TP-LINK®
The Reliable Choice

Configuration Guide

Managing MAC VLAN

TP-LINK Managed Switches

CONTENTS

1 MAC VLAN 1-1

2 MAC VLAN Configuration 1-2

2.1 Using the GUI 1-2

2.1.1 Configuring 802.1Q VLAN 1-2

2.1.2 Binding the MAC Address to the VLAN 2-1

2.1.3 Enabling MAC VLAN for the Port 2-1

2.2 Using the CLI 2-2

2.2.1 Configuring 802.1Q VLAN 2-2

2.2.2 Binding the MAC Address to the VLAN 2-2

2.2.3 Enable MAC VLAN for the Port 2-3

3 Example for Configuring MAC VLAN 3-1

3.1 Network Requirements 3-1

3.2 Configuration Scheme 3-1

3.3 Using the GUI 3-2

3.4 Using the CLI 3-4

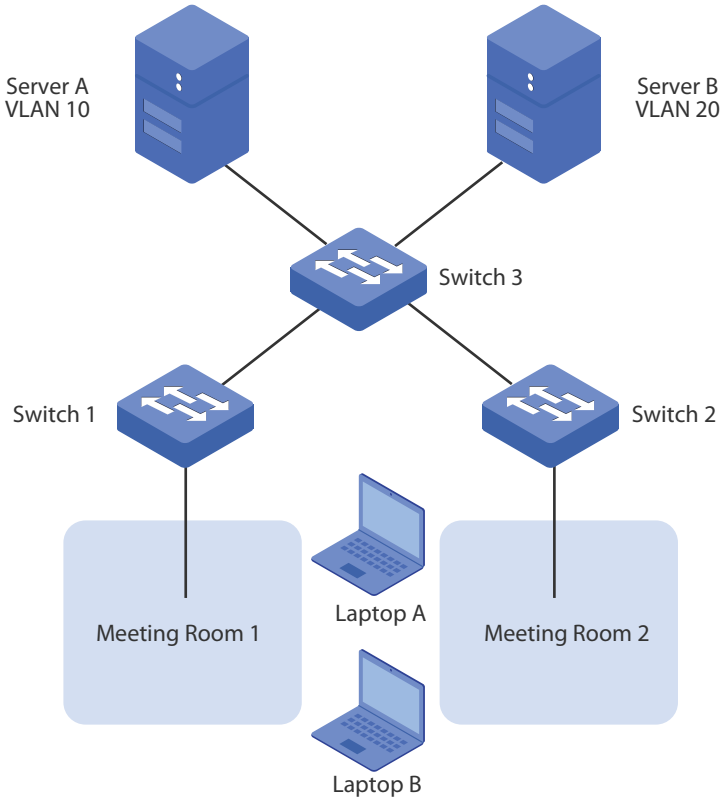
4 Appendix: Default Parameters 4-1

1 MAC VLAN

VLAN is generally divided by ports. This way of division is simple but isn't suitable for those networks that require frequent topology changes. With the popularity of mobile office, a terminal device may access the switch via different ports. For example, a terminal device that accessed the switch via port 1 last time may change to port 2 this time. If port 1 and port 2 belong to different VLANs, the user has to re-configure the switch to access the original VLAN. Using MAC VLAN can free the user from such a problem. It divides VLANs based on the MAC addresses of terminal devices. In this way, terminal devices always belong to their original VLANs even when their access ports change.

The figure below shows a common application scenario of MAC VLAN.

Figure 1-1 Common Application Scenario of MAC VLAN



Two departments share all the meeting rooms in the company, but use different servers and laptops. Department A uses Server A and Laptop A, while Department B uses Server B and Laptop B. Server A is in VLAN 10 while Server B is in VLAN 20. It is required that Laptop A can only access Server A and Laptop B can only access Server B, no matter which meeting room the laptops are being used in. To meet this requirement, simply bind the MAC addresses of the laptops to the corresponding VLANs respectively. In this way, the MAC address rather than the access port determines the VLAN each laptop joins. Each laptop can access only the server in the VLAN it joins.

2 MAC VLAN Configuration

To complete MAC VLAN configuration, follow these steps:

1) Configure 802.1Q VLAN.

2) Bind the MAC address to the VLAN.

3) Enable MAC VLAN for the port.

Configuration Guidelines

When a port in a MAC VLAN receives an untagged data packet, the switch will first check whether the source MAC address of the data packet has been bound to the MAC VLAN. If yes, the switch will insert the corresponding tag to the data packet and forward it within the VLAN. If no, the switch will continue to match the data packet with the matching rules of other VLANs (such as the protocol VLAN). If there is a match, the switch will forward the data packet. Otherwise, the switch will process the data packet according to the processing rule of the 802.1 Q VLAN. When the port receives a tagged data packet, the switch will directly process the data packet according to the processing rule of the 802.1 Q VLAN.

2.1 Using the GUI

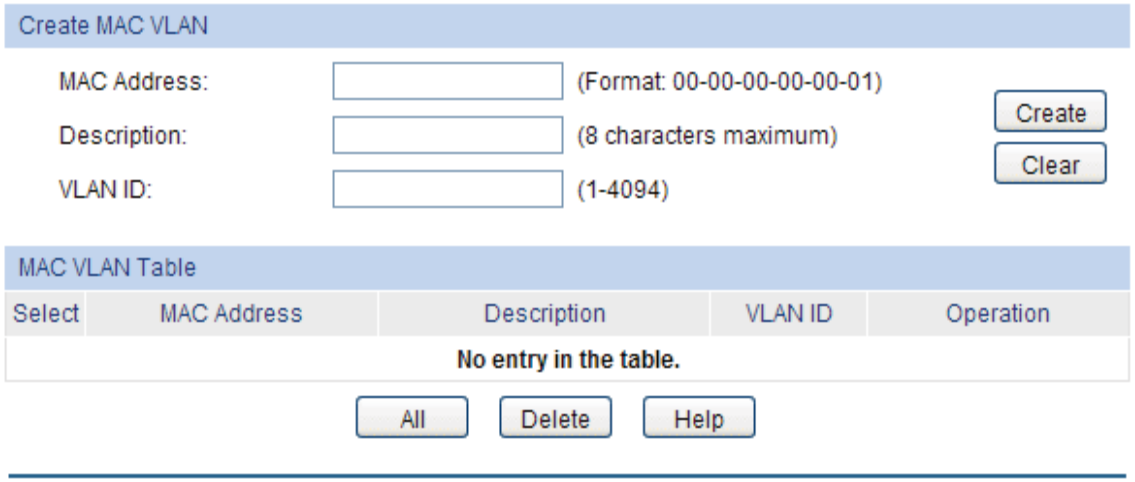
2.1.1 Configuring 802.1Q VLAN

Before configuring MAC VLAN, create an 802.1Q VLAN and set the port type according to network requirements. For details, refer to *Managing 802.1Q VLAN*.

2.1.2 Binding the MAC Address to the VLAN

Choose the menu **VLAN > MAC VLAN > MAC VLAN** to load the following page.

Figure 2-1 MAC VLAN Configuration



Follow these steps to bind the MAC address to the VLAN:

1) Enter the MAC address of the device, give it a description, and enter the VLAN ID to bind it to the VLAN.

MAC Address	Enter the MAC address of the device. The address should be in 00-00-00-00-00-01 format.
Description	Give a MAC address description for identification with up to 8 characters.
VLAN ID	Enter the ID of the 802.1Q VLAN where the port with MAC VLAN enabled is.

2) Click **Create** to create the MAC VLAN.

