interface gig0/0.10
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.10.1 255.255.255.0
```

3. Explain the purpose and significance of VLAN tagging using Encapsulation dot1Q.

- Separates traffic, improves security, and enhances scalability.
- Enables multiple VLANs on one trunk link.
- Allows inter-VLAN communication via a router.

Evaluator Remark (if Any):	**Marks Secured_____out of 50**
	Signature of the Evaluator with Date