User Guide

Industrial Easy Managed Switch

CONTENTS

Configuring VLAN

Configuring QoS

Monitoring

Configuring STP/RSTP

System Tools

Configuring Alert

Controller Settings

Configuring PoE (Only for Certain Devices)

About This Guide

This Configuration Guide provides information for configuring the Easy Managed Switch via the web interface. Read this guide carefully before operation.

You can also configure and manage the switch using the Omada Controller. For more information, refer to the **Omada SDN Controller User Guide**. Go to the website *https://support.omadanetworks.com/*, search Omada SDN Controller, and you can find the guide on the product Support web page.

Intended Readers

This Guide is intended for network managers familiar with IT concepts and network terminologies.

Conventions

When using this guide, notice that features available in Industrial Easy Managed Switch may vary by model and software version. The availability of Industrial Easy Managed Switch may also vary by region or Service Provider. All images, steps, and descriptions in this guide are only examples and may not reflect your actual experience. Throughout the guide, we will take a specific model as the switch to be configured for example.

For local sales information, visit *https://www.omadanetworks.com/*.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information and recommendations in this document do not constitute the warranty of any kind, express or implied. Users must take full responsibility for their application of any products.

In this Guide, the following conventions are used:

Note contains suggestions or references that help you make better use of your device.

Bold font indicates a button, toolbar icon, menu or menu item.

Menu Name > Submenu Name > Tab page indicates the menu structure. **SYSTEM > System Info > System Summary** means the System Summary page under the System Info menu option that is located under the SYSTEM menu.

More Resources

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Part 1

Introduction

CHAPTERS

1 Product Overview

Omada Industrial Easy Managed Switch is designed for harsh environments. The functions that can be configured in the standalone mode include (but not limited to):

- Traffic monitoring: Traffic summary, port mirroring, loop prevention and cable test enable the administrator to monitor traffic of the network effectively.
- VLAN: MTU VLAN, Port-based VLAN and 802.1Q VLAN can restrict broadcast domain, enhance network security and help manage devices easily.
- QoS: Port-based QoS, 802.1P-based QoS and DSCP/802.1P based QoS optimize traffic on your business network, and keep latency-sensitive traffic moving smoothly. Rate limit helps distribute and utilize network bandwidth reasonably. Storm control helps avoid network broadcast storm.
- Alert: Alert notifies administrators of power supply issues and port status changes. The function can help administrators quickly identify and address potential problems, ensuring network reliability and minimizing downtime.
- PoE: PoE (Power over Ethernet) is a remote power supply function. With this function, the switch can supply power to the connected devices over twisted-pair cables.

Note:

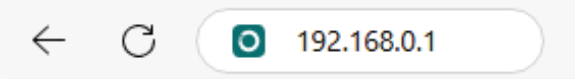
The PoE Config is only available on PoE models of Industrial Easy Managed Switch series. For non-PoE models, this feature is not supported. For detailed specifications, refer to the product datasheet.

2 Logging Into the Switch

To configure your switch through a web browser on your PC, follow these steps:

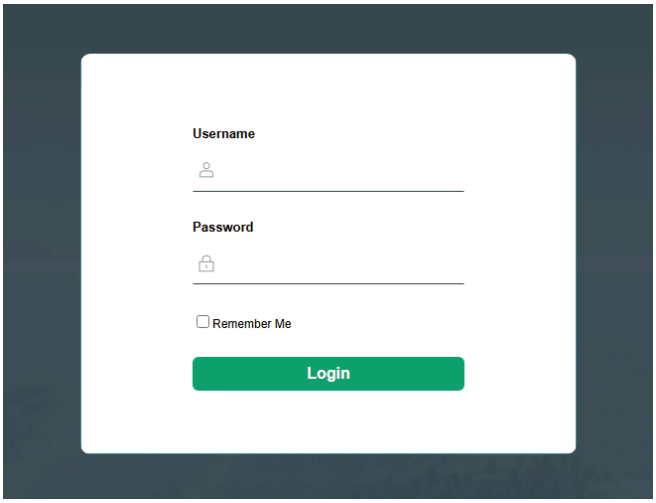
1) Connect your switch to the network and connect your PC to the switch.
2) Find out the IP address of the switch.
   - By default, the switch receives an IP address from a DHCP server (or a router that functions as a DHCP server) in your network. You can find out this IP address on the DHCP server.
   - If the switch cannot receive an IP address from a DHCP server, it uses the static IP address of 192.168.0.1, with a subnet mask of 255.255.255.0.
3) Configure IP address on your PC to make sure the switch and PC are in the same subnet.
   - If the switch uses an IP address assigned by a DHCP server, set your PC to obtain an IP address automatically from the DHCP server.
   - If the switch uses the static IP address of **192.168.0.1**, configure your PC's IP address as **192.168.0.x** ("x" ranges from 2 to 254), and subnet mask as **255.255.255.0**.
4) Launch a web browser on your PC. The supported web browsers include, but are not limited to, the following types:
   - Edge 134.0.3124.51
   - Chrome 135.0.7039.0
   - Firefox 136.0
   - Safari 15.6.1
5) In the address bar of the web browser, enter the IP address of the switch. Here we suppose the switch uses the static IP address **192.168.0.1**.

Figure 2-1 Entering the IP Address of the Switch in the Browser



6) Enter the username and password in the pop-up login window. Enter **admin** for both username and password in lower case letters.

Figure 2-2 Logging Into the Switch

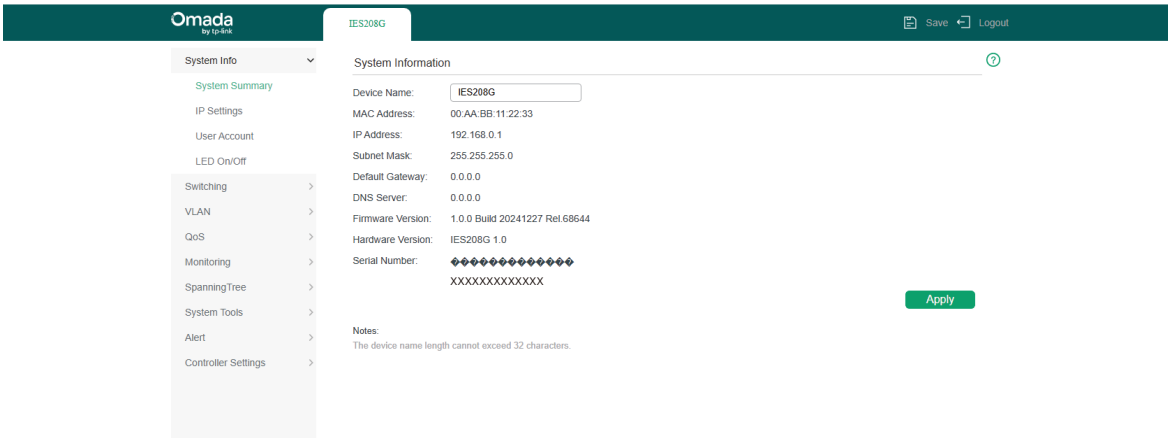


Note:

The first time you log in, you have to change the password to better protect your network and devices.

7) The typical web interface displays below. You can view the running status of the switch and configure the switch on this interface.

Figure 2-3 Launching the Web Interface



Note:

After applying the settings, you need to click the Save button on the upper right of the page to put the configuration into effect.

Part 2

Managing System

CHAPTERS

1 System

1.1 Overview

In the System Info module, you can view the system information and configure the system parameters and features of the switch.

1.2 Supported Features

System Summary

System Summary is mainly used to view the system information and configure the device name.

IP Settings

Each device in the network possesses a unique IP address. You can access the switch using IP address of the switch. You can set IP address of the switch manually or using DHCP.

User Account

User Account is mainly used to modify the administrator's username and password in order to refuse illegal users.

LED On/Off

LED On/Off config is used to turn on or off the LED on the switch.

2 System Summary

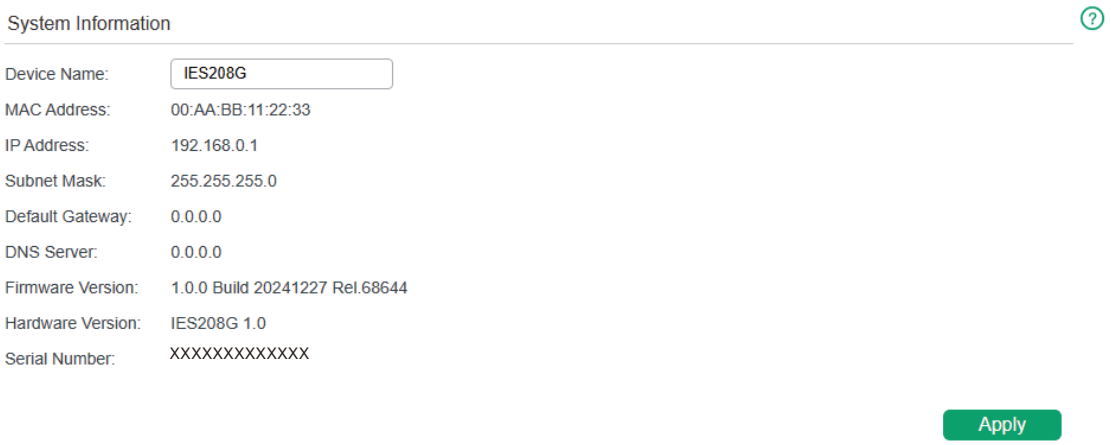
With System Summary, you can:

- View the system information
- Specify the device name

2.1 Viewing the System Information

Choose the menu **System Info** > **System Summary** to load the following page. You can view the basic system information of the switch.

Figure 2-1 Viewing the System Summary



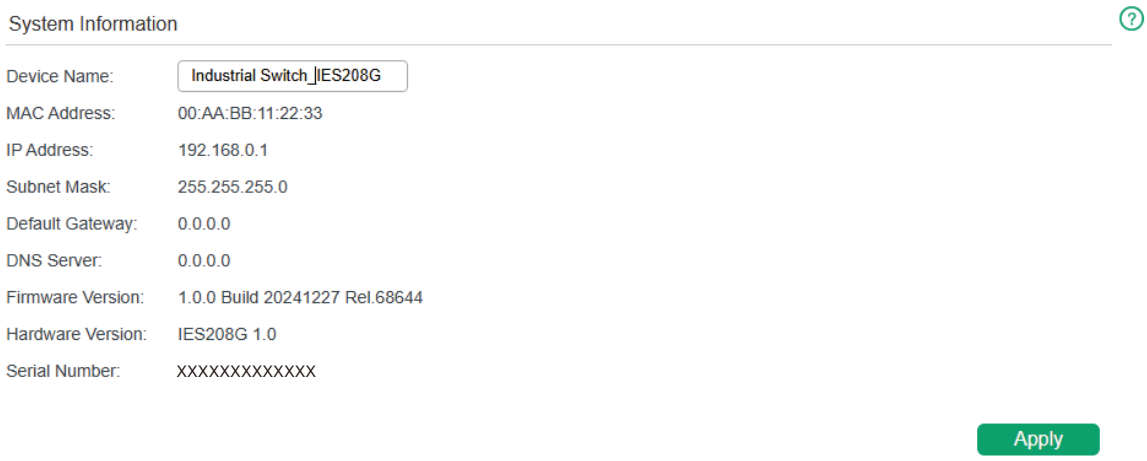
Note:

The Serial Number of the switch can be used to add the device to the Omada Cloud-Based Controller.

2.2 Specifying the Device Name

Choose the menu **System Info** > **System Summary** to load the following page. Specify a new device name for the switch, and click **Apply**.

Figure 2-2 Specifying the Device Name



Note:

The length of the device name cannot exceed 32 characters.

3 Configuring IP

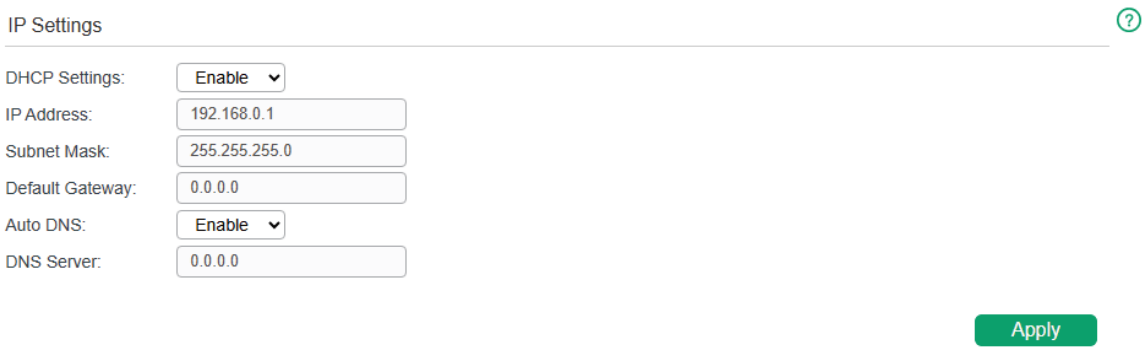
You can configure the system IP address in the following two ways:

- Configure the System IP Address Using DHCP
- Configure the System IP Address Manually

Configuring the System IP Address Using DHCP

Choose the menu **System Info** > **IP Settings** to load the following page.

Figure 3-1 Configuring System IP Address Using DHCP



Follow these steps to configure the system IP address using DHCP:

1) Select DHCP Settings as **Enable** from the drop-down list.
2) Configure Auto DNS.

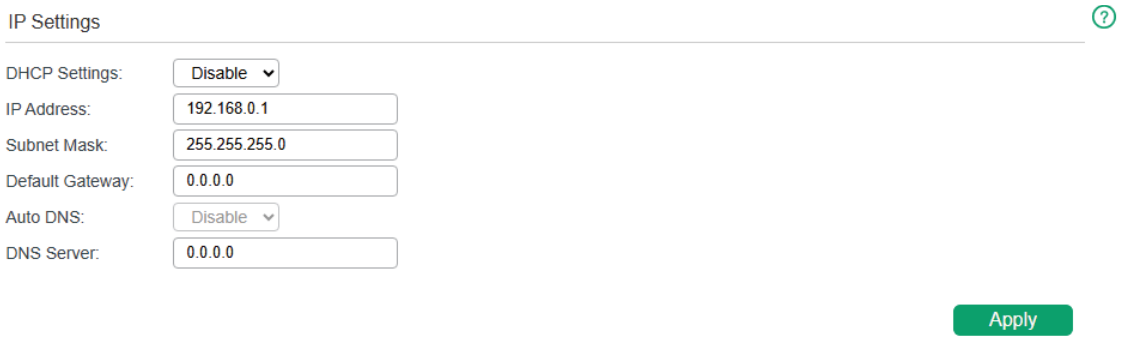
   a) Select Auto DNS as **Enable** from the drop-down list. The switch will obtain the DNS server's IP address from the DHCP Server.

   b) Select Auto DNS as **Disable** from the drop-down list. You can specify the DNS server's IP address of the switch.
3) Click **Apply**. The switch will obtain IP settings from the DHCP server.

Configuring the System IP Address Manually

Choose the menu **System Info** > **IP Settings** to load the following page.

Figure 3-2 Configuring System IP Address Manually



Follow these steps to configure the system IP address manually:

1) Select DHCP Settings as **Disable** from the drop-down list.
2) Specify the IP address, subnet mask, default gateway and DNS server.

IP Address	Specify the system IP of the switch. You can use this IP address to access the switch.
Subnet Mask	Specify the subnet mask of the switch.
Default Gateway	Specify the default gateway of the switch.
DNS Server	Specify the DNS server's IP address of the switch.

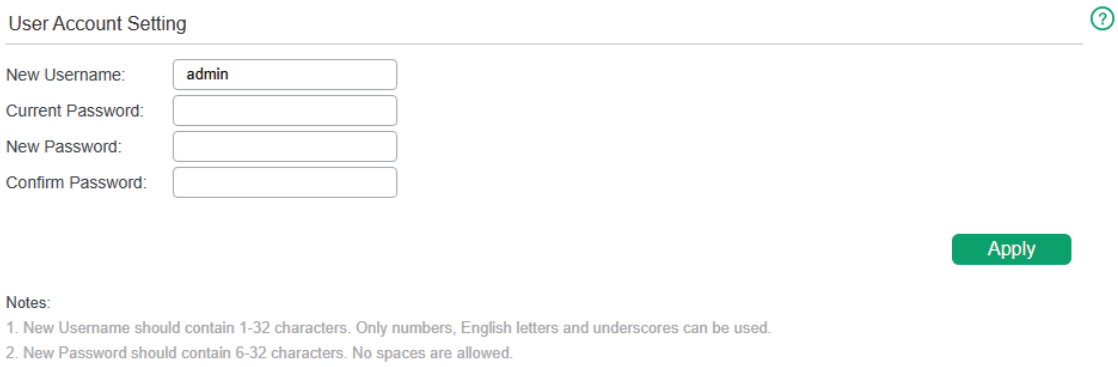
3) Click **Apply**.

4 Configuring User Account

With User Account, you can modify the administrator's username and password in order to refuse illegal users.

Choose the menu **System Info > User Account** to load the following page.

Figure 4-1 Configuring User Account



Follow these steps to configure the user account:

1) Specify the new username, enter the current password, specify a new password and confirm the new password.