Note:

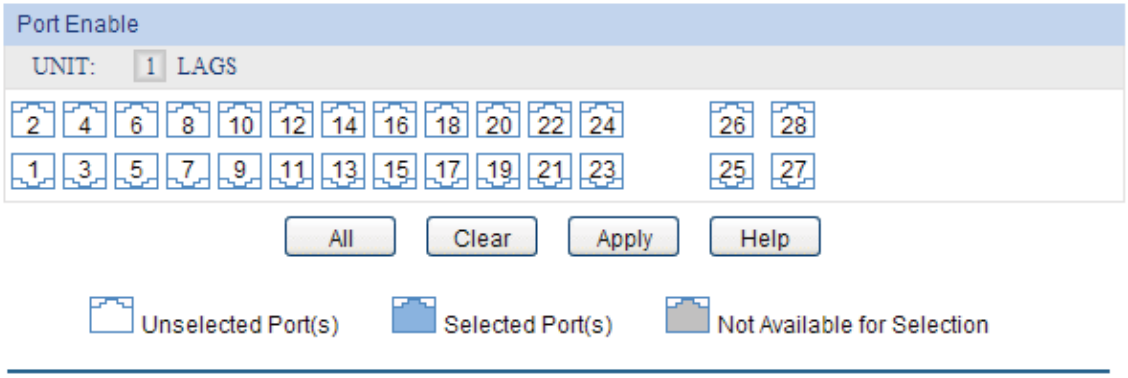
One MAC address can be bound to only one VLAN.

2.1.3 Enabling MAC VLAN for the Port

By default, MAC VLAN is disabled on all ports. You need to enable MAC VLAN for your desired ports manually.

Choose the menu **VLAN > MAC VLAN > Port Enable** to load the following page.

Figure 2-2 Enable MAC VLAN for the Port



Follow these steps to enable MAC VLAN for the port:

Select your desired ports to enable MAC VLAN, and click **Apply** to make the settings effective.

Note:

For T2600G series switches, the member pot of a LAG (Link Aggregation Group) follows the configuration of the LAG but not its own. The configurations of the port can take effect only after it leaves the LAG.

2.2 Using the CLI

2.2.1 Configuring 802.1Q VLAN

Before configuring MAC VLAN, create an 802.1Q VLAN and set the port type according to network requirements. For details, refer to *Managing 802.1Q VLAN*.

2.2.2 Binding the MAC Address to the VLAN

Follow these steps to bind the MAC address to the VLAN:

Step 1	**configure** Enter global configuration mode.
Step 2	**mac-vlan mac-address** *mac-addr* **vlan** *vlan-id* **[description** *descript***]** Bind the MAC address to the VLAN. *mac-addr*: MAC address of the device. The address should be in 00-00-00-00-00-01 format. *vlan-id*: ID of the 802.1Q VLAN where the port with MAC VLAN enabled is. *descript*: MAC address description for identification, with up to 8 characters.
Step 4	**end** Return to privileged EXEC mode.

Step 5	**copy running-config startup-config** Save the settings in the configuration file.

The following example shows how to bind the MAC address 00:19:56:8A:4C:71 to VLAN 10, with the address description as Dept.A.

Switch#configure

Switch(config)#mac-vlan mac-address 00:19:56:8a:4c:71 **vlan** 10 **description** Dept.A

Switch(config)#show mac-vlan vlan 10

MAC-Addr	Name	VLAN-ID
---	---	---
00:19:56:8A:4C:71	Dept.A	10

Switch(config)#end

Switch#copy running-config startup-config

2.2.3 Enable MAC VLAN for the Port

Follow these steps to enable MAC VLAN for the port:

Step 1	**configure** Enter global configuration mode.
Step 2	**interface [fastEthernet** *port* **| range fastEthernet** *port-list* **| gigabitEthernet** *port* **| range gigabitEthernet** *port-list***]** Enter interface configuration mode.
Step 3	**mac-vlan** Enable MAC VLAN for the port.
Step 5	**end** Return to privileged EXEC mode.
Step 6	**copy running-config startup-config** Save the settings in the configuration file.

The following example shows how to enable MAC VLAN for port 1/0/1.

Switch#configure

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#mac-vlan

Switch(config-if)#show mac-vlan interface

Port STATUS

------- -----------

Gi1/0/1 Enable

Gi1/0/2 Disable

.....

Switch(config-if)#end

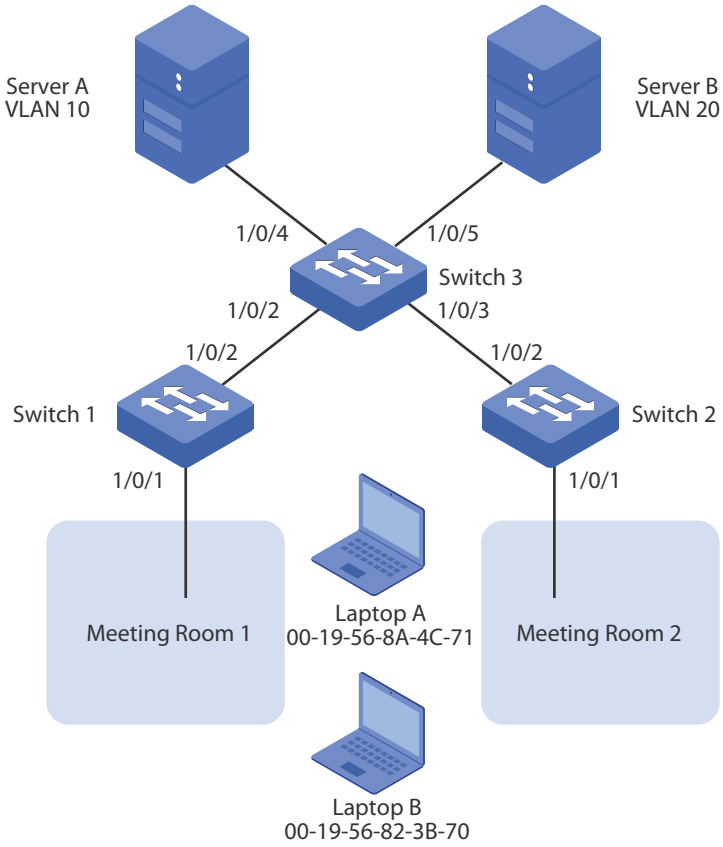
Switch#copy running-config startup-config

3 Example for Configuring MAC VLAN

3.1 Network Requirements

Two departments share all the meeting rooms in the company, but use different servers and laptops. Department A uses Server A and Laptop A, while Department B uses Server B and Laptop B. Server A is in VLAN 10 while Server B is in VLAN 20. It is required that Laptop A can only access Server A and Laptop B can only access Server B, no matter which meeting room the laptops are being used in. The figure below shows the network topology.

Figure 3-1 Network Topology



3.2 Configuration Scheme

You can configure MAC VLAN to meet this requirement. On Switch 1 and Switch 2, bind the MAC addresses of the laptops to the corresponding VLANs respectively. In this way, each laptop can access only the server in the VLAN it joins, no matter which meeting room the laptops are being used in. The overview of the configuration is as follows:

1) Create VLAN 10 and VLAN 20 on each of the three switches, set different port types, and add the ports to the VLANs based on the network topology. Note: For the ports connecting the laptops, set the port type as General, and set the egress rule as Untag.

2) On Switch 1 and Switch 2, bind the MAC addresses of the laptops to their corresponding VLANs, and enable MAC VLAN for the ports.

Exampled with T2600G-28TS, the following sections provide configuration procedure in two ways: using the GUI and using the CLI.

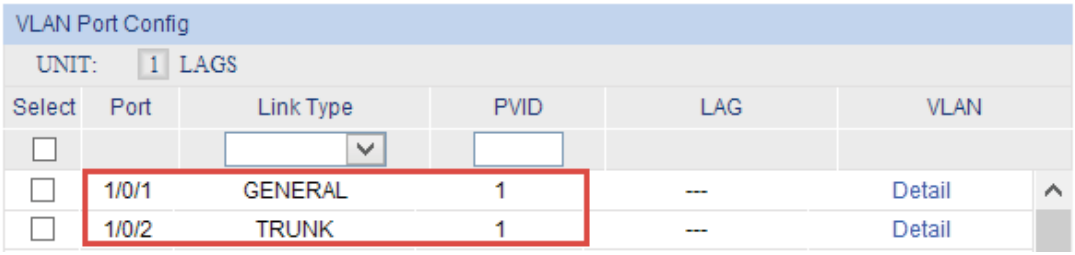
3.3 Using the GUI

■ Configurations for Switch 1 and Switch 2:

The configurations of Switch 1 and Switch 2 are similar. The following introductions take Switch 1 as an example.

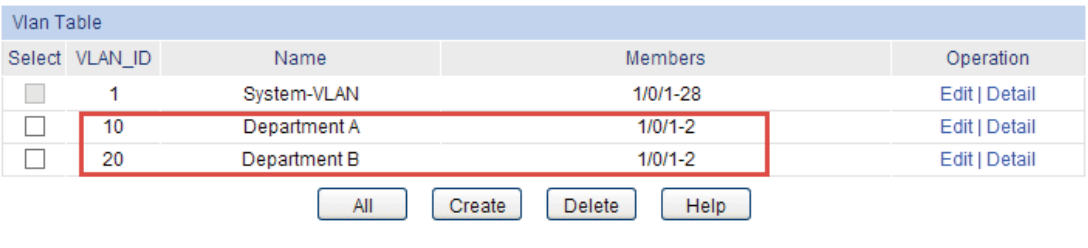
1) Choose the menu **VLAN > 802.1Q VLAN > Port Config** to load the following page. For port 1/0/1, set the type as **General**, and keep the egress rule as the default value **Untag**. For port 1/0/2, set the type as **Trunk**.

Figure 3-2 Port Configuration



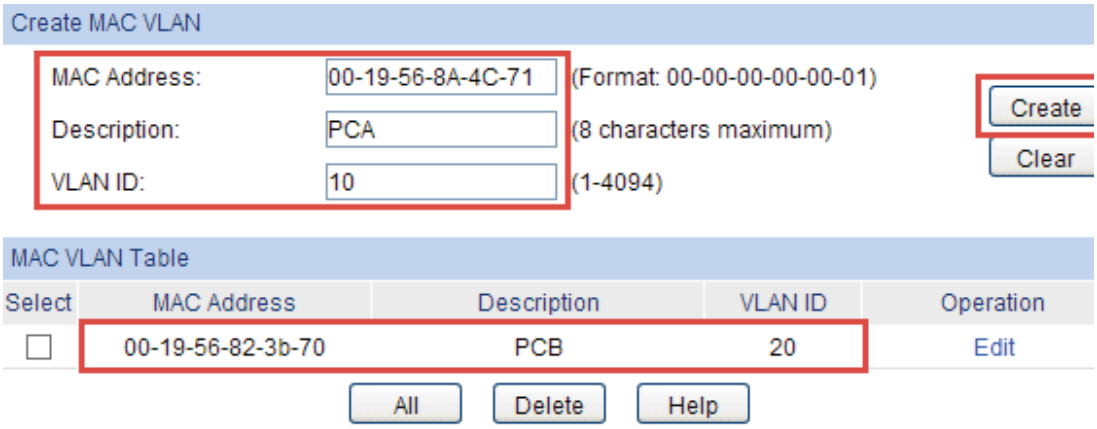
2) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page. Create VLAN 10 and VLAN 20, and add port 1/0/1 and port 1/0/2 to both VLAN 10 and VLAN 20.

Figure 3-3 802.1Q VLAN Configuration



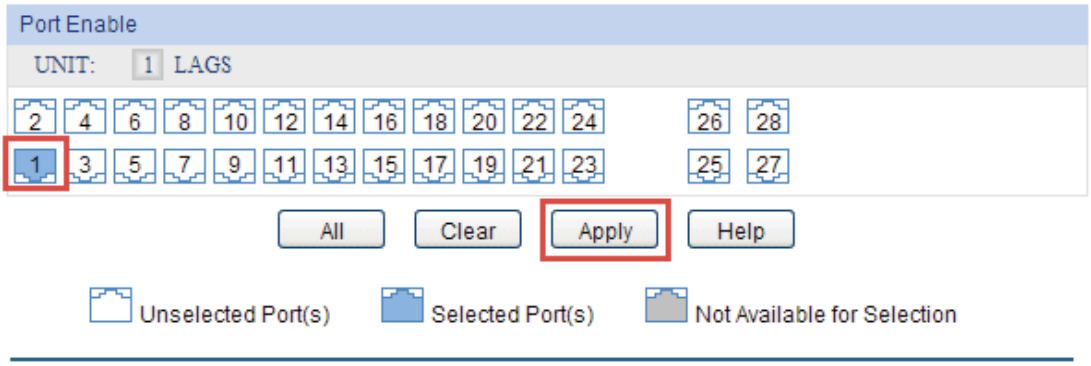
3) Choose the menu **VLAN > MAC VLAN > MAC VLAN** to load the following page. Enter **MAC Address**, **Description**, **VLAN ID** and click **Create** to bind the MAC address of Laptop A to VLAN 10 and bind the MAC address of Laptop B to VLAN 20.

Figure 3-4 MAC VLAN Configuration



4) Choose the menu **VLAN > MAC VLAN > Port Enable** to load the following page. Select port 1/0/1 and click **Apply** to enable MAC VLAN for it.

Figure 3-5 Enable MAC VLAN for the Port

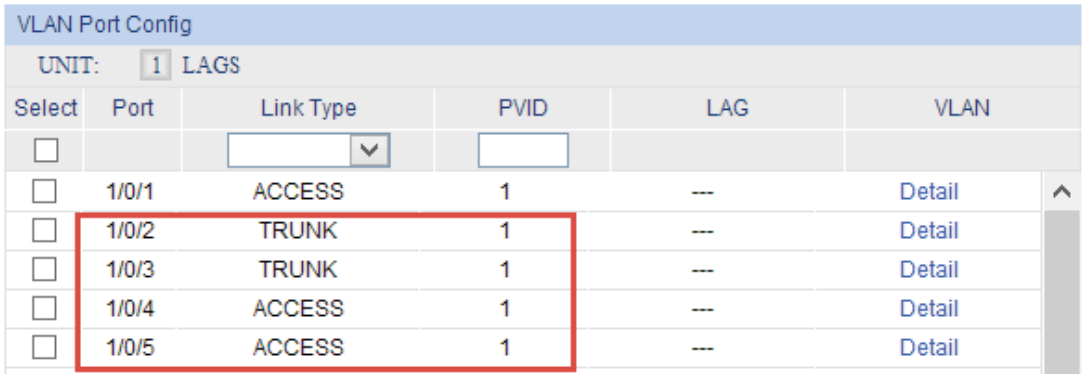


5) Click **Save Config** to make the settings effective.

Configurations for Switch 3:

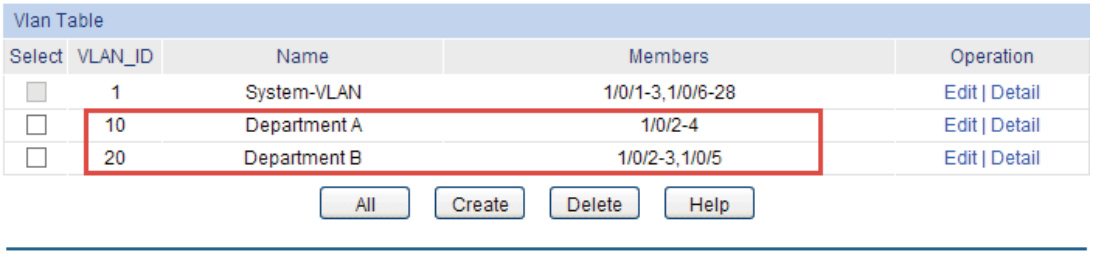
1) Choose the menu **VLAN > 802.1Q VLAN > Port Config** to load the following page. For port 1/0/2 and port 1/0/3, set the type as **Trunk**. For port 1/0/4 and port 1/0/5, set the type as the default value **Access**.

Figure 3-6 Port Configuration



2) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page. Create VLAN 10, and add port 1/0/2, port 1/0/3, and port 1/0/4 to it. Create VLAN 20, and add port 1/0/2, port 1/0/3, and port 1/0/5 to it.

Figure 3-7 802.1Q VLAN Configuration



3) Click **Save Config** to make the settings effective.

3.4 Using the CLI

■ Configurations for Switch 1 and Switch 2:

The configurations of Switch 1 and Switch 2 are similar. The following introductions take Switch 1 as an example.

1) Create VLAN 10 for Department A and create VLAN 20 for Department B.

```
Switch_1#configure
Switch_1(config)#vlan 10
Switch_1(config-vlan)#name deptA
Switch_1(config-vlan)#exit
Switch_1(config)#vlan 20
Switch_1(config-vlan)#name deptB
Switch_1(config-vlan)#exit
```

2) For port 1/0/2, set the type as Trunk, and add it to both VLAN 10 and VLAN 20.

```
Switch_1(config)#interface gigabitEthernet 1/0/2
Switch_1(config-if)#switchport mode trunk
Switch_1(config-if)#switchport trunk allowed vlan 10,20
Switch_1(config-if)#exit
```

3) For port 1/0/1, set the type as General, set the egress rule as untagged, and add it to both VLAN 10 and VLAN 20. Then enable MAC VLAN for port 1/0/1.

```
Switch_1(config)#interface gigabitEthernet 1/0/1
Switch_1(config-if)#switchport mode general
Switch_1(config-if)#switchport general allowed vlan 10,20 untagged
Switch_1(config-if)#mac-vlan
Switch_1(config-if)#exit
```

4) Bind the MAC address of Laptop A to VLAN 10 and bind the MAC address of Laptop B to VLAN 20.

```
Switch_1(config)#mac-vlan mac-address 00:19:56:8A:4C:71 vlan 10 description PCA
Switch_1(config)#mac-vlan mac-address 00:19:56:82:3B:70 vlan 20 description PCB
```

■ Configurations for Switch 3:

1) Create VLAN 10 for Department A and create VLAN 20 for Department B.

```
Switch_3#configure
Switch_3(config)#vlan 10
Switch_3(config-vlan)#name deptA
Switch_3(config-vlan)#exit
Switch_3(config)#vlan 20
Switch_3(config-vlan)#name deptB
Switch_3(config-vlan)#exit
```

2) For port 1/0/2 and port 1/0/3, set the type as Trunk, and add them to both VLAN 10 and VLAN 20.

```
Switch_3(config)#interface gigabitEthernet 1/0/2
```

```
Switch_3(config-if)#switchport mode trunk
Switch_3(config-if)#switchport trunk allowed  vlan 10,20
Switch_3(config-if)#exit
Switch_3(config)#interface gigabitEthernet 1/0/3
Switch_3(config-if)#switchport mode trunk
Switch_3(config-if)#switchport trunk allowed  vlan 10,20
Switch_3(config-if)#exit
```

3) For port 1/0/4 and port 1/0/5, set the type as Access, and add them to both VLAN 10 and VLAN 20.

```
Switch_3(config)#interface gigabitEthernet 1/0/4
Switch_3(config-if)#switchport mode access
Switch_3(config-if)#switchport access vlan 10
Switch_3(config-if)#exit
Switch_3(config)#interface gigabitEthernet 1/0/5
Switch_3(config-if)#switchport mode access
Switch_3(config-if)#switchport access vlan 20
Switch_3(config-if)#end
Switch_3#copy running-config startup-config
```

Configuration File

Switch 1:

```
Switch_1#configure
Switch_1(config)#vlan 10
Switch_1(config-vlan)#name deptA
Switch_1(config-vlan)#exit
Switch_1(config)#vlan 20
Switch_1(config-vlan)#name deptB
Switch_1(config-vlan)#exit
```

```
Switch_1(config)#interface gigabitEthernet 1/0/2
Switch_1(config-if)#switchport mode trunk
Switch_1(config-if)#switchport trunk allowed vlan 10,20
Switch_1(config-if)#exit
Switch_1(config)#interface gigabitEthernet 1/0/1
Switch_1(config-if)#switchport mode general
Switch_1(config-if)#switchport general allowed vlan 10,20 untagged
Switch_1(config-if)#mac-vlan
Switch_1(config-if)#exit
Switch_1(config)#mac-vlan mac-address 00:19:56:8A:4C:71 vlan 10 description PCA
Switch_1(config)#mac-vlan mac-address 00:19:56:82:3B:70 vlan 20 description PCB
Switch_1(config)#end
Switch_1#copy running-config startup-config
```

- Switch 2:

```
Switch_2#configure
Switch_2(config)#vlan 10
Switch_2(config-vlan)#name deptA
Switch_2(config-vlan)#exit
Switch_2(config)#vlan 20
Switch_2(config-vlan)#name deptB
Switch_2(config-vlan)#exit
Switch_2(config)#interface gigabitEthernet 1/0/2
Switch_2(config-if)#switchport mode trunk
Switch_2(config-if)#switchport trunk allowed vlan 10,20
Switch_2(config-if)#exit
Switch_2(config)#interface gigabitEthernet 1/0/1
Switch_2(config-if)#switchport mode general
```

```
Switch_2(config-if)#switchport general allowed  vlan 10,20 untagged

Switch_2(config-if)#exit

Switch_2(config)#mac-vlan mac-address 00:19:56:8A:4C:71 vlan 10 description PCA

Switch_2(config)#mac-vlan mac-address 00:19:56:82:3B:70 vlan 20 description PCB

Switch_2(config-if)#mac-vlan

Switch_2(config-if)#end

Switch_2#copy running-config startup-config
```

- Switch 3:

```
Switch_3#configure

Switch_3(config)#vlan 10

Switch_3(config-vlan)#name deptA

Switch_3(config-vlan)#exit

Switch_3(config)#vlan 20

Switch_3(config-vlan)#name deptB

Switch_3(config-vlan)#exit

Switch_3(config)#interface gigabitEthernet 1/0/2

Switch_3(config-if)#switchport mode trunk

Switch_3(config-if)#switchport trunk allowed  vlan 10,20

Switch_3(config-if)#exit

Switch_3(config)#interface gigabitEthernet 1/0/3

Switch_3(config-if)#switchport mode trunk

Switch_3(config-if)#switchport trunk allowed  vlan 10,20

Switch_3(config-if)#exit

Switch_3(config)#interface gigabitEthernet 1/0/4

Switch_3(config-if)#switchport mode access

Switch_3(config-if)#switchport access vlan 10

Switch_3(config-if)#exit
```

```
Switch_3(config)#interface gigabitEthernet 1/0/5
Switch_3(config-if)#switchport mode access
Switch_3(config-if)#switchport access vlan 20
Switch_3(config-if)#end
Switch_3#copy running-config startup-config
```

Verify the Configurations

- ### Switch 1:

```
Switch_1#show mac-vlan all
MAC Address          Description          VLAN
---------------------  -----------------  ----------
00:19:56:8A:4C:71    PCA                  10
00:19:56:82:3B:70    PCB                  20
-----------------------------------------------------------------
```

- ### Switch 2:

```
Switch_2#show mac-vlan all
MAC Address          Description          VLAN
---------------------  --------------------  -----------
00:19:56:8A:4C:71    PCA                  10
00:19:56:82:3B:70    PCB                  20
-----------------------------------------------------------------------
```

- ### Switch 3:

```
Switch_3#show vlan
VLAN     Name            Status        Ports
--------  ---------------  -------------  ------------------------------------------
1        Default VLAN    active        Gi1/0/1, Gi1/0/2, Gi1/0/3, Gi1/0/6
                                       Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10
```

.....

10	DeptA	active	Gi1/0/2, Gi1/0/3, Gi1/0/4
20	DeptB	active	Gi1/0/2, Gi1/0/3, Gi1/0/5

4 Appendix: Default Parameters

Default settings of MAC VLAN are listed in the following table.

Table 4-1 Default Settings of Protocol VLAN

Parameter	Defualt Setting
MAC Address	None
Description	None
VLAN ID	None
Port Enable	Disable