



# Configuring GVRP

---

## CHAPTERS

1. Overview
2. GVRP Configuration
3. Configuration Example
4. Appendix: Default Parameters



### This guide applies to:

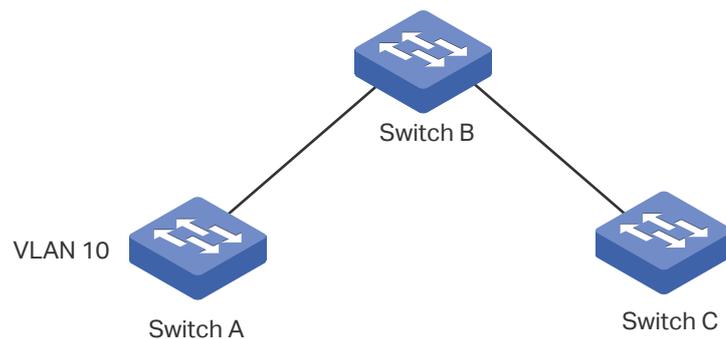
T1500G-8T v2 or above, T1500G-10PS v2 or above, T1500G-10MPS v2 or above, T1500-28PCT v3 or above, T1600G-18TS v2 or above, T1600G-28PS v3 or above, T1600G-28TS v3 or above, T1600G-52TS v3 or above, T1600G-52PS v3 or above, T1700X-16TS v3 or above, T2500G-10TS v2 or above, T2600G-18TS v2 or above, T2600G-28TS v3 or above, T2600G-28MPS v3 or above, T2600G-28SQ v1 or above, T2600G-52TS v3 or above.

# 1 Overview

GVRP (GARP VLAN Registration Protocol) is a GARP (Generic Attribute Registration Protocol) application that allows registration and deregistration of VLAN attribute values and dynamic VLAN creation.

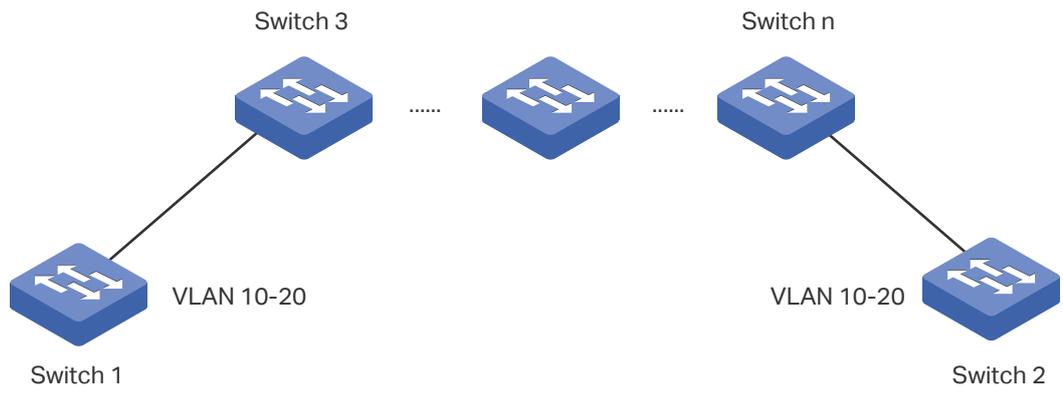
Without GVRP operating, configuring the same VLAN on a network would require manual configuration on each device. As shown in Figure 1-1, Switch A, B and C are connected through trunk ports. VLAN 10 is configured on Switch A, and VLAN 1 is configured on Switch B and Switch C. Switch C can receive messages sent from Switch A in VLAN 10 only when the network administrator has manually created VLAN 10 on Switch B and Switch C.

Figure 1-1 VLAN Topology



The configuration may seem easy in this situation. However, for a larger or more complex network, such manual configuration would be time-costing and fallible. GVRP can be used to implement dynamic VLAN configuration. With GVRP, the switch can exchange VLAN configuration information with the adjacent GVRP switches and dynamically create and manage the VLANs. This reduces VLAN configuration workload and ensures correct VLAN configuration.

Figure 1-2 GVRP Topology



# 2 GVRP Configuration

To complete GVRP configuration, follow these steps:

- 1) Create a VLAN.
- 2) Enable GVRP globally.
- 3) Enable GVRP on each port and configure the corresponding parameters.

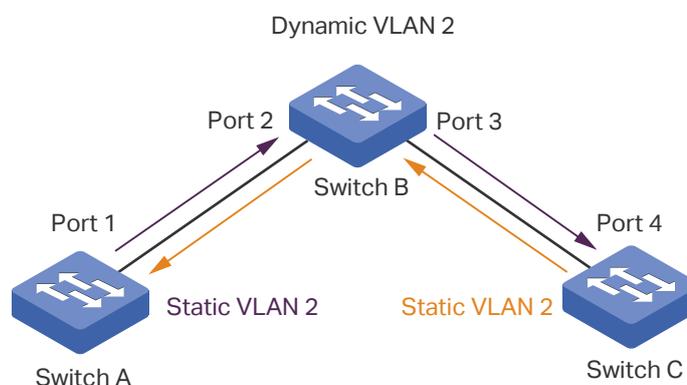
## Configuration Guidelines

To dynamically create a VLAN on all ports in a network link, you must configure the same static VLAN on both ends of the link.

We call manually configured 802.1Q VLAN as static VLAN and VLAN created through GVRP as dynamic VLAN. Ports in a static VLAN can initiate the sending of GVRP registration message to other ports. And a port registers VLANs only when it receives GVRP messages. As the messages can only be sent from one GVRP participant to another, two-way registration is required to configure a VLAN on all ports in a link. To implement two-way registration, you need to manually configure the same static VLAN on both ends of the link.

As shown in the figure below, VLAN registration from Switch A to Switch C adds Port 2 to VLAN 2. And VLAN registration from Switch C to Switch A adds Port 3 to VLAN 2.

Figure 2-1



Similarly, if you want to delete a VLAN from the link, two-way deregistration is required. And you need to manually delete the static VLAN on both ends of the link.

## 2.1 Using the GUI

Choose the menu **L2 FEATURES > VLAN > GVRP > GVRP Config** to load the following page.

Figure 2-2 GVRP Config

**GVRP**

GVRP:  Enable Apply

---

**Port Config**

UNIT1

LAGS

<input type="checkbox"/>	Port	Status	Registration Mode	LeaveAll Timer (1000-30000 centiseconds)	Join Timer (20- 1000 centiseconds)	Leave Timer (60- 3000 centiseconds)	LAG
<input checked="" type="checkbox"/>	1/0/1	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/2	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/3	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/4	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/5	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/6	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/7	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/8	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/9	Disabled	Normal	1000	20	60	--
<input type="checkbox"/>	1/0/10	Disabled	Normal	1000	20	60	--

Total: 28
1 entry selected.

Cancel
Apply

Follow these steps to configure GVRP:

- 1) In the **GVRP** section, enable GVRP globally, then click **Apply**.
- 2) In the **Port Config** section, select one or more ports, set the status as Enable and configure the related parameters according to your needs.

<b>Port</b>	Select the desired port for GVRP configuration. It is multi-optional.
<b>Status</b>	Enable or disable GVRP on the port. By default, it is disabled.
<b>Registration Mode</b>	Select the GVRP registration mode for the port. <p><b>Normal:</b> In this mode, the port can dynamically register and deregister VLANs, and transmit both dynamic and static VLAN registration information.</p> <p><b>Fixed:</b> In this mode, the port is unable to dynamically register and deregister VLANs, and can transmit only the static VLAN registration information.</p> <p><b>Forbidden:</b> In this mode, the port is unable to dynamically register and deregister VLANs, and can transmit only information of VLAN 1.</p>

LeaveAll Timer (centisecond)	When a GARP participant is enabled, the LeaveAll timer will be started. When the LeaveAll timer expires, the GARP participant will send LeaveAll messages to request other GARP participants to re-register all its attributes. After that, the participant restarts the LeaveAll timer.
	The timer ranges from 1000 to 30000 centiseconds. The default value is 1000 centiseconds.
Join Timer (centisecond)	Join timer controls the sending of Join messages. A GVRP participant starts the Join timer after sending the first Join message. If the participant does not receive any response, it will send the second Join message when the Join timer expires to ensure that the Join message can be sent to other participants.
	The timer ranges from 20 to 1000 centiseconds. The default value is 20 centiseconds.
Leave Timer (centisecond)	The Leave timer controls attribute deregistration. A participant will send a Leave message if it wants other participants to deregister some of its attributes. The participant receiving the message starts the Leave timer. If the participant does not receive any Join message of the corresponding attribute before the Leave timer expires, the participant deregisters the attribute.
	The timer ranges from 60 to 3000 centiseconds. The default value is 60 centiseconds.
LAG	Displays the LAG the port is in.

### 3) Click **Apply**.

#### Note:

- The member port of an LAG follows the configuration of the LAG and not its own. The configurations of the port can take effect only after it leaves the LAG.
- The egress rule of the ports dynamically added to the VLAN is tagged.
- The egress rule of the fixed port should be tagged.
- When setting the timer values, make sure the values are within the required range. The configuration value for LeaveAll should be greater than or equal to ten times the Leave value. The value for Leave should be greater than or equal to two times the Join value.

## 2.2 Using the CLI

Step 1	<b>configure</b>
	Enter global configuration mode.
Step 2	<b>gvrp</b>
	Enable GVRP globally.

---

Step 3	<b>interface {fastEthernet <i>port</i>   range fastEthernet <i>port-list</i>   gigabitEthernet <i>port</i>   range gigabitEthernet <i>port-list</i>   ten-gigabitEthernet <i>port</i>   range ten-gigabitEthernet <i>port-list</i>   port-channel <i>port-channel-id</i>   range port-channel <i>port-channel-list</i>}</b> Enter interface configuration mode.
Step 4	<b>gvrp</b> Enable GVRP on the port.
Step 5	<b>gvrp registration { normal   fixed   forbidden }</b> Configure the GVRP registration mode for the port. By default, it is normal.  <b>normal:</b> In this mode, the port can dynamically register and deregister VLANs, and transmit both dynamic and static VLAN registration information.  <b>fixed:</b> In this mode, the port is unable to dynamically register and deregister VLANs, and can transmit only the static VLAN registration information.  <b>forbidden:</b> In this mode, the port is unable to dynamically register and deregister VLANs, and can transmit only information of VLAN 1.
Step 6	<b>gvrp timer { leaveall   join   leave } <i>value</i></b> Set the GARP timers according to your needs.  <b>leaveall:</b> When a GARP participant is enabled, the LeaveAll timer will be started. When the LeaveAll timer expires, the GARP participant will send LeaveAll messages to request other GARP participants to re-register all its attributes. After that, the participant restarts the LeaveAll timer.  <b>join:</b> Join timer controls the sending of Join messages. A GVRP participant starts the Join timer after sending the first Join message. If the participant does not receive any response, it will send the second Join message when the Join timer expires to ensure that the Join message can be sent to other participants.  <b>leave:</b> The Leave timer controls attribute deregistration. A participant will send a Leave message if it wants other participants to deregister some of its attributes. The participant receiving the message starts the Leave timer. If the participant does not receive any Join message of the corresponding attribute before the Leave timer expires, the participant deregisters the attribute.  <b>value:</b> Set a value for the timer. For LeaveAll timer, the valid values are from 1000 to 30000 centiseconds and the default value is 1000 centiseconds. For Join timer, the valid values are from 20 to 1000 centiseconds and the default value is 20 centiseconds. For Leave timer, the valid values are from 60 to 3000 centiseconds and the default value is 60 centiseconds.
Step 7	<b>show gvrp global</b> Verify the global configurations of GVRP.
Step 8	<b>show gvrp interface [ fastEthernet <i>port</i>   gigabitEthernet <i>port</i>   ten-gigabitEthernet <i>port</i>   port-channel <i>port-channel-id</i> ]</b> Verify the GVRP configuration of the specified port or LAG.

---

- 
- Step 9      **end**  
Return to privileged EXEC mode.
- 
- Step 10     **copy running-config startup-config**  
Save the settings in the configuration file.
- 

 **Note:**

- The member port of an LAG follows the configuration of the LAG and not its own. The configurations of the port can take effect only after it leaves the LAG.
  - The egress rule of the ports dynamically added to the VLAN is tagged.
  - The egress rule of the fixed port should be tagged.
  - When setting the timer values, make sure the values are within the required range. The value for LeaveAll should be greater than or equal to ten times the Leave value. The value for Leave should be greater than or equal to two times the Join value.
- 

The following example shows how to enable GVRP globally and on port 1/0/1, configure the GVRP registration mode as fixed and keep the values of timers as default:

**Switch#configure**

**Switch(config)#gvrp**

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

**Switch(config-if)#gvrp**

**Switch(config-if)#gvrp registration fixed**

**Switch(config-if)#show gvrp global**

GVRP Global Status

-----

Enabled

**Switch(config-if)# show gvrp interface gigabitEthernet 1/0/1**

Port	Status	Reg-Mode	LeaveAll	JoinIn	Leave	LAG
----	-----	-----	-----	-----	-----	---
Gi1/0/1	Enabled	Fixed	1000	20	60	N/A

**Switch(config-if)#end**

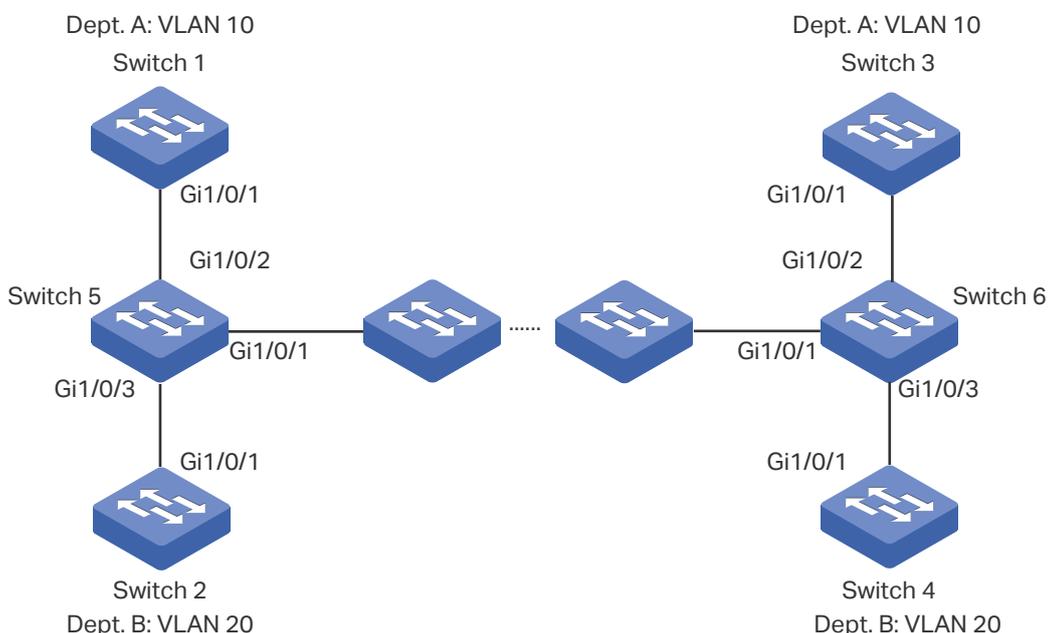
**Switch#copy running-config startup-config**

# 3 Configuration Example

## 3.1 Network Requirements

Department A and Department B of a company are connected using switches. Offices of one department are distributed on different floors. As shown in Figure 3-1, the network topology is complicated. Configuration of the same VLAN on different switches is required so that computers in the same department can communicate with each other.

Figure 3-1 Network Topology



## 3.2 Configuration Scheme

To reduce manual configuration and maintenance workload, GVRP can be enabled to implement dynamic VLAN registration and update on the switches.

When configuring GVRP, please note the following:

- The two departments are in separate VLANs. To make sure the switches only dynamically create VLAN of their own department, you need to set the registration mode for ports on Switch 1 to Switch 4 as Fixed to prevent dynamic registration and deregistration of VLANs and allow the port to transmit only the static VLAN registration information.
- To configure dynamic VLAN creation on other switches, set the registration mode of the corresponding ports as Normal to allow dynamic registration and deregistration of VLANs.

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

### 3.3 Using the GUI

GVRP configuration for Switch 3 is the same as Switch 1, and Switch 4 the same as Switch 2. Other switches share similar configurations.

The following configuration procedures take Switch 1, Switch 2 and Switch 5 as example.

#### ■ Configurations for Switch 1

- 1) Choose the menu **L2 FEATURES > VLAN > 802.1Q VLAN > VLAN Config** and click **+ Add** to load the following page. Create VLAN 10 and add tagged port 1/0/1 to it. Click **Create**.

Figure 3-2 Create VLAN 10

**VLAN Config**

VLAN ID:  (2-4094, format: 2,4-5,8)

VLAN Name:  (1-16 characters)

Untagged Ports

Port:  (Format: 1/0/1, input or choose below)

Select All

UNIT1												LAGS					
<input type="checkbox"/>																	
<input type="checkbox"/>																	

Selected     Unselected     Not Available

Tagged Ports

Port:  (Format: 1/0/1, input or choose below)

Select All

UNIT1												LAGS					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>																

Selected     Unselected     Not Available

- 2) Choose the menu **L2 FEATURES > VLAN > GVRP** to load the following page. Enable GVRP globally, then click **Apply**. Select port 1/0/1, set Status as Enable, and set Registration Mode as Fixed. Keep the values of the timers as default. Click **Apply**.

Figure 3-3 GVRP Configuration

GVRP

GVRP:  Enable **Apply**

Port Config

UNIT1		LAGS		LeaveAll Timer (1000-30000 centiseconds)	Join Timer (20- 1000 centiseconds)	Leave Timer (60- 3000 centiseconds)	LAG
<input type="checkbox"/>	Port	Status	Registration Mode				
<input checked="" type="checkbox"/>	1/0/1	Enabled	Fixed	1000	20	60	---
<input type="checkbox"/>	1/0/2	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/3	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/4	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/5	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/6	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/7	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/8	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/9	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/10	Disabled	Normal	1000	20	60	---

Total: 28 1 entry selected. **Cancel** **Apply**

- 3) Click  **Save** to save the settings.

■ **Configurations for Switch 2**

- 4) Choose the menu **L2 FEATURES > VLAN > 802.1Q VLAN > VLAN Config** and click  **Add** to load the following page. Create VLAN 20 and add tagged port 1/0/1 to it. Click **Create**.

Figure 3-4 Create VLAN 20

VLAN Config

VLAN ID:  (2-4094, format: 2,4-5,8)

VLAN Name:  (1-16 characters)

---

Untagged Ports

Port:  (Format: 1/0/1, input or choose below)

UNIT1
LAGS

Select All

2

4

6

8

10

12

14

16

18

20

22

24

26

28

1

3

5

7

9

11

13

15

17

19

21

23

25

27

Selected

Unselected

Not Available

---

Tagged Ports

Port:  (Format: 1/0/1, input or choose below)

UNIT1
LAGS

Select All

2

4

6

8

10

12

14

16

18

20

22

24

26

28

1

3

5

7

9

11

13

15

17

19

21

23

25

27

Selected

Unselected

Not Available

Cancel

Create

- 5) Choose the menu **L2 FEATURES > VLAN > GVRP** to load the following page. Enable GVRP globally, then click **Apply**. Select port 1/0/1, set Status as Enable, and set Registration Mode as Fixed. Keep the values of the timers as default. Click **Apply**.

Figure 3-5 GVRP Configuration

GVRP

GVRP:  Enable

Port Config

UNIT1		LAGS		LeaveAll Timer (1000-30000 centiseconds)	Join Timer (20- 1000 centiseconds)	Leave Timer (60- 3000 centiseconds)	LAG
<input type="checkbox"/>	Port	Status	Registration Mode				
<input checked="" type="checkbox"/>	1/0/1	Enabled	Fixed	1000	20	60	---
<input type="checkbox"/>	1/0/2	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/3	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/4	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/5	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/6	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/7	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/8	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/9	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/10	Disabled	Normal	1000	20	60	---

Total: 28 1 entry selected.

6) Click  Save to save the settings.

#### ■ Configurations for Switch 5

- 1) Choose the menu **L2 FEATURES > VLAN > GVRP** to load the following page. Enable GVRP globally, then click **Apply**. Select ports 1/0/1-3, set Status as Enable, and keep the Registration Mode and the values of the timers as default. Click **Apply**.

Figure 3-6 GVRP Configuration

GVRP

GVRP:  Enable

Port Config

UNIT1		LAGS		LeaveAll Timer (1000-30000 centiseconds)	Join Timer (20- 1000 centiseconds)	Leave Timer (60- 3000 centiseconds)	LAG
<input type="checkbox"/>	Port	Status	Registration Mode				
		Enable					
<input checked="" type="checkbox"/>	1/0/1	Enabled	Normal	1000	20	60	---
<input checked="" type="checkbox"/>	1/0/2	Enabled	Normal	1000	20	60	---
<input checked="" type="checkbox"/>	1/0/3	Enabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/4	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/5	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/6	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/7	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/8	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/9	Disabled	Normal	1000	20	60	---
<input type="checkbox"/>	1/0/10	Disabled	Normal	1000	20	60	---

Total: 28 3 entries selected.

- 2) Click  Save to save the settings.

### 3.4 Using the CLI

GVRP configuration for Switch 3 is the same as Switch 1, and Switch 4 the same as Switch 2. Other switches share similar configurations.

The following configuration procedures take Switch 1, Switch 2 and Switch 5 as example.

#### ■ Configurations for Switch 1

- 1) Enable GVRP globally.

```
Switch_1#configure
```

```
Switch_1(config)#gvrp
```

- 2) Create VLAN 10.

```
Switch_1(config)#vlan 10
```

```
Switch_1(config-vlan)#name Department A
```

```
Switch_1(config-vlan)#exit
```

- 3) Add tagged port 1/0/1 to VLAN 10. Enable GVRP on port and set the registration mode as Fixed.

```
Switch_1(config)#interface gigabitEthernet 1/0/1
Switch_1(config-if)#switchport general allowed vlan 10 tagged
Switch_1(config-if)#gvrp
Switch_1(config-if)#gvrp registration fixed
Switch_1(config-if)#end
Switch_1#copy running-config startup-config
```

#### ■ Configurations for Switch 2

- 1) Enable GVRP globally.

```
Switch_2#configure
Switch_2(config)#gvrp
```

- 2) Create VLAN 20.

```
Switch_2(config)#vlan 20
Switch_2(config-vlan)#name Department B
Switch_2(config-vlan)#exit
```

- 3) Add tagged port 1/0/1 to VLAN 20. Enable GVRP on the port and set the registration mode as Fixed.

```
Switch_2(config)#interface gigabitEthernet 1/0/1
Switch_2(config-if)#switchport general allowed vlan 20 tagged
Switch_2(config-if)#gvrp
Switch_2(config-if)#gvrp registration fixed
Switch_2(config-if)#end
Switch_2#copy running-config startup-config
```

#### ■ Configurations for Switch 5

- 1) Enable GVRP globally.

```
Switch_5#configure
Switch_5(config)#gvrp
```

- 2) Enable GVRP on ports 1/0/1-3.

```
Switch_5(config)#interface range gigabitEthernet 1/0/1-3
Switch_5(config-if-range)#gvrp
Switch_5(config-if-range)#end
```

```
Switch_5#copy running-config startup-config
```

## Verify the Configuration

### Switch 1

Verify the global GVRP configuration:

```
Switch_1#show gvrp global
```

```
GVRP Global Status
```

```
-----
```

```
Enabled
```

Verify GVRP configuration for port 1/0/1:

```
Switch_1#show gvrp interface
```

Port	Status	Reg-Mode	LeaveAll	JoinIn	Leave	LAG
----	-----	-----	-----	-----	-----	---
Gi1/0/1	Enabled	Fixed	1000	20	60	N/A
Gi1/0/2	Disabled	Normal	1000	20	60	N/A

```
.....
```

### Switch 2

Verify the global GVRP configuration:

```
Switch_2#show gvrp global
```

```
GVRP Global Status
```

```
-----
```

```
Enabled
```

Verify GVRP configuration for port 1/0/1:

```
Switch_2#show gvrp interface
```

Port	Status	Reg-Mode	LeaveAll	JoinIn	Leave	LAG
----	-----	-----	-----	-----	-----	---
Gi1/0/1	Enabled	Fixed	1000	20	60	N/A
Gi1/0/2	Disabled	Normal	1000	20	60	N/A

.....

- Switch 5

Verify global GVRP configuration:

GVRP Global Status

-----

Enabled

Verify GVRP configuration for ports 1/0/1-3:

Switch\_5#show gvrp interface

Port	Status	Reg-Mode	LeaveAll	JoinIn	Leave	LAG
----	-----	-----	-----	-----	-----	---
Gi1/0/1	Enabled	Normal	1000	20	60	N/A
Gi1/0/2	Enabled	Normal	1000	20	60	N/A
Gi1/0/3	Enabled	Normal	1000	20	60	N/A
Gi1/0/4	Disabled	Normal	1000	20	60	N/A

.....

# 4 Appendix: Default Parameters

Default settings of GVRP are listed in the following tables.

Table 4-1 Default Settings of GVRP

Parameter	Default Setting
Global Config	
GVRP	Disabled
Port Config	
Status	Disabled
Registration Mode	Normal
LeaveAll Timer	1000 centiseconds
Join Yimer	20 centiseconds
Leave Timer	60 centiseconds