New Username	Create a user name for login. Requirement for the user name varies among different devices. If your user name fails to meet the requirement, check the prompt information.
Current Password	Enter the current password of the switch.
New Password	Specify a new password for login. Requirement for the password varies among different devices. If your password fails to meet the requirement, check the prompt information.
Confirm Password	Retype the new password.

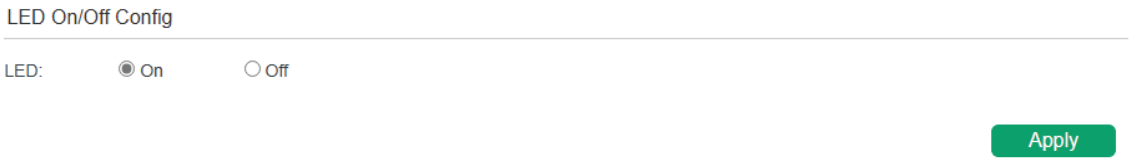
2) Click **Apply**.

5 Configuring LED

With this function, you can turn on or turn off the LED with one click.

Choose the menu **System Info > LED On/Off** to load the following page. Choose the LED status and click **Apply**.

Figure 5-1 Configuring LED On/Off



6 Appendix: Default Parameters

Default setting of System Summary is listed in the following table.

Table 6-1 Default Setting of System Summary

Parameter	Default Setting
Device Name	The model name of the switch.

Default settings of IP Settings are listed in the following table.

Table 6-2 Default Settings of IP Settings

Parameter	Default Setting
DHCP Setting	Enable
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
Auto DNS	Enable
DNS Server	0.0.0.0

Default setting of User Account is listed in the following table.

Table 6-3 Default Setting of User Account

Parameter	Default Setting
New Username	admin

Part 3

Switching

CHAPTERS

1 Switching

1.1 Overview

With the Switching feature, you can configure Port Settings, Digital Diagnostics Monitoring (DDM), IGMP Snooping and Link Aggregation Group (LAG).

1.2 Supported Features

The switch supports the following features about switching:

Port Settings

You can configure port state, speed, duplex mode and flow control for ports.

Digital Diagnostics Monitoring (DDM)

With the Digital Diagnostics Monitoring (DDM) function, you can monitor and manage the SFP modules inserted into the SFP ports. You can configure multiple thresholds for the SFP module. The SFP port can be automatically shut down when the switch detects the operating parameter of the module exceeds the threshold.

IGMP Snooping

In a point-to-multipoint network, packets can be sent in three ways: unicast, broadcast and multicast. With unicast, many copies of the same information will be sent to all the receivers, occupying a large bandwidth.

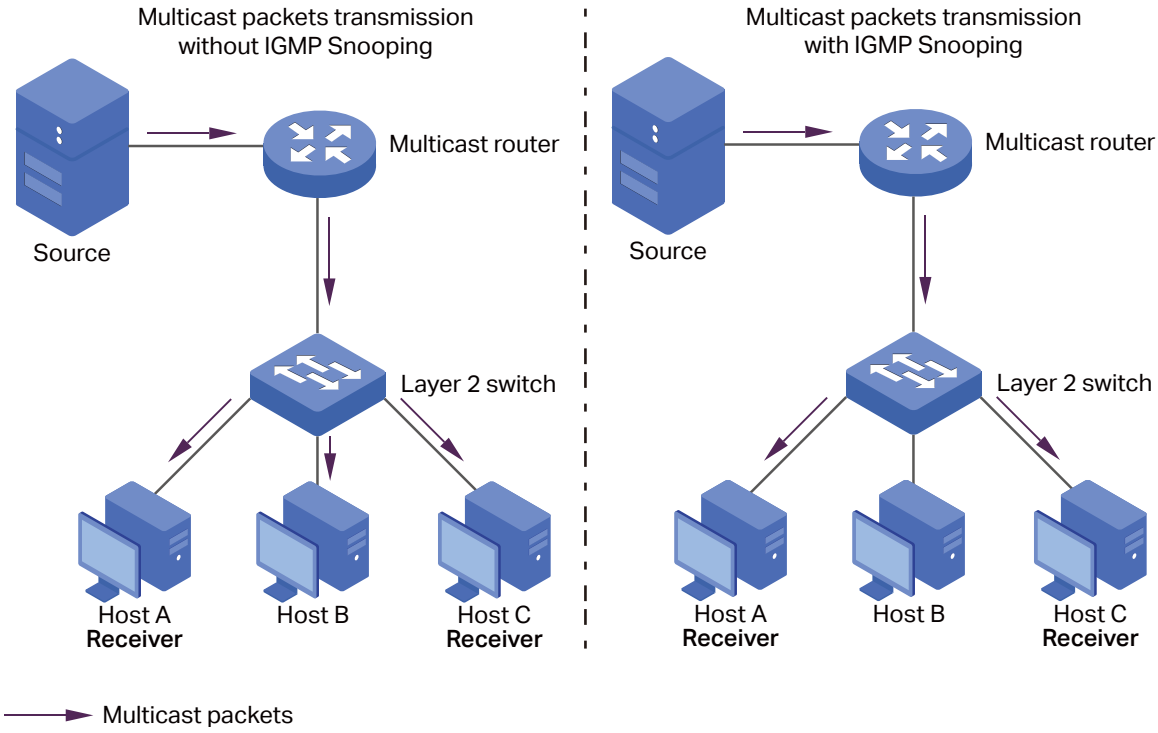
With broadcast, information will be sent to all users in the network no matter they need it or not, wasting network resources and impacting information security.

Multicast, however, solves all the problems caused by unicast and broadcast. With multicast, the source only needs to send one piece of information, and all and only the users who need the information will receive copies of the information. In a point-to-multipoint network, multicast technology not only transmits data with high efficiency, but also saves a large bandwidth and reduces network load.

When IGMP Snooping is disabled on the switch, multicast packets will be broadcast in the Layer 2 network; when IGMP Snooping is enabled on the switch, multicast

data from a known multicast group will be transmitted to the designated receivers instead of being broadcast in the Layer2 network. The following figure shows how IGMP snooping works.

Figure 1-1 IGMP Snooping



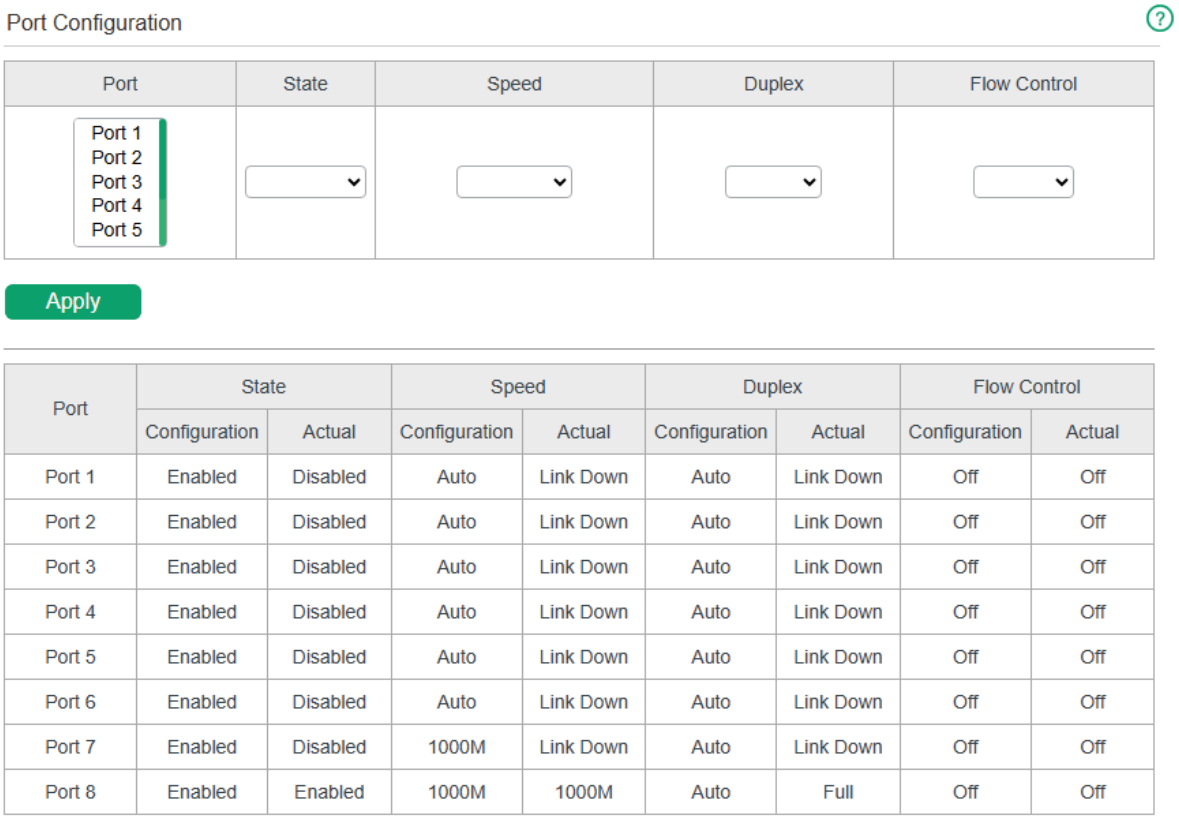
Link Aggregation Group (LAG)

With the Link Aggregation Group (LAG) function, you can aggregate multiple physical ports into a logical interface to increase link bandwidth and enhance the connection reliability.

2 Configuring Ports

Choose the menu **Switching > Port Settings** to load the following page.

Figure 2-1 Configuring Ports



Port	State		Speed		Duplex		Flow Control	
	Configuration	Actual	Configuration	Actual	Configuration	Actual	Configuration	Actual
Port 1	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 2	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 3	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 4	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 5	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 6	Enabled	Disabled	Auto	Link Down	Auto	Link Down	Off	Off
Port 7	Enabled	Disabled	1000M	Link Down	Auto	Link Down	Off	Off
Port 8	Enabled	Enabled	1000M	1000M	Auto	Full	Off	Off

Follow these steps to configure the port parameters.

1) Select the desired ports and set basic parameters for the ports.

State	Enable or disable the port. When **Enable** is selected, the port can forward the packets normally.
Speed	Select the speed mode for the port. You can select Auto or manually specify the speed mode. When **Auto** is selected, the speed mode will be automatically determined by auto-negotiation. The device connected to the port should be in the same speed mode as the port.

Duplex	Select the duplex mode for the port. You can select Auto or manually specify the duplex mode. When **Auto** is selected, the duplex mode will be automatically determined by auto-negotiation. The device connected to the port should be in the same duplex mode as the port.
Flow Control	Select **On** or **Off** to enable or disable the Flow Control feature. When **On** is selected, the switch can synchronize the speed with its peer to avoid the packet loss caused by congestion.

2) Click **Apply**.

Note:

- When rate/duplex of a port is set to auto/1000M, full duplex and its actual mode is 1000M full duplex/100M full duplex/10M full duplex, the flow control function can be enabled and take effect.
- It is recommended to set the ports on both ends of a link with the same speed and duplex mode.
- Keep the port that is connected to the management device enabled, or you cannot access the switch.
- The parameters of the port members in a LAG should be set as the same.

3 Configuring DDM

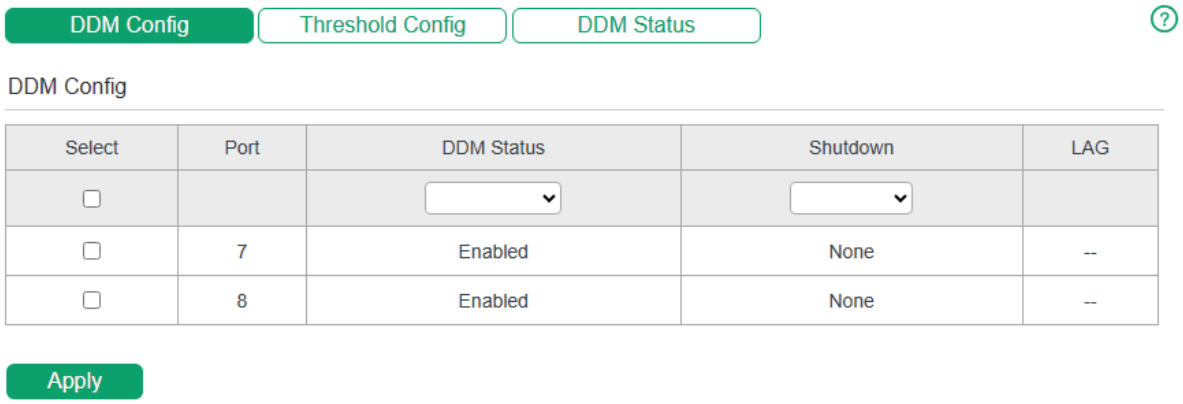
To configure DDM, follow these steps:

1) Enable DDM and set the shutdown condition.
2) Configure the DDM thresholds.
3) View the DDM status.

3.1 Enabling DDM and Setting Shutdown Condition

Choose the menu **Switching > DDM > DDM Config** to load the following page.

Figure 3-1 Configuring DDM



Follow these steps to configure DDM.

1) Select one or more SFP ports and enable DDM in the DDM Status drop-down list.
2) Set the shutdown condition for each SFP port. Click **Apply**.

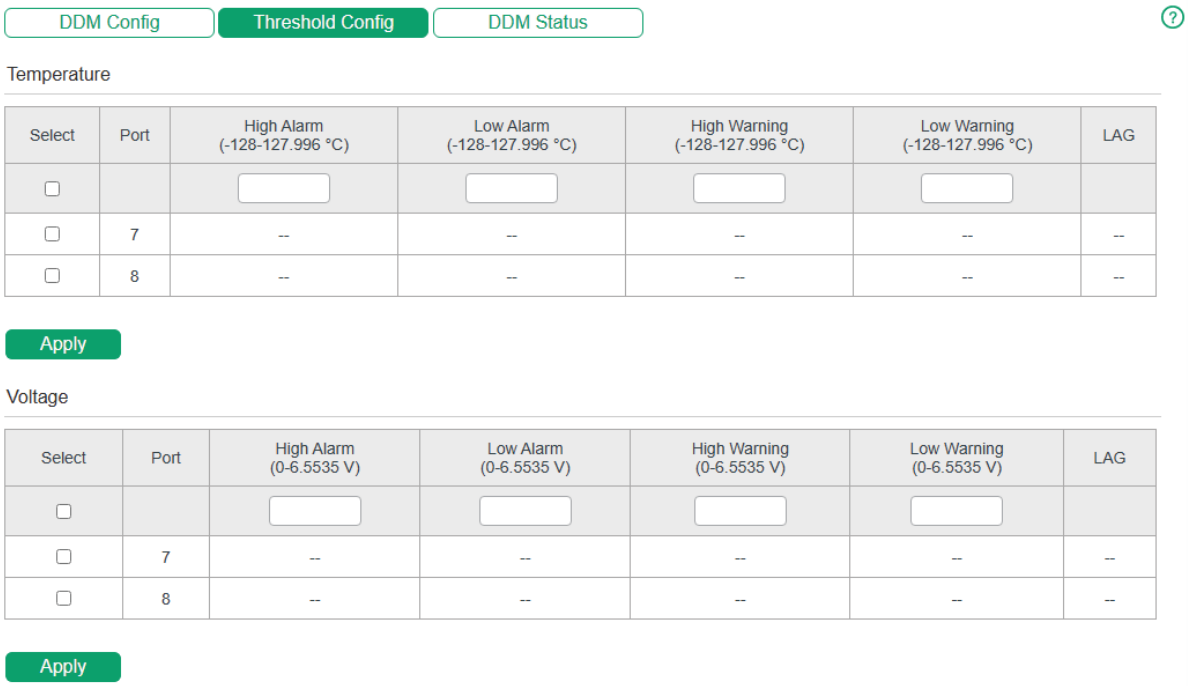
DDM Status	Displays the DDM status of each SFP port.

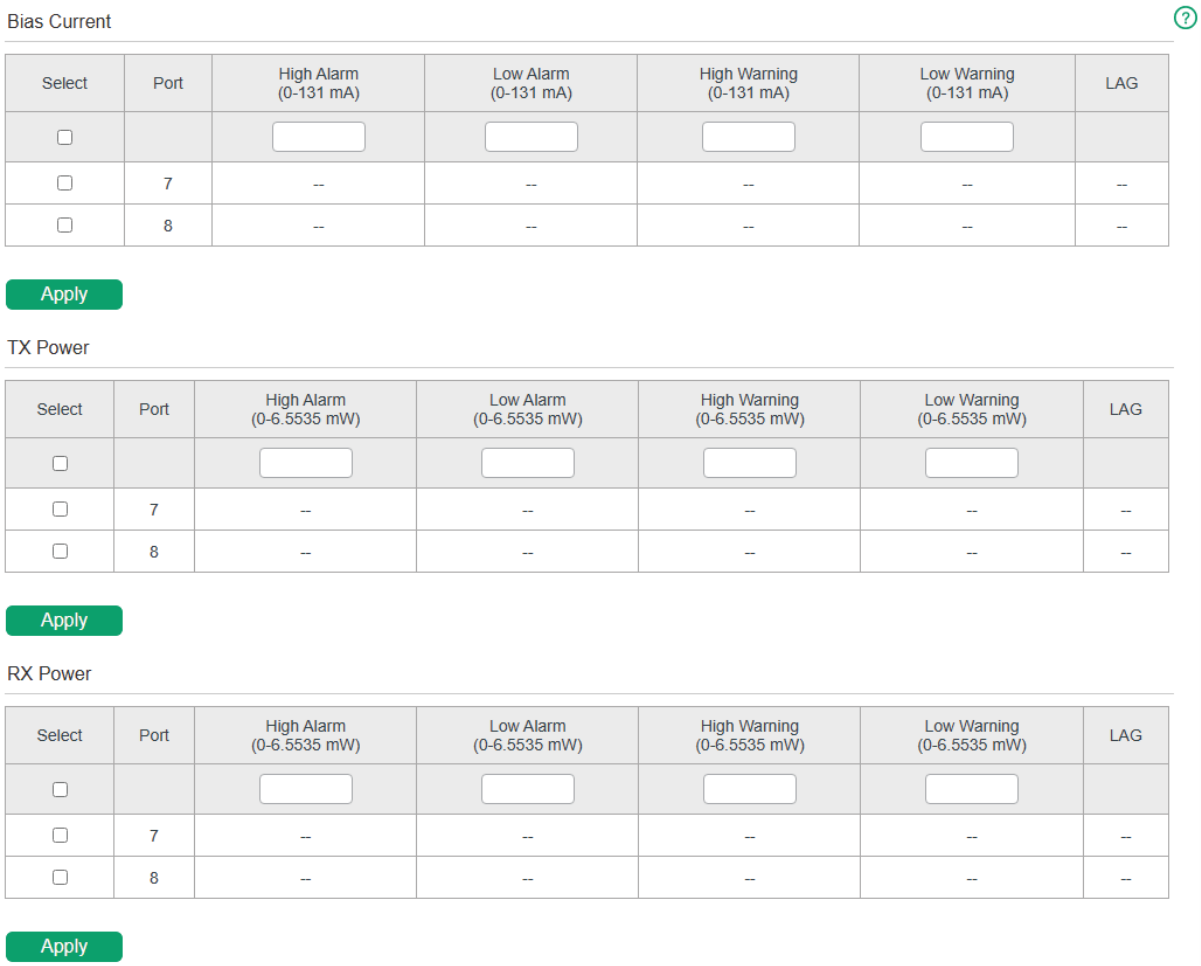
Shutdown	Displays the shutdown condition of each SFP port. None: The port will never be shut down regardless of whether the threshold ranges are exceeded or not. This is the default setting. Alarm: The port will be shut down when the configured alarm threshold range is exceeded. Warning: The port will be shut down when the configured warning threshold range is exceeded.
LAG	Displays the LAG that the port belongs to.

3.2 Configuring DDM Thresholds

Choose the menu **Switching > DDM > Threshold Config** to load the following page.

Figure 3-2 Configuring DDM Thresholds





Follow these steps to configure the DDM temperature / voltage / bias current / TX power / RX power thresholds for the SFP ports.

1) Select one or more SFP ports and specify the DDM threshold in the corresponding section.

2) Click **Apply**.

High Alarm	Specify the highest threshold for the alarm. When the operating parameter rises above this value, action associated with the alarm will be taken.
Low Alarm	Specify the lowest threshold for the alarm. When the operating parameter falls below this value, action associated with the alarm will be taken.
High Warning	Specify the highest threshold for the warning. When the operating parameter rises above this value, action associated with the warning will be taken.

Low Warning	Specify the lowest threshold for the warning. When the operating parameter falls below this value, action associated with the warning will be taken.
LAG	Displays the LAG that the port belongs to.

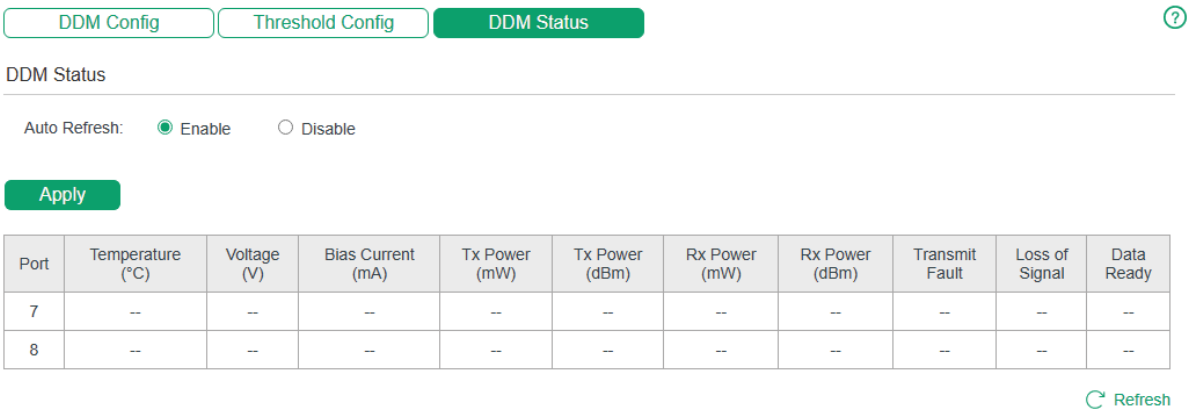
Note:

The value of threshold parameters should conform to the following rule: High Alarm ≥ High Warning ≥ Low Warning ≥ Low Alarm.

3.3 Viewing DDM status

Choose the menu **Switching > DDM > DDM Status** to load the following page. You can view the current working parameters of the SFP modules inserted into a SFP port.

Figure 3-3 Viewing DDM Status



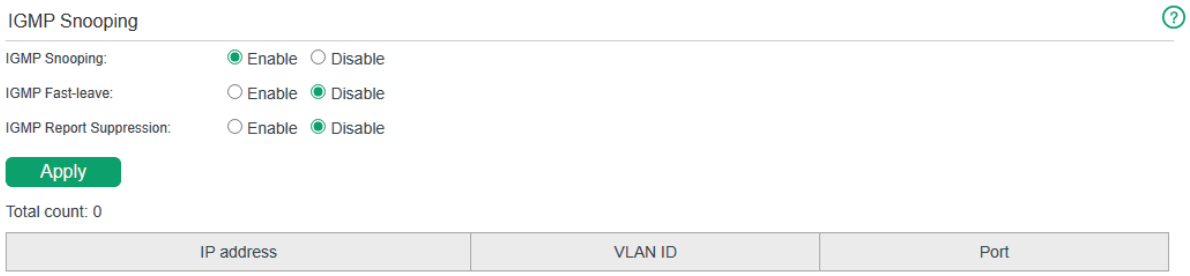
Auto Refresh	With this option enabled, the switch will automatically refresh the DDM status every 5 seconds.
Refresh	Click to manually refresh the DDM status.
Temperature	Displays the current temperature of the SFP module inserted into a specific port.
Voltage	Displays the current voltage of the SFP module inserted into a specific port.
Bias Current	Displays the current bias current of the SFP module inserted into a specific port.

Tx Power	Displays the current Tx power of the SFP module inserted into a specific port in mW and in dBm.
Rx Power	Displays the current Rx power of the SFP module inserted into a specific port in mW and in dBm.
Transmit Fault	Reports remote SFP module signal loss. The values are True, False and No Signal.
Loss of Signal	Reports local SFP module signal loss. The values are True and False.
Data Ready	Indicates whether the SFP module is operational. The values are True and False.

4 Configuring IGMP Snooping

Choose the menu **Switching > IGMP Snooping** to load the following page.

Figure 4-1 Configuring IGMP Snooping



Follow these steps to configure IGMP Snooping.

1) Enable IGMP Snooping. Enable or disable IGMP Fast-leave and report message suppression according to your needs. Click **Apply**.

IGMP Snooping	Enable or disable IGMP Snooping globally.
IGMP Fast-leave	Enable or disable Fast Leave globally.
IGMP Report Suppression	Enable or disable Report Message Suppression function globally. If this function is enabled, the first Report Message from the listener will forward to the router ports while the subsequent Report Message will be suppressed to reduce the IGMP packets.

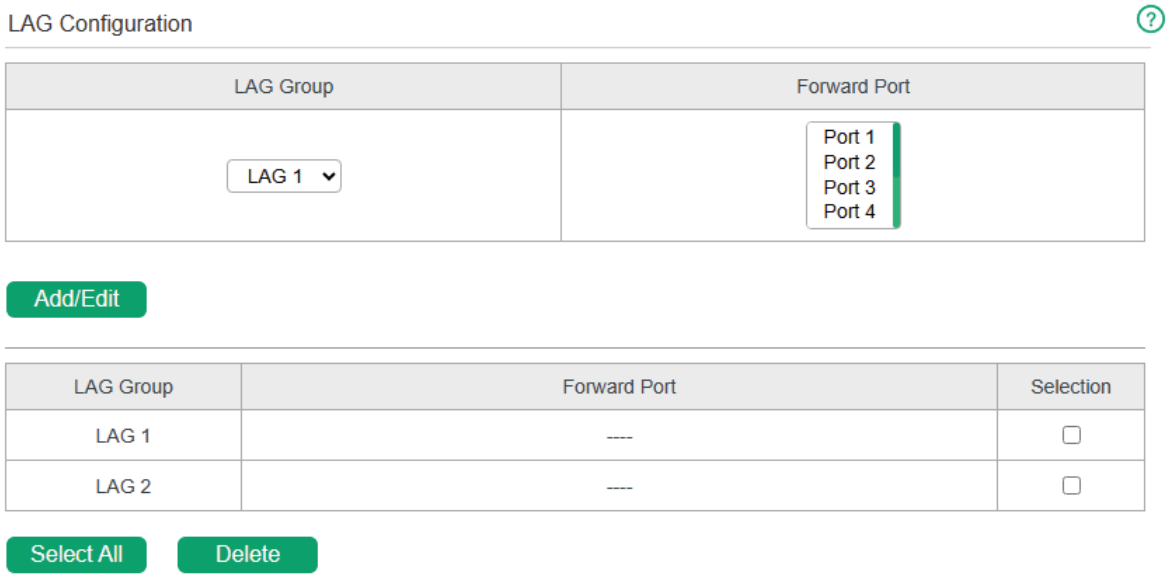
2) In the table below, you can view the current IGMP group information.

IP Address	Displays the IP address of the multicast group.
VLAN ID	Displays the VLAN ID of the multicast group. All port members of a multicast group should be included in the same VLAN.
Port	Displays the forwarding port list of the multicast group.

5 Configuring LAG

Choose the menu **Switching > LAG** to load the following page.

Figure 5-1 Configuring LAG



Follow these steps to configure LAG:

1) Select the desired LAG group from the drop-down list.
2) Click the ports to add to the LAG group. Click **Apply**.
3) In the table below, you can verify the LAG configuration result. You can select the LAG and click **Delete** to delete ports from the LAG group.

LAG Group	Displays the group number of the LAG Group.
Forward Port	Displays the LAG Group member ports.
Selection	Select the LAG Group.

Note:

- It is recommended to configure the LAG function before configuring the other functions for the member ports.
- Ensure that devices on both ends of the aggregation link use the same number of physical ports with the same speed and duplex mode, flow control setting

and QoS setting.

- Mirroring and mirrored ports cannot be added to an LAG group.
- The maximum of LAG groups varies among different devices. To check the maximum of LAG groups, refer to the actual web interface.
- Each LAG group has 1 port members at least and 4 port members at most.

6 Configuration Examples

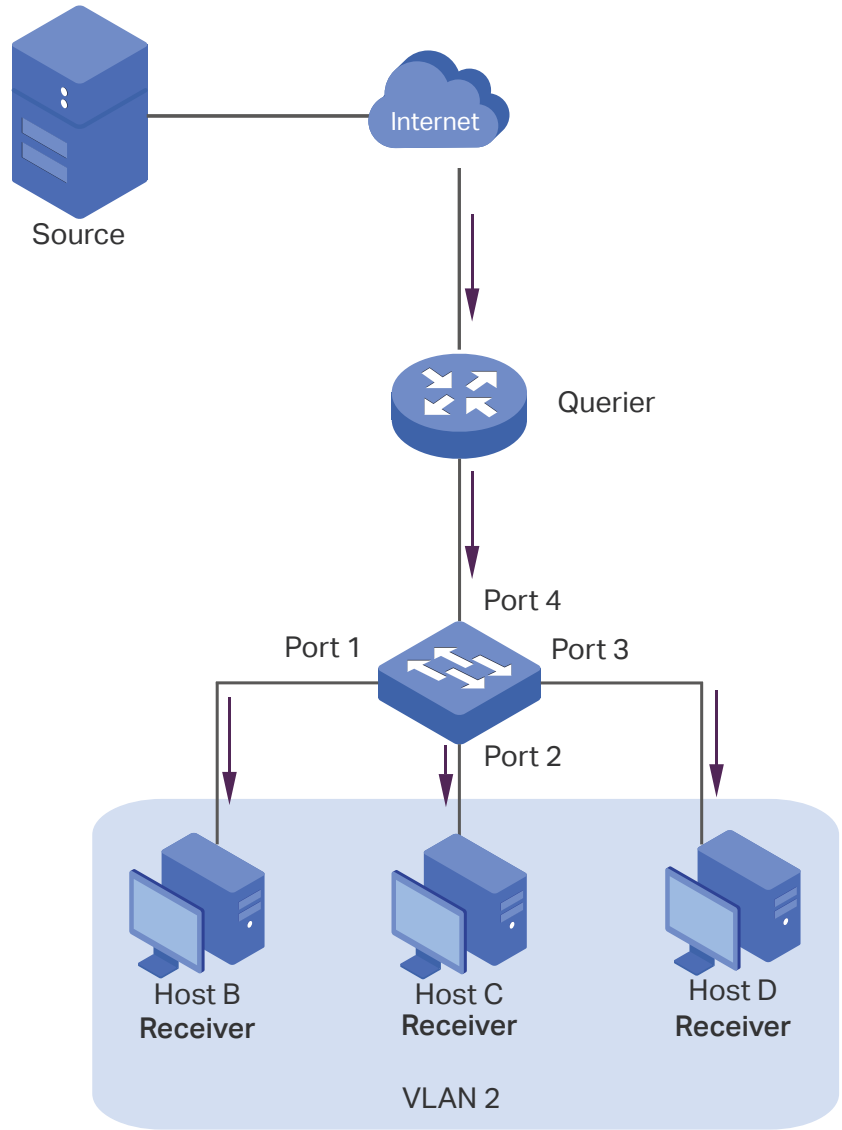
6.1 Example for Configuring IGMP Snooping

6.1.1 Network Requirements

Host B, Host C and Host D are in the same VLAN of the switch. All of them want to receive multicast streams sent to the same multicast group.

As shown in the following topology, Host B, Host C and Host D are connected to port 1, port 2 and port 3 respectively. Port 4 is the router port connected to the multicast querier.

Figure 6-1 Network Topology for Basic IGMP Snooping



6.1.2 Configuration Scheme

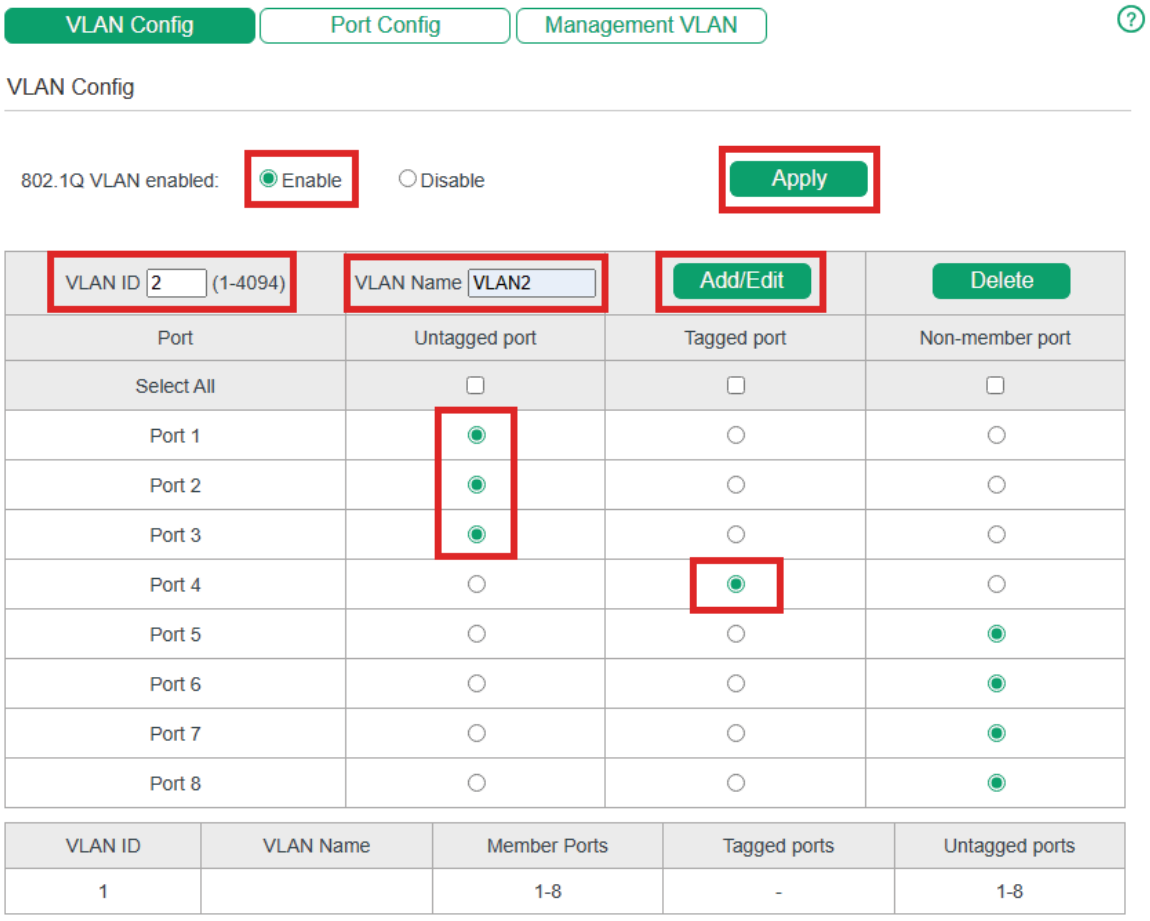
- Configure 802.1Q VLAN. Add the three member ports and the router port to the same VLAN.
- Enable IGMP Snooping.

Demonstrated with a specific model, the following section provides configuration steps.

6.1.3 Configuration Steps

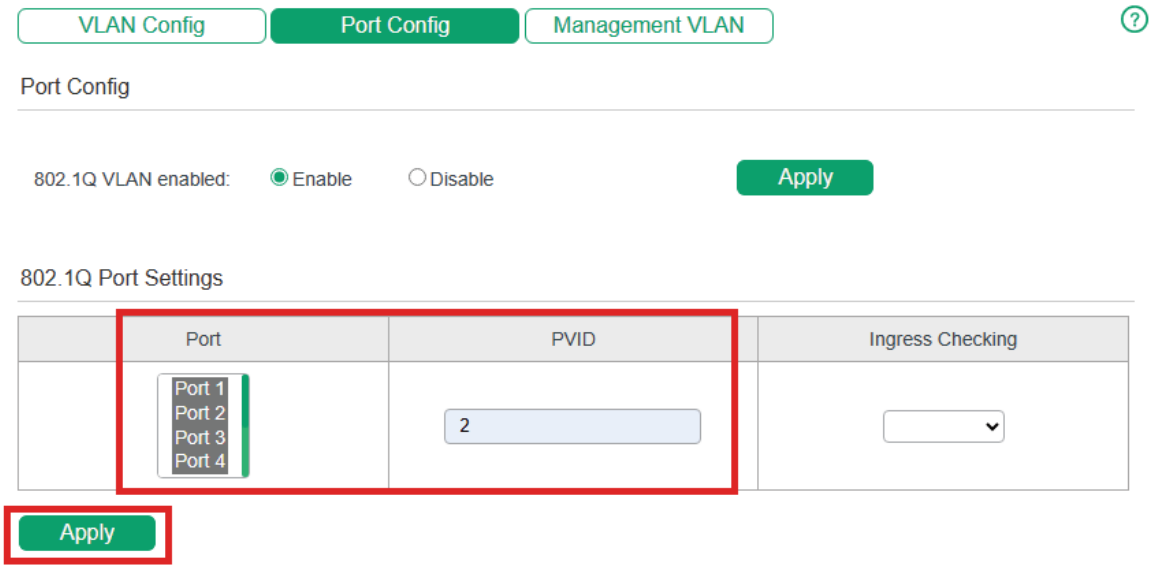
1) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page. Select the 802.1Q VLAN Configuration as **Enable**. Click **Apply**. Specify the VLAN ID as **2**. Specify the VLAN name as **VLAN2**. Select port 1, port 2, port 3 as untagged ports. Select port 4 as a tagged port. Click **Add/Edit**.

Figure 6-2 Configuring 802.1Q VLAN



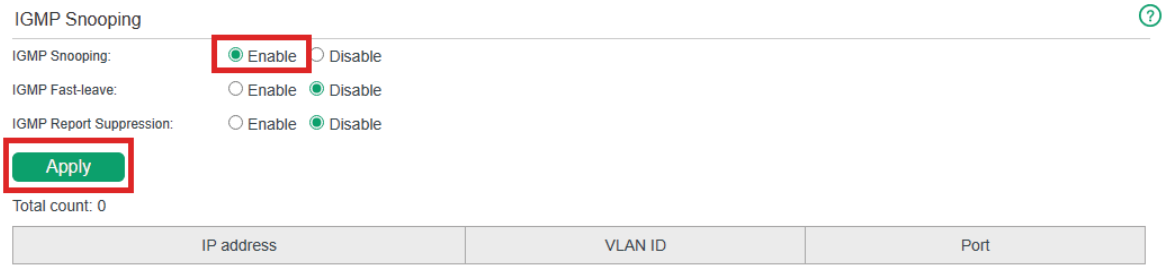
2) Choose the menu **VLAN > 802.1Q VLAN > Port Config** to load the following page. Select port 1, port 2, port 3 and port 4, and specify the PVID as 2 for the ports. Click **Apply**.

Figure 6-3 Configuring 802.1Q PVID



3) Choose the menu **Switching > IGMP Snooping** to load the following page. Enable IGMP snooping. Click **Apply**.

Figure 6-4 Configuring IGMP Snooping

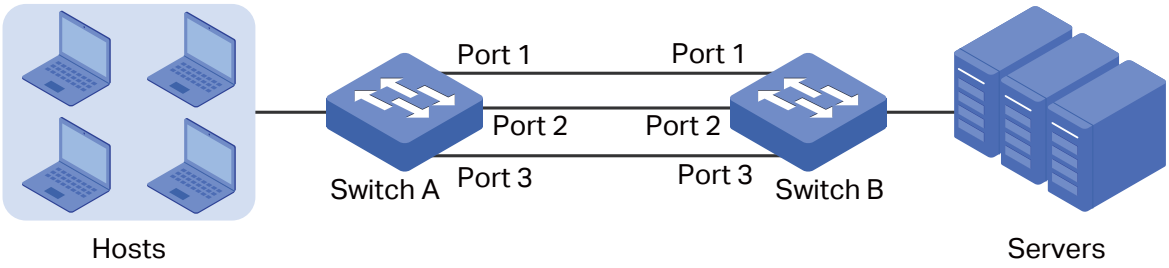


6.2 Example for Configuring LAG

6.2.1 Network Requirements

As shown below, hosts and servers are connected to Switch A and Switch B, and heavy traffic is transmitted between the two switches. To achieve high speed and reliability of data transmission, you can bundle multiple physical ports into one logical interface. In this case, we bundle port 1, port 2 and port 3 of both switches into one logical interface.

Figure 6-5 Network Topology for LAG

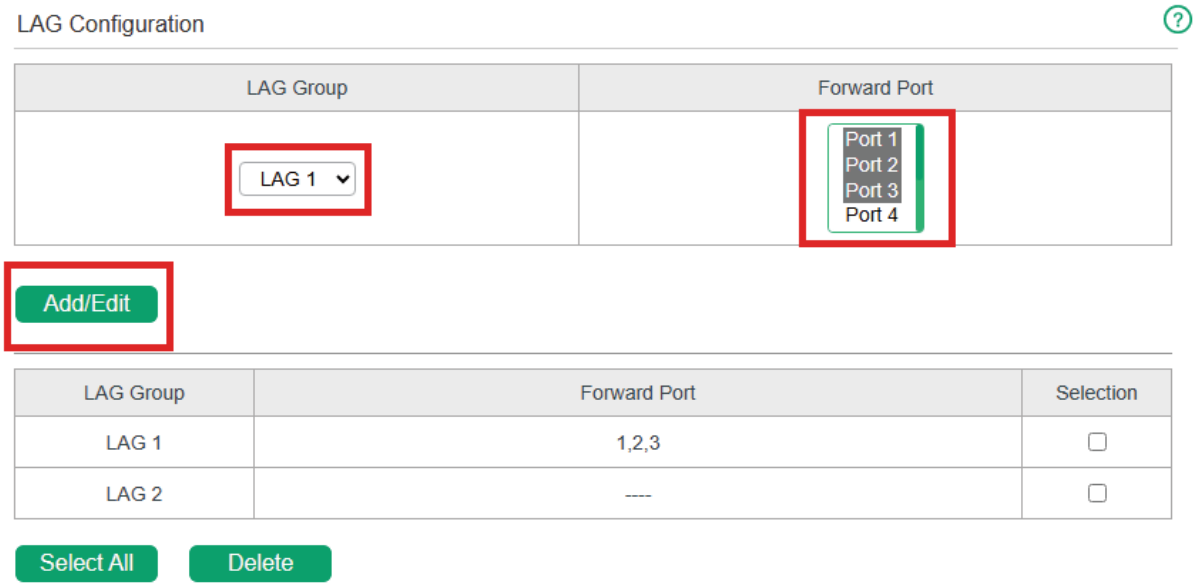


Demonstrated with a specific model, the following section provides configuration steps. The configuration steps are similar for both switches, here we take Switch A for example.

6.2.2 Configuration Steps

Choose the menu **Switching > LAG** to load the following page. Add Port 1, Port 2 and Port 3 to LAG 1. Click **Add/Edit**.

Figure 6-6 Configuring LAG



7 Appendix: Default Parameters

Default settings of Port are listed in the following table.

Table 7-1 Default Settings of Port Configuration

Parameter	Default Setting
State	Enabled
Speed	Auto
Duplex	Auto
Flow Control	Off

Default settings of IGMP Snooping are listed in the following table.

Table 7-2 Default Settings of IGMP Snooping Configuration

Parameter	Default Setting
IGMP Snooping	Enable
IGMP Fast-leave	Disable
IGMP Report Suppression	Disable

Default settings of LAG are listed in the following table.

Table 7-3 Default Settings of LAG Configuration

Parameter	Default Setting
LAG Group	LAG 1 (No port configured)

Part 4

Configuring VLAN

CHAPTERS

1 Overview

VLAN (Virtual Local Area Network) is a network technique that solves broadcasting issues in local area networks. It is usually applied in the following occasions:

- To restrict broadcast domain: VLAN technique divides a big local area network into several VLANs, and all VLAN traffic remains within its VLAN. It reduces the influence of broadcast traffic in Layer 2 network to the whole network.
- To enhance network security: Devices from different VLANs cannot achieve Layer 2 communication, and thus users can group and isolate devices to enhance network security.
- To facilitate management: VLANs group devices logically instead of physically, so devices in the same VLAN need not be located in the same place. It eases the management of devices in the same work group but located in different places.

There are 3 types of VLAN modes supported on the switch:

- MTU VLAN

MTU VLAN (Multi-Tenant Unit VLAN) defines an uplink port which will build up several VLANs with each of the other ports. Each VLAN contains two ports, the uplink port and one of the other ports in the switch, so the device connected to the uplink port can communicate with the device connected to any other port, but devices connected to other ports cannot communicate with each other.

- Port-Based VLAN

VLANs are divided based on ports. In port based VLAN mode, each port can only be added to one VLAN.

- 802.1Q VLAN

The IEEE 802.1Q protocol defines a new format of VLAN data frame (Tagged Frame). As the following figure shows, compared to the traditional Ethernet data frame (Untagged Frame), the VLAN data frame (Tagged Frame) adds a VLAN tag.

Figure 1-1 Untagged and Tagged Data Frame

Traditional Ethernet data frame (Untagged Frame)

Destination Address	Source Address	Length/Type	Data	FCS

VLAN data frame (Tagged Frame)

Destination Address	Source Address	VLAN Tag	Length/Type	Data	FCS

On receiving a tagged frame, the switch checks the VID (VLAN ID) contained in the VLAN tag to determine which VLAN the frame belongs to. On receiving an untagged frame, the switch will first insert a VLAN tag to the frame, using the PVID (Port VLAN ID) of the port as its VID, and then forward it as a tagged frame.

Note:

- The switch works in one and only one VLAN mode at any time. When a specific VLAN mode is enabled, the other two VLAN modes will be disabled automatically and the corresponding VLAN configuration will be lost.
- The switch supports up to 32 VLANs simultaneously.

2 Configuring MTU VLAN

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

Figure 2-1 Configuring MTU VLAN

Follow these steps to configure MTU VLAN:

1) Select MTU VLAN configuration as **Enable**. Click **Apply**.

MTU VLAN enabled:	Check the box to enable/disable the MTU VLAN mode.

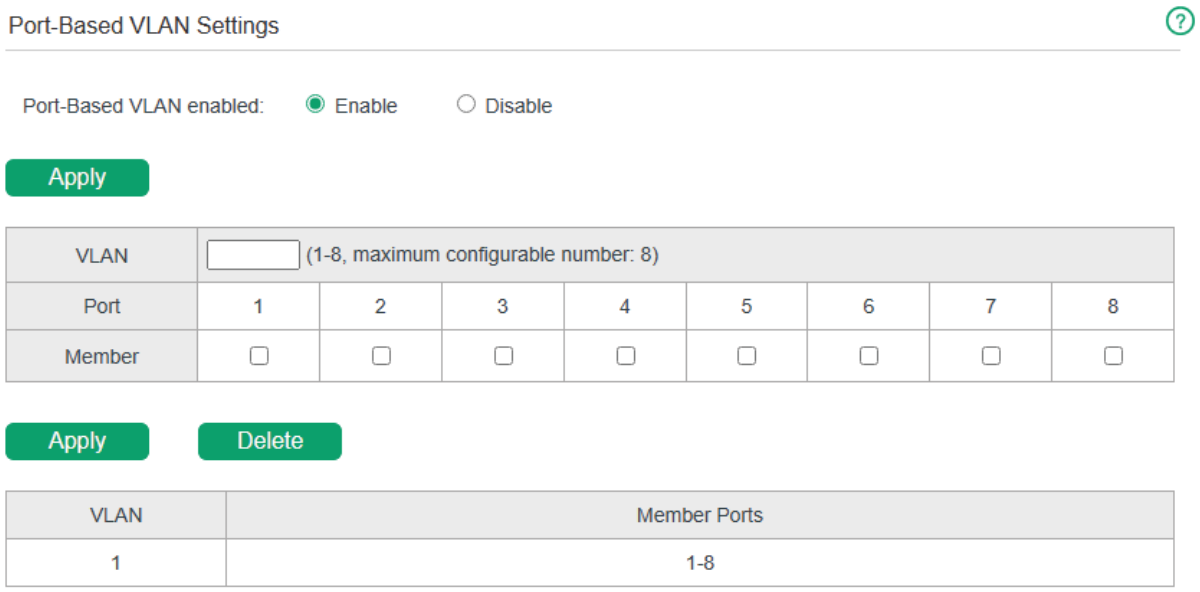
2) In the table below, change the uplink port from the list according to your needs. Click **Apply**.

Current Uplink Port	Displays the current uplink port of the MTU VLAN.
Select Uplink Port	Select the desired uplink port(s) from the list. The uplink port will build up several VLANs with each of the other ports.

3 Configuring Port-Based VLAN

Choose the menu **VLAN > Port-based VLAN** to load the following page.

Figure 3-1 Configuring Port-based VLAN



Follow these step to configure port-based VLAN:

1) Select the port-based VLAN configuration as **Enable.** Click **Apply**.

Port-based VLAN enabled	Check the box to enable/disable the Port-based VLAN.

2) Enter the VLAN ID and select ports to be added to the VLAN. Click **Apply**. To delete the VLAN created, enter the corresponding VLAN ID and click **Delete**.

VLAN	Enter the ID number of VLAN. It ranges from 1 to 32.
Port	Displays the port number.
Member	Click the checkbox to choose one or multiple member ports of the current VLAN. If this field is checked, it indicates the port belongs to the current VLAN.

3) In the table below, you can verify the configuration result of the port-based VLAN.

VLAN	Displays the ID number of VLAN.

Member Ports	Displays the member ports in the VLAN.

Note:

- By default, all the ports are added to VLAN 1.
- Once a port is added to another VLAN, it is deleted from the original VLAN automatically.
- Once a port is removed from all the other VLANs, it is added to VLAN 1 automatically.
- VLAN 1 includes at least one port and cannot be deleted.

4 Configuring 802.1Q VLAN

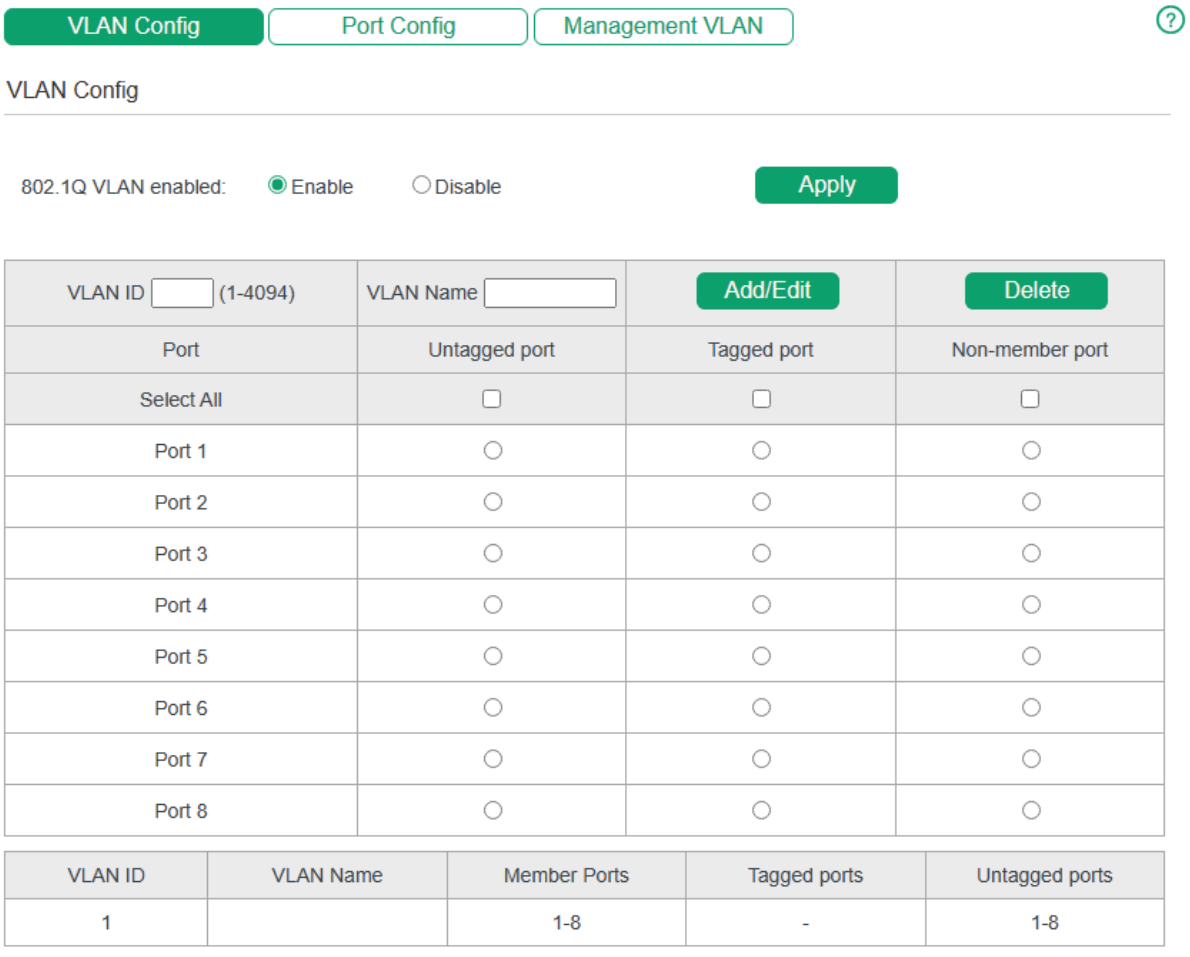
To complete the 802.1Q configuration, follow these steps:

1) Configure the VLAN, including creating a VLAN and adding the ports to the VLAN.
2) Configure the PVID.
3) Configure the management VLAN.

4.1 Configuring the VLAN

Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page.

Figure 4-1 Configuring 802.1Q VLAN



Follow these steps to configure the VLAN:

1) Select the 802.1Q VLAN configuration as **Enable**. Click **Apply**.

802.1Q VLAN enabled	Check the box to enable/disable the 802.1Q VLAN.

2) Enter a VLAN ID and a VLAN name to identify the VLAN. Select the untagged port(s) and the tagged port(s) respectively to be added to the created VLAN based on the network topology. Click **Add/Edit**. To delete the VLAN created, enter the corresponding VLAN ID and click **Delete**.

VLAN ID	Enter a VLAN ID, which ranges from 1 to 4094.
VLAN Name	Enter a VLAN name to identify the VLAN. The VLAN name only allows numbers, letters and underscores, and should not exceed 10 characters in length.
Untagged/ Tagged/ Non-member port	Set the port as an untagged port, a tagged port or a non-member port in the VLAN. **Untagged port**: Click the checkbox to configure the egress rule of the traffic on this port as untagged. The switch drops the tag header before sending the packet. **Tagged port**: Click the checkbox to configure the egress rule of the traffic on this port as tagged. The switch adds the tag header before sending the packet. **Non-member port**: Click the checkbox to exclude the port from the current VLAN.

3) In the table below, you can verify the configuration result of the 802.1Q VLAN.

VLAN ID	Displays the ID number of VLAN.
VLAN Name	Displays the user-defined description of the VLAN.
Member Ports	Displays the member ports in the VLAN.
Tagged Ports	Displays the tagged member ports in the VLAN.

Untagged Ports	Displays the untagged member ports in the VLAN.

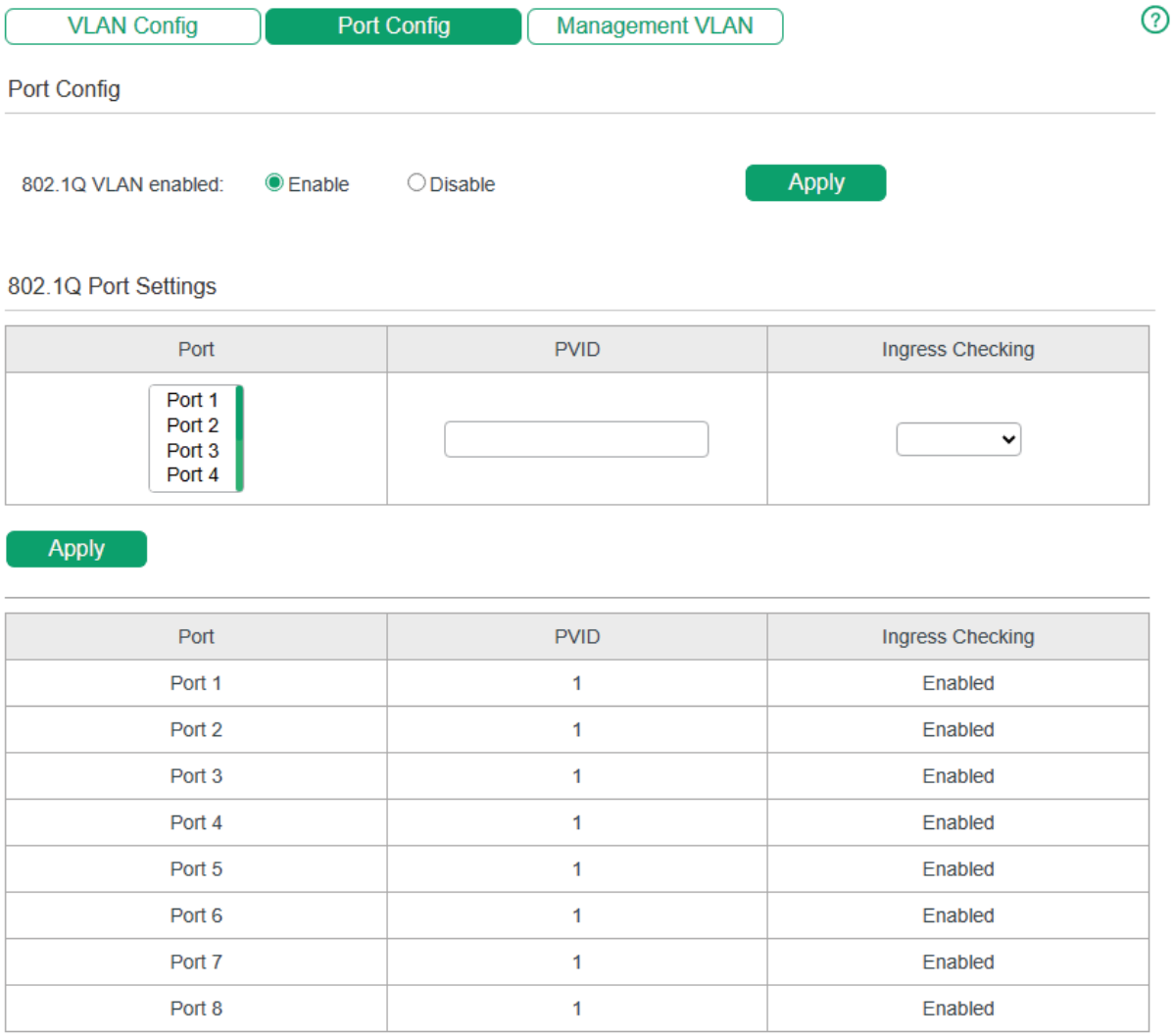
Note:

- By default, all the ports are added to VLAN 1.
- The port can be removed from VLAN 1 only when the port is also a member of the other VLANs.
- Once a port is removed from all the current VLANs, it is added to VLAN 1 automatically.
- VLAN 1 cannot be deleted.

4.2 Configuring the PVID

Choose the menu **VLAN > 802.1Q VLAN > Port Config** to load the following page.

Figure 4-2 Configuring 802.1Q PVID



Port	PVID	Ingress Checking
Port 1	1	Enabled
Port 2	1	Enabled
Port 3	1	Enabled
Port 4	1	Enabled
Port 5	1	Enabled
Port 6	1	Enabled
Port 7	1	Enabled
Port 8	1	Enabled

Follow these steps to configure the PVID:

1) Select the ports, set the PVID for the ports, and choose from the drop-down list to enable or disable Ingress Checking.

PVID	Enter the default VLAN ID for the port. It can be added to the untagged packets as VLAN ID, and then the port will forward the packets in the corresponding VLAN.
Ingress Checking	Enable or disable Ingress Checking. With this function enabled, the port will accept the packet of which the VLAN ID is in the port's VLAN list and discard others. With this function disabled, the port will forward the packet directly.

2) Click **Apply.**

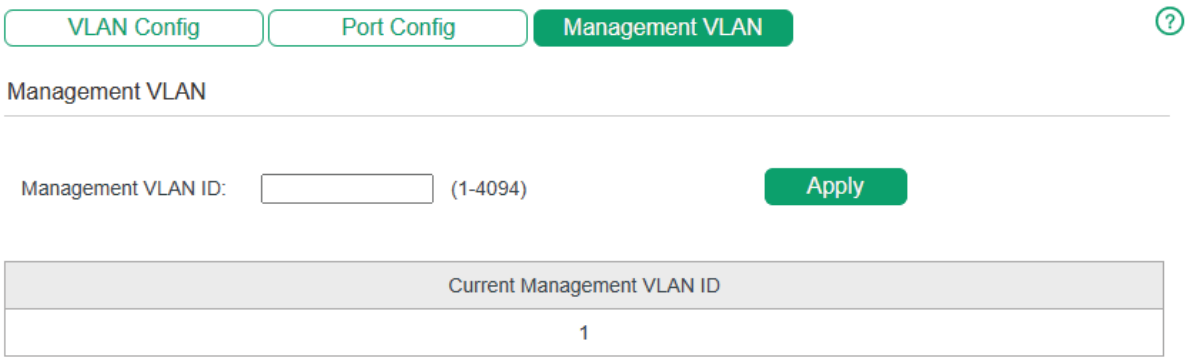
Note:

- The PVID configuration will take effect only when 802.1Q VLAN mode is enabled.
- You can specify a PVID only when the corresponding VLAN exists.

4.3 Configuring Management VLAN

Choose the menu **VLAN > 802.1Q VLAN > Management VLAN** to load the following page.

Figure 4-3 Configuring Management VLAN



Follow these steps to configure the management VLAN:

1) Specify the management VLAN ID.

Management VLAN ID	Configure specific management VLANs, which should be within the range the configured 802.1Q VLANs. After configuration, only PCs with management VLAN tags can access to the management interface. Multiple management VLAN IDs can be configured.

2) Click **Apply**.

Note:

- Only the computer in this VLAN can access the management interface of the switch.
- The management VLAN should have at least one VLAN and at least one port belongs to this VLAN. By default, the management VLAN ID is 1.
- It is not recommended to remove the port used to access the current management page from the management VLAN.
- The management VLAN configuration will only take effect when 802.1Q VLAN is enabled.

5 Configuration Example for 802.1Q VLAN

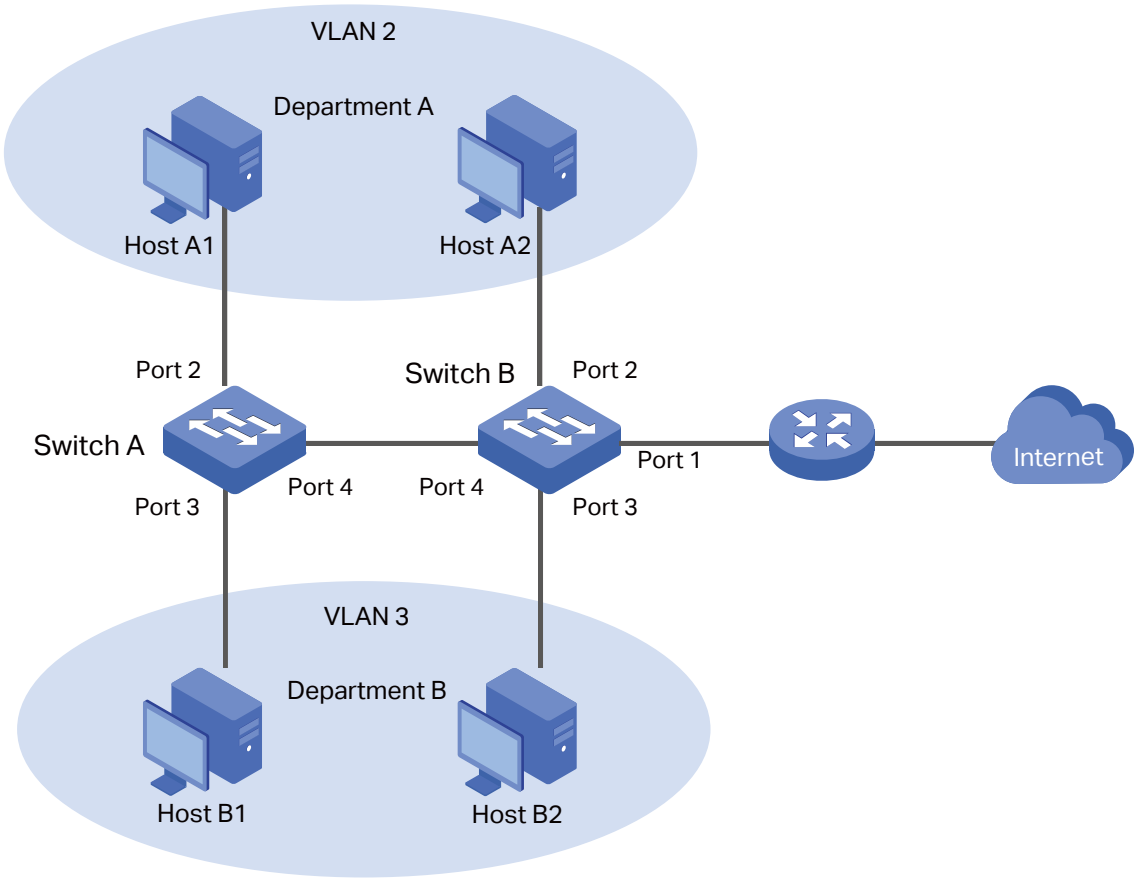
5.1 Network Requirements

As the following figure shows, a company has two departments. Hosts of the same department are located in different places and connected to different switches respectively.

Requirements:

- Hosts of both departments can access the internet.
- Hosts of the same department can communicate with each other, but hosts of different departments cannot.

Figure 5-1 Network Topology



5.2 Configuration Scheme

To implement the above requirements, configure 802.1Q VLAN on both switches.

- Create VLAN 2. On Switch A, add port 2 and port 4 to VLAN 2, while on Switch B, add port 1, port 2 and port 4 to VLAN 2.
- Create VLAN 3. On Switch A, add port 3 and port 4 of Switch A to VLAN 3, while on Switch B, add port 1, port 3 and port 4 to VLAN 3.
- Configure the default VLAN 1 to make sure the router can communicate with all ports of the two switches.

Table 5-1 and 5-2 show configurations of VLANs on each switch.

Table 5-1 Relationships of Ports and VLANs on Switch A and Switch B.

Switch	Ports in VLAN 1	Ports in VLAN 2	Ports in VLAN 3
Switch A	2, 3, 4	2, 4	3, 4
Switch B	1, 2, 3, 4	1, 2 ,4	1, 3, 4

Table 5-2 Settings of Egress Rule and PVID on Switch A and Switch B

Switch	Ports in VLAN 1	Ports in VLAN 2	Ports in VLAN 3
Switch A	2	Untagged	2
	3	Untagged	3
	4	Tagged	1
Switch B	1	Untagged	1
	2	Untagged	2
	3	Untagged	3
	4	Tagged	1

Note:

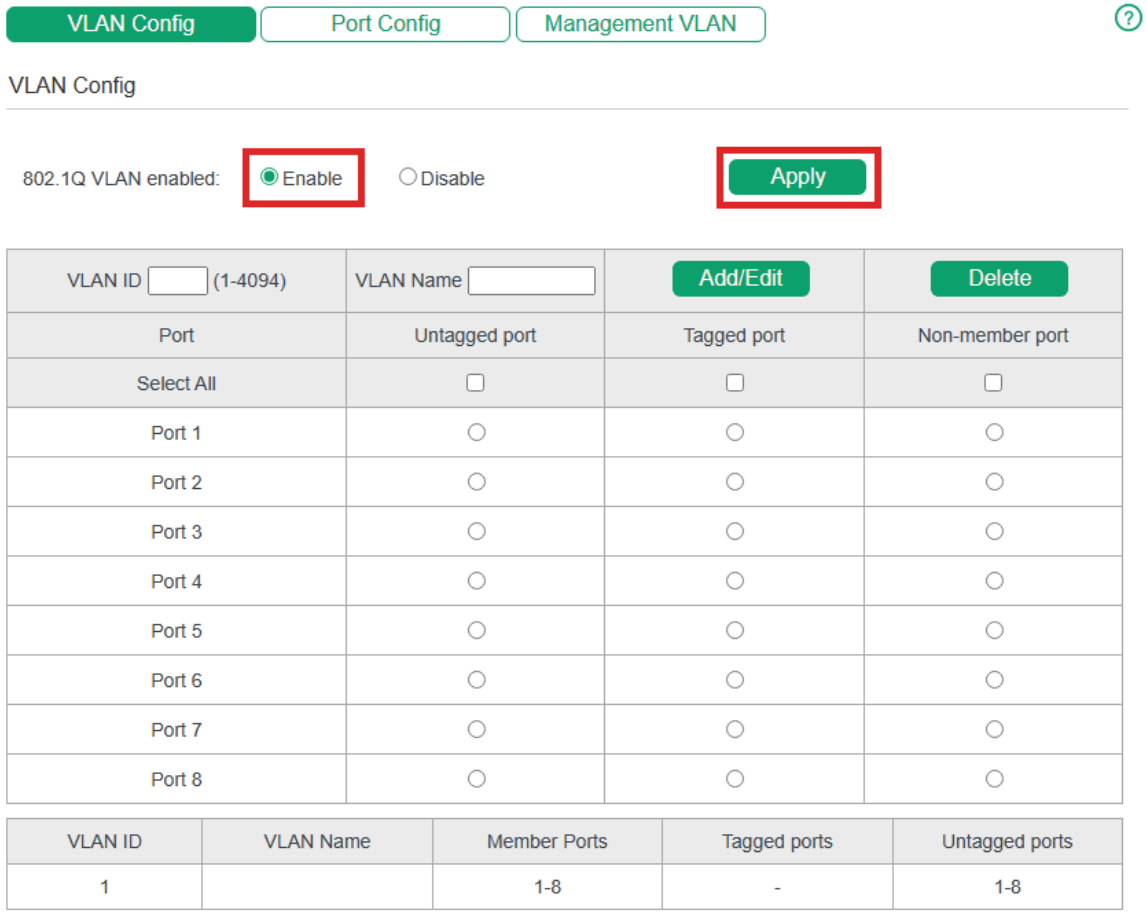
If a port is connected to terminal devices like computers, add the port to the corresponding VLANs as an untagged port, because terminal devices typically do not support VLAN tags.

5.3 Configuration Steps

Demonstrated with a specific model, the following section provides configuration steps. The configuration steps on both switches are similar. Here we take Switch A for example.

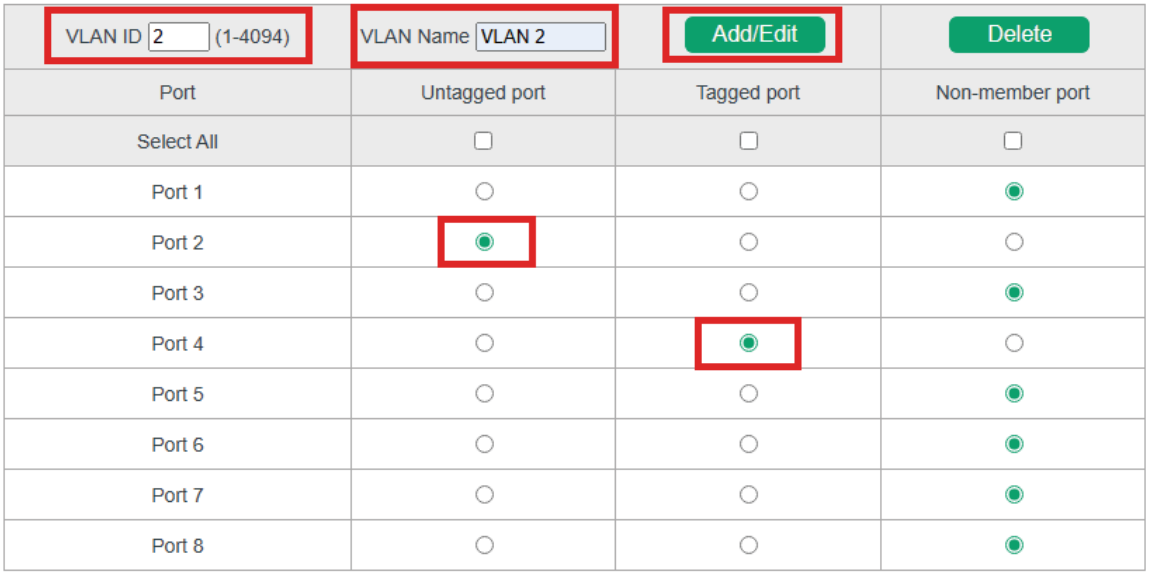
1) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page. Select 802.1Q VLAN configuration as **Enable**. Click **Apply**.

Figure 5-2 Configuring 802.1Q VLAN



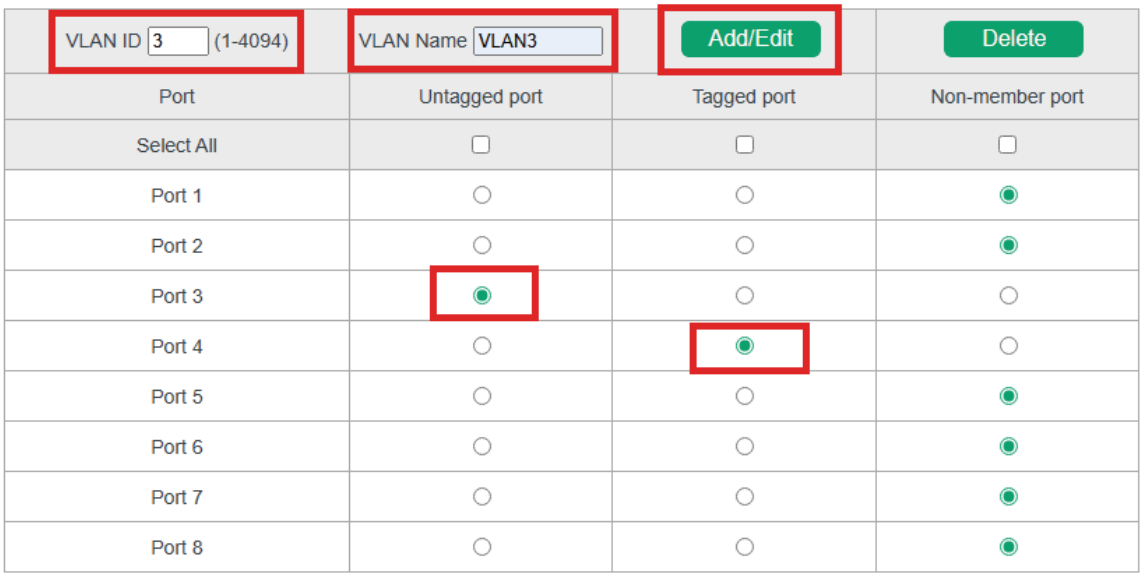
2) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page and create VLAN 2. Specify VLAN ID as **2**, add port 2 to the VLAN as an untagged port, and add port 4 to the VLAN as a tagged port. Click **Add/Edit**.

Figure 5-3 Creating VLAN 2 and Adding Ports to the VLAN



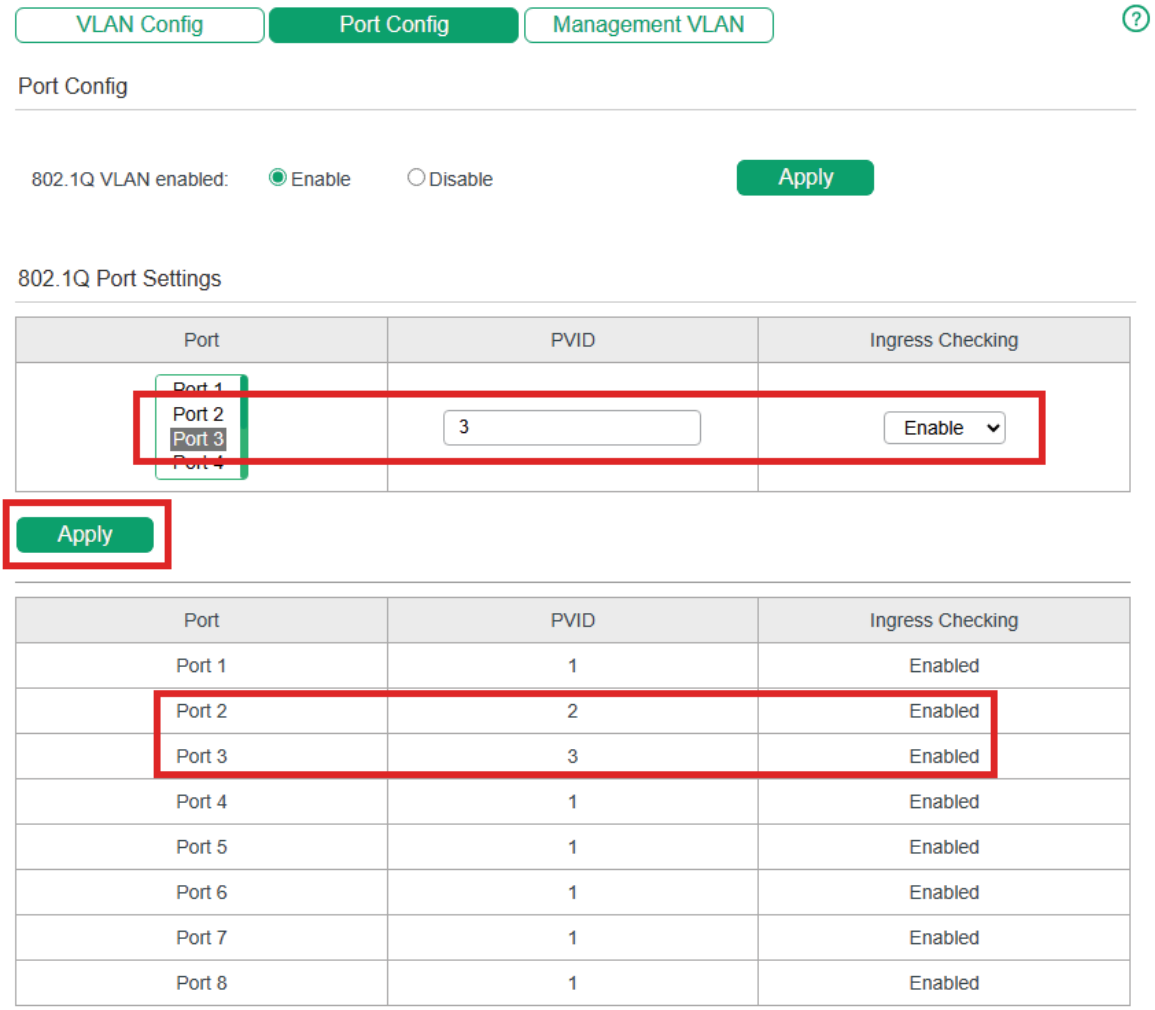
3) Choose the menu **VLAN > 802.1Q VLAN > VLAN Config** to load the following page and create VLAN 3. Specify VLAN ID as **3**, add port 3 to the VLAN as an untagged port, and add port 4 to the VLAN as a tagged port. Click **Add/Edit**.

Figure 5-4 Creating VLAN 3 and Adding Ports to the VLAN



4) Choose the menu **VLAN > 802.1Q VLAN > Port Config** to load the following page. Specify the PVID of port 2 as **2** and click **Apply**. Specify the PVID of port **3** as 3 and click **Apply**.

Figure 5-5 Configuring 802.1Q PVID



6 Appendix: Default Parameters

Default settings of VLAN are listed in the following tables.

Table 6-1 Default Settings of MTU VLAN Configuration

Parameter	Default Setting
MTU VLAN Configuration	Disable

Table 6-2 Default Settings of Port Based VLAN Configuration

Parameter	Default Setting
Port Based VLAN Configuration	Enable
VLAN ID	1

Table 6-3 Default Settings of 802.1Q VLAN Configuration

Parameter	Default Setting
802.1Q VLAN Configuration	Disable

Table 6-4 Default Settings of 802.1Q VLAN PVID Configuration

Parameter	Default Setting
PVID	1

Table 6-5 Default Settings of 802.1Q VLAN Management VLAN Configuration

Parameter	Default Setting
Management VLAN ID	1

Part 5

Configuring QoS

CHAPTERS

1 QoS

1.1 Overview

With network scale expanding and applications developing, internet traffic is dramatically increased, thus resulting in network congestion, packet drops and long transmission delay. Typically, networks treat all traffic equally on FIFO (First In First Out) delivery basis, but nowadays many special applications like VoD, video conferences, VoIP, etc. require more bandwidth or shorter transmission delay to guarantee the performance.

With QoS (Quality of Service) technology, you can classify and prioritize network traffic to provide differentiated services for certain types of traffic.

1.2 Supported Features

With the QoS feature, You can configure QoS Basic, Rate Limit and Storm Control on the switch to maximize the network performance and bandwidth utilization.

QoS Basic

QoS (Quality of Service) function is used to optimize the network performance. It provides you with network service experience of a better quality. The switch implements three priority modes based on port, 802.1p and DSCP.

Rate Limit

With a limited bandwidth, you can control the traffic rate on each port to ensure network in working order.

Storm Control

Storm Control function allows the switch to monitor broadcast packets, multicast packets and UL-frames (Unknown unicast frames) in the network. If the transmission rate of the packets exceeds the limit, the packets will be automatically discarded to avoid network broadcast storm.

2 Configuring Basic QoS

Configuration Guidelines

Select the QoS mode according to your network requirements. Three QoS modes are supported on the switch: Port-based, 802.1p-based and DSCP-based.

- Port-Based

The Port Priority function can classify the packets based on the ports that the packets reach, then map them to different queues.

- Based on 802.1p

802.1p gives the Priority field in 802.1Q tag a recommended definition. The tagged packets are mapped to different priority levels based on 802.1Q tag.

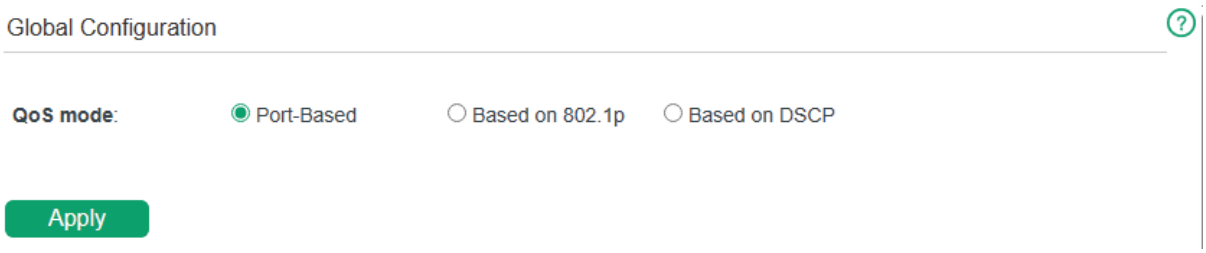
- Based on DSCP

DSCP gives the IP DSCP field a recommended definition. The IP packets are mapped to different priority levels based on DSCP value.

2.1 Configuring QoS in Port-Based Mode

Choose the menu **QoS > QoS Basic** to load the following page.

Figure 2-1 Configuring Basic QoS in Port-Based Mode



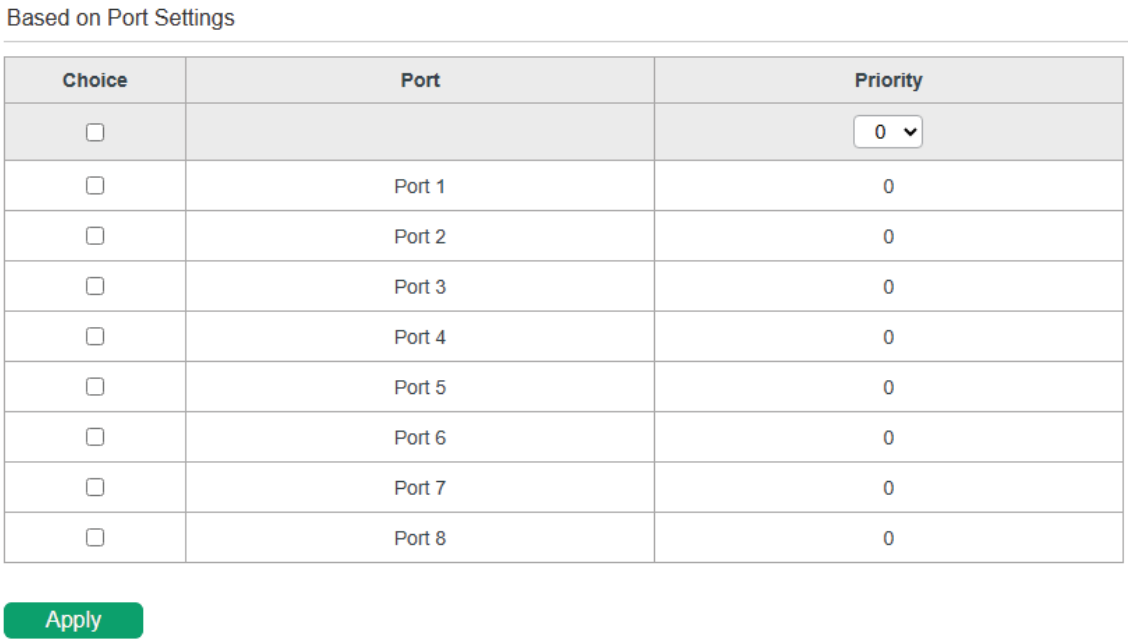
Follow these steps to configure QoS in port-based mode:

1) In the **Global Configuration** section, select QoS mode as **Port-Based.** Click **Apply**.

QoS Mode	Select the QoS mode.

2) In the **Based on Port Settings** section, specify the mapping from Port to Priority. Click **Apply**.

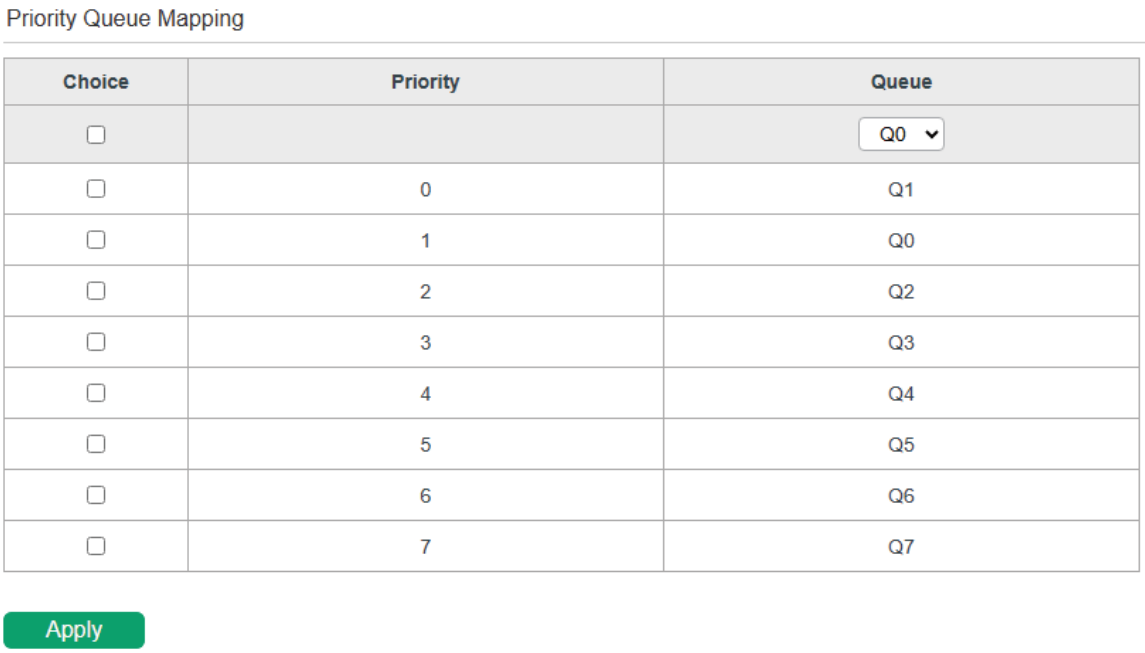
Figure 2-2 Configuring Based on Port Settings



Choice	Select the desired port for port priority configuration.
Port	Displays the physical port number of the switch.
Priority	Specify the priority for the port.

3) In the **Priority Queue Mapping** section, specify the mapping from Priority to Queue. Click **Apply**.

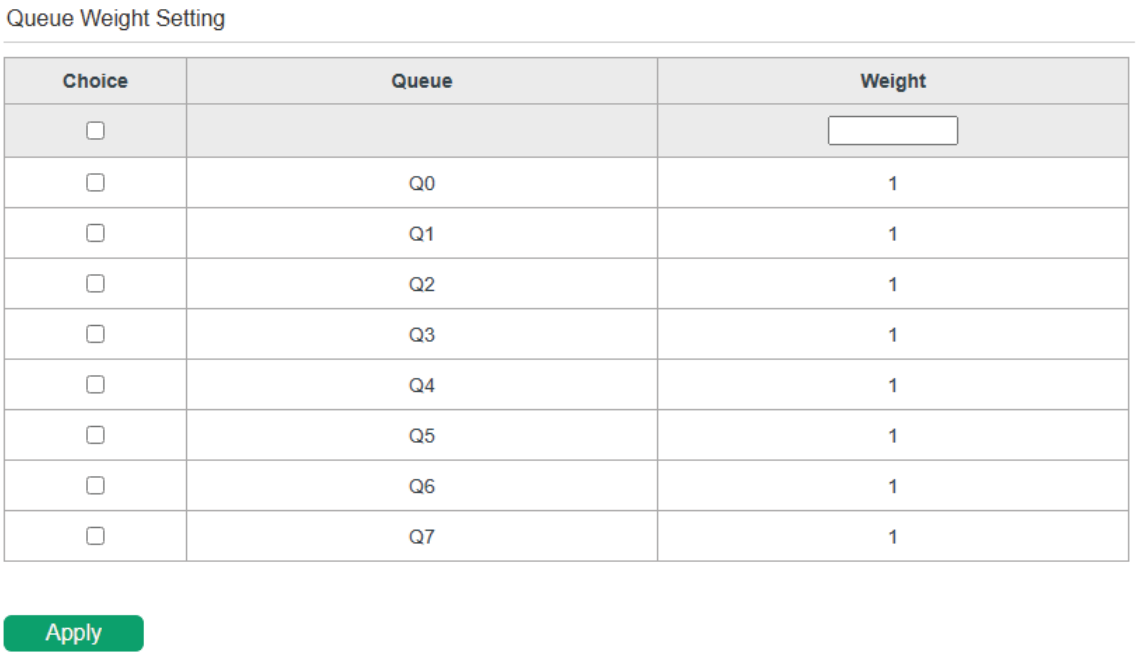
Figure 2-3 Configuring Priority Queue Mapping



Choice	Select the desired priority for queue configuration.
Priority	Displays the priority number.
Queue	Select the queue for the desired priority.

4) In the **Queue Weight Setting** section, specify the mapping from Queue to Weight. Click Apply.

Figure 2-4 Configuring Queue Weight Setting

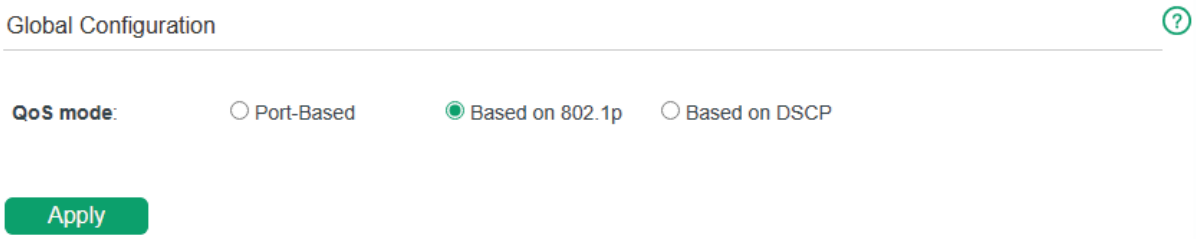


Choice	Select the desired queue for weight configuration.
Queue	Displays the number of queue.
Weight	Specify the queue weight for the desired queue. The weight value identifies the bandwidth allocation ratio of different queues. Queues with higher weights will be assigned a larger proportion of bandwidth.

2.2 Configuring QoS in 802.1p-Based Mode

Choose the menu **QoS > QoS Basic** to load the following page.

Figure 2-5 Configuring Basic QoS in 802.1p-Based Mode

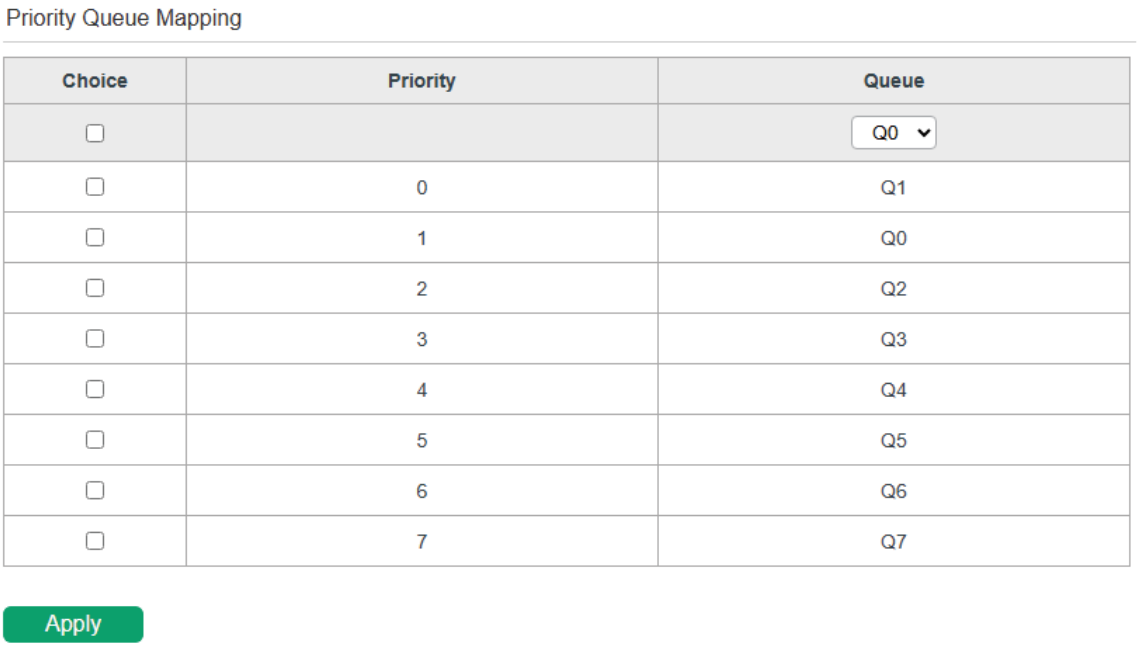


Follow these steps to configure QoS based on 802.1p:

1) In the **Global Configuration** section, select QoS mode as **Based on 802.1p.** Click **Apply**.

2) In the **Priority Queue Mapping** section, specify the mapping from Priority to Queue. Click **Apply**.

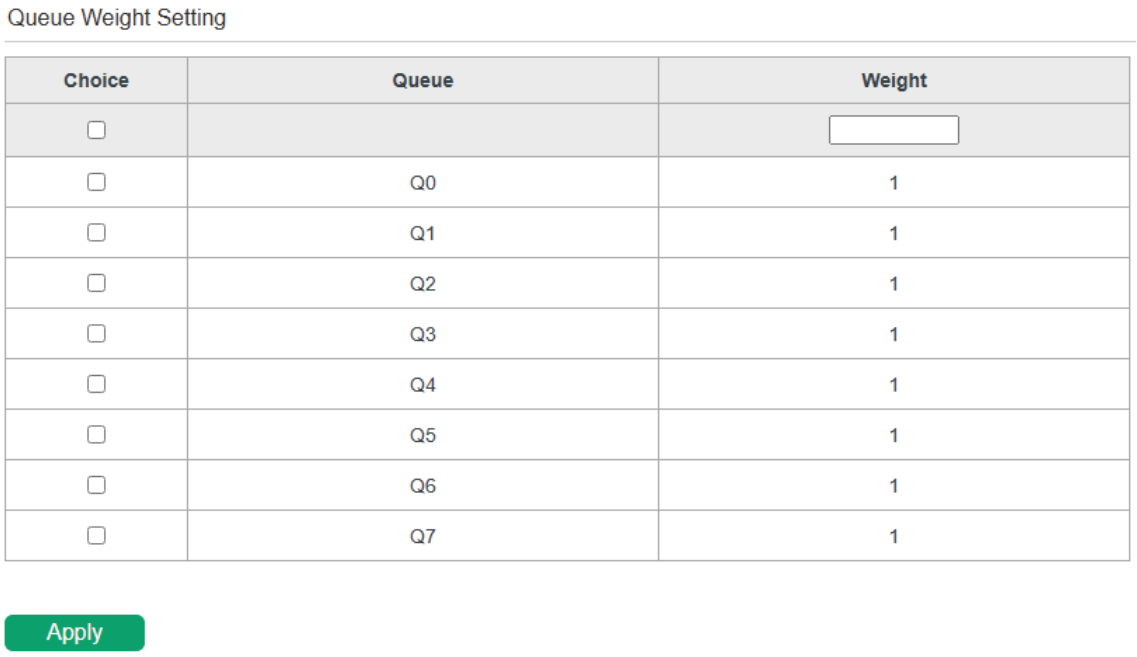
Figure 2-6 Configuring Priority Queue Mapping



Choice	Select the desired priority for queue configuration.
Priority	Displays the priority number.
Queue	Select the queue for the desired 802.1p priority.

3) In the **Queue Weight Setting** section, specify the mapping from Queue to Weight. Click Apply.

Figure 2-7 Configuring Queue Weight Setting

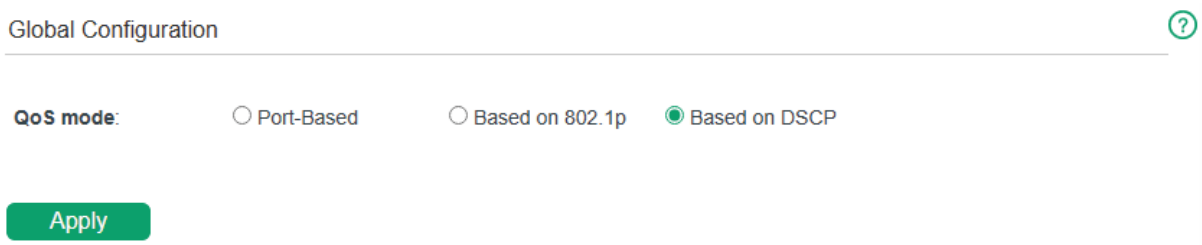


Choice	Select the desired queue for weight configuration.
Queue	Displays the ID number of priority Queue.
Weight	Specify the queue weight for the desired queue. The weight value identifies the bandwidth allocation ratio of different queues. Queues with higher weights will be assigned a larger proportion of bandwidth.

2.3 Configuring QoS in DSCP-Based Mode

Choose the menu **QoS > QoS Basic** to load the following page.

Figure 2-8 Configuring Basic QoS in DSCP-Based Mode

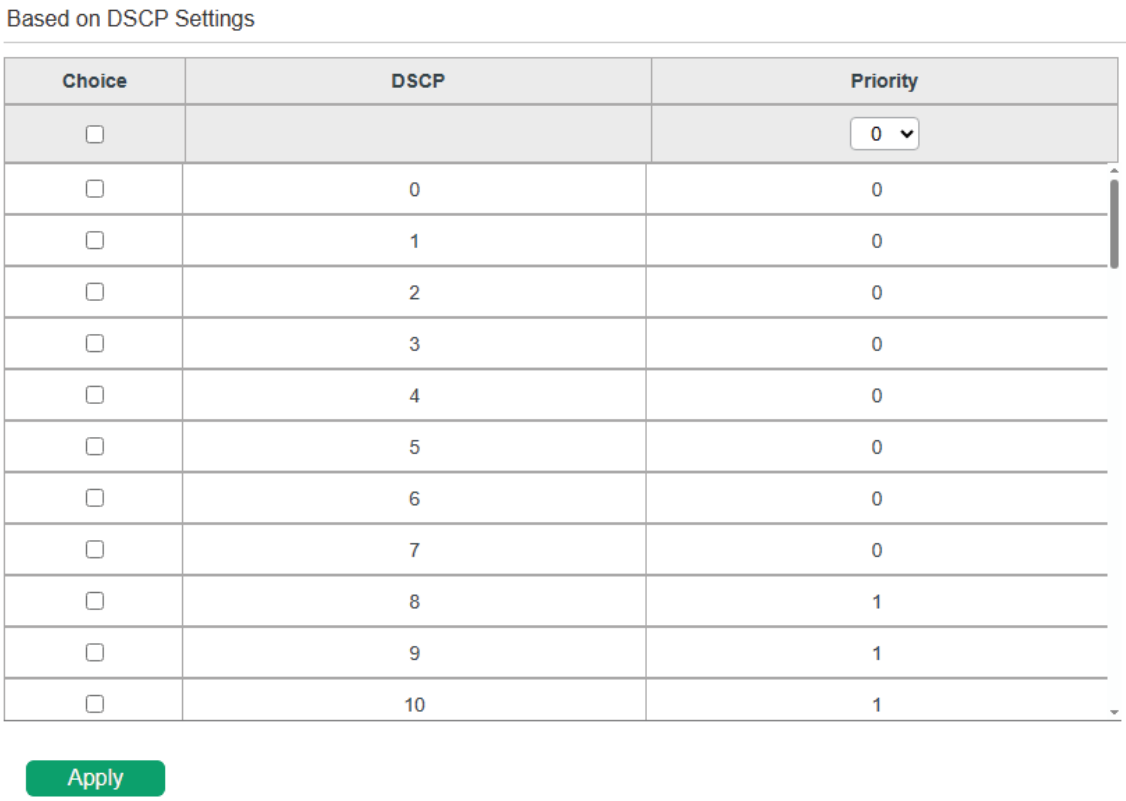


Follow these steps to configure QoS based on DSCP:

1) In the **Global Configuration** section, select QoS mode as **Based on DSCP.** Click **Apply**.

2) In the **Based on DSCP Settings** section, specify the mapping from DSCP to Priority. Click **Apply**.

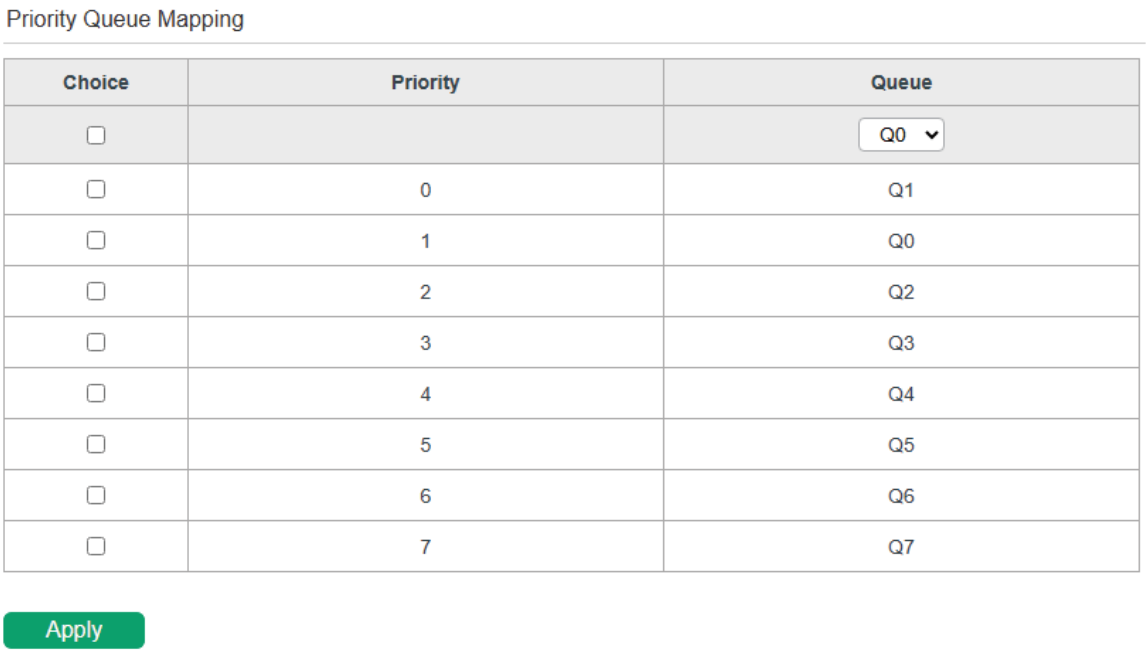
Figure 2-9 Configuring Based on DSCP Settings



Choice	Select the desired DSCP values for priority configuration.
DSCP	Displays the DSCP values.
Priority	Select the priority for the desired DSCP values.

3) In the **Priority Queue Mapping** section, specify the mapping from Priority to Queue. Click **Apply**.

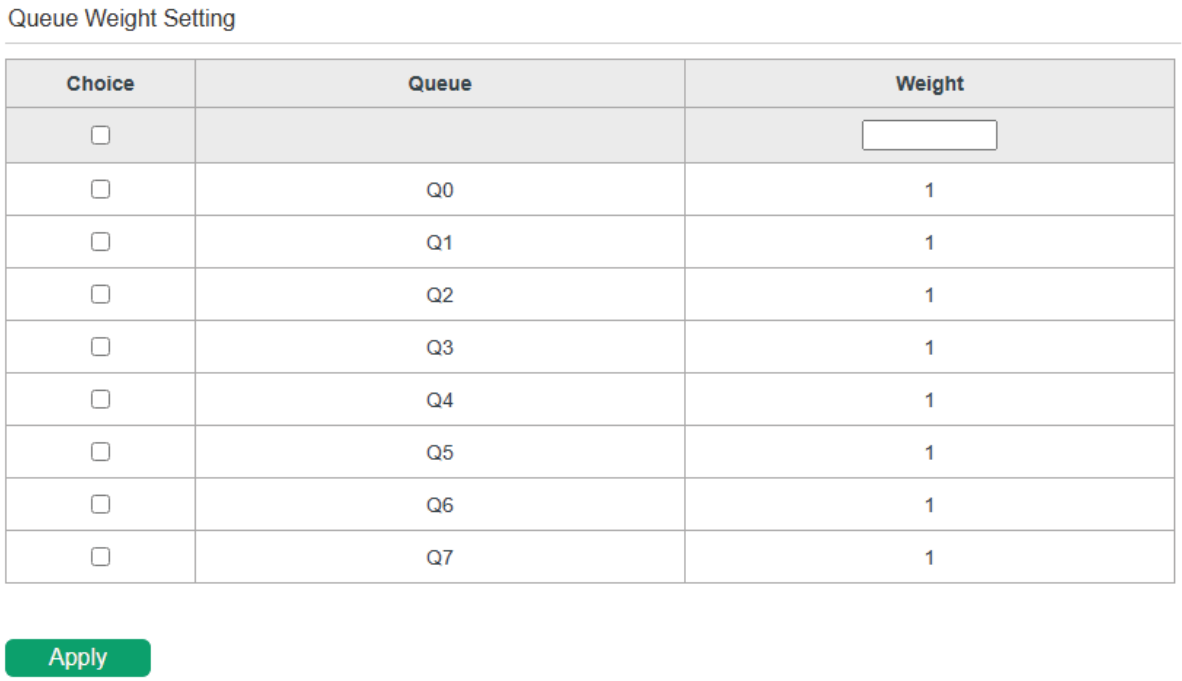
Figure 2-10 Configuring Priority Queue Mapping



Choice	Select the desired priority for queue configuration.
Priority	Displays the priority number.
Queue	Select the queue for the desired priority.

4) In the **Queue Weight Setting** section, specify the mapping from Queue to Weight. Click Apply.

Figure 2-11 Configuring Queue Weight Setting

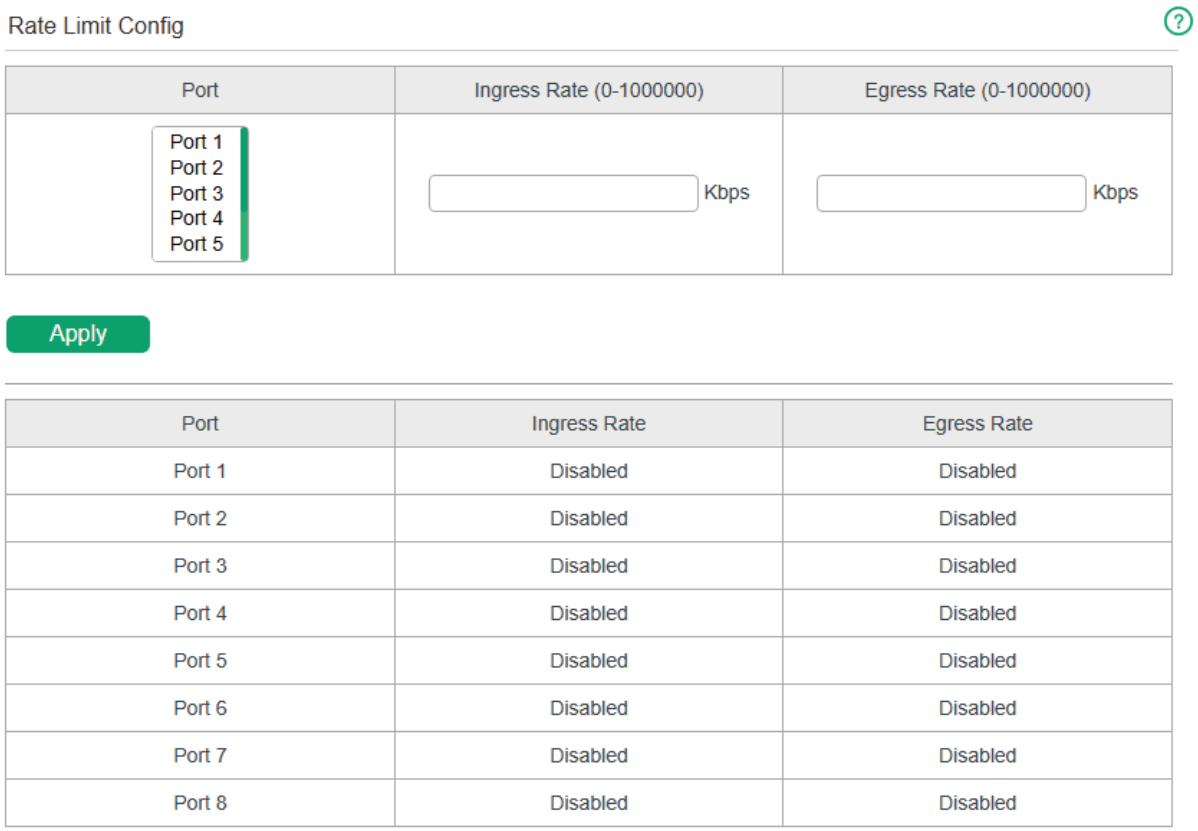


Choice	Select the desired queue for weight configuration.
Queue	Displays the ID number of priority Queue.
Weight	Specify the queue weight for the desired queue. The weight value identifies the bandwidth allocation ratio of different queues. Queues with higher weights will be assigned a larger proportion of bandwidth.

3 Configuring Rate Limit

Choose the menu **QoS > Rate Limit** to load the following page.

Figure 3-1 Configuring Rate Limit



Follow these steps to configure rate limit:

1) To enable rate limit, select the desired ports and configure the ingress rate and egress rate for the ports. To disable the function, set the ingress rate and egress rate as 0 for the ports.

Ingress Rate (Kbps)	Configure the bandwidth for receiving packets on the port. If the rate for receiving packets on the port exceeds the ingress rate, the packets will be discarded.
Egress Rate (Kbps)	Configure the bandwidth for sending packets on the port. If the rate for sending packets on the port exceeds the egress rate, the packets will be discarded.

2) Click **Apply**.

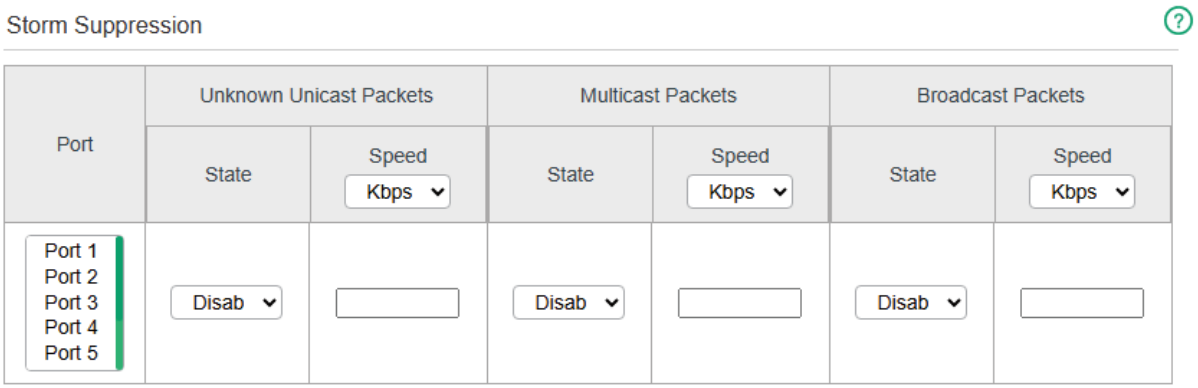
Note:

- For a port, the ingress rate control feature and the storm control feature cannot be enabled at the same time. If you enable ingress rate control for a port, storm control will be disabled for that port automatically.
- When egress rate is set for one or more ports, it is recommended to disable the flow control on each port to ensure the switch works normally.
- For ports in the same LAG, rate limit should be configured the same to ensure a successful port aggregation.

4 Configuring Storm Control

Choose the menu **QoS > Storm Control** to load the following page.

Figure 4-1 Configuring Storm Control



Port	Unknown Unicast Packets		Multicast Packets		Broadcast Packets	
	State	Speed	State	Speed	State	Speed
Port 1	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 2	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 3	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 4	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 5	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 6	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 7	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps
Port 8	Disabled	0Kbps	Disabled	0Kbps	Disabled	0Kbps

Follow these steps to configure storm control:

1) Select the desired ports and configure the upper rate limit for forwarding unknown unicast packets, multicast packets and broadcast packets.

State	Enable or disable storm control on the port.

Speed	Specify the speed for the broadcast threshold, multicast threshold and unknown unicast frames threshold on the desired port. kbps: The switch will limit the maximum speed of the specific kinds of traffic in kilo-bits per second. pps: The switch will limit the maximum speed of the specific kinds of traffic in packets per second.
Unknown Unicast Packets	Specify the upper rate limit for receiving unknown unicast frames. The traffic exceeding the limit will be processed according to the Action configurations.
Multicast Packets	Specify the upper rate limit for receiving multicast packets. The multicast traffic exceeding the limit will be processed according to the Action configurations.
Broadcast Packets	Specify the upper rate limit for receiving broadcast packets. The broadcast traffic exceeding the limit will be processed according to the Action configurations.

2) Click **Apply**.

Note:

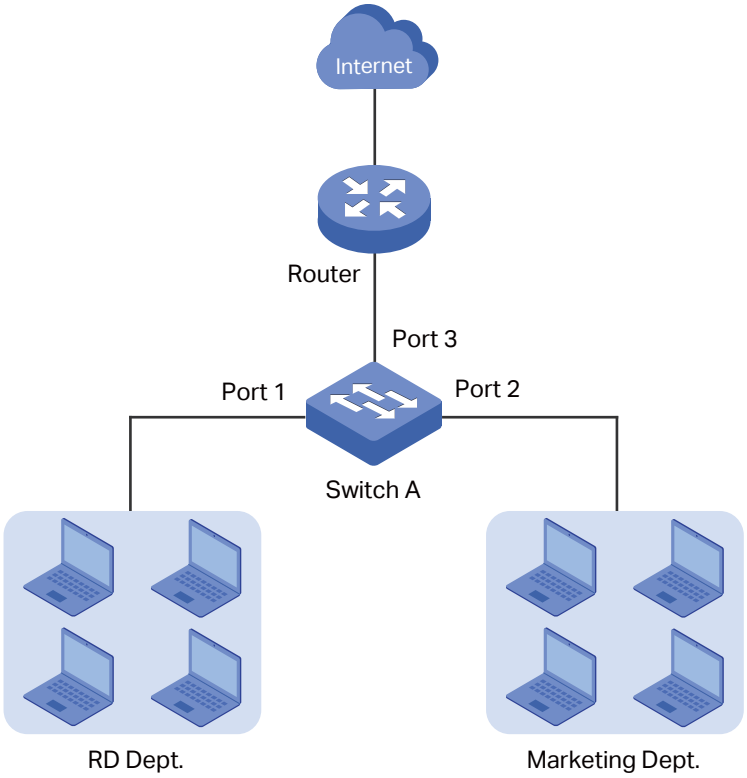
- For a port, the storm control feature and the ingress rate control feature cannot be enabled at the same time. If you enable storm control for a port, ingress rate control will be disabled for that port automatically.
- For ports in the same LAG, storm control should be configured the same to ensure a successful port aggregation.

5 Configuration Example for Basic QoS

5.1 Network Requirements

As shown below, both RD department and Marketing department can access the internet. When congestion occurs, the traffic from two departments can both be forwarded and the traffic from the Marketing department should take precedence.

Figure 5-1 Basic QoS Application Topology



5.2 Configuration Scheme

To implement this requirement, you can configure QoS in port-based mode to put the packets from the Marketing department into the queue with the higher weight than the packets from the RD department. Follow these procedures to configure QoS in port-based mode.

1) Enable port-based mode.

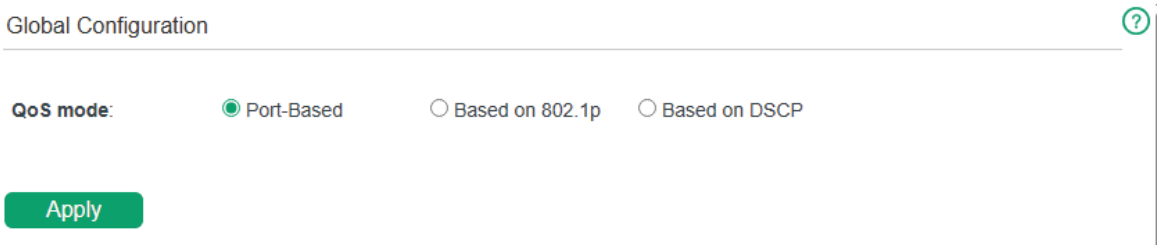
2) Map port 1 and port 2 to different weight.

Demonstrated with a specific model, the following section provides configuration steps.

5.3 Configuration Steps

1) Choose the menu **QoS > QoS Basic** to load the following page. In the **Global Configuration** section, select QoS mode as **Port-based.** Click **Apply**.

Figure 5-2 Configuring Basic QoS in Port-Based Mode



1) In the **Based on Port Settings** section, specify the Priority for Port 1 as 1 and the Priority for Port 2 as 2. Click **Apply**.

Figure 5-3 Configuring Based on Port Settings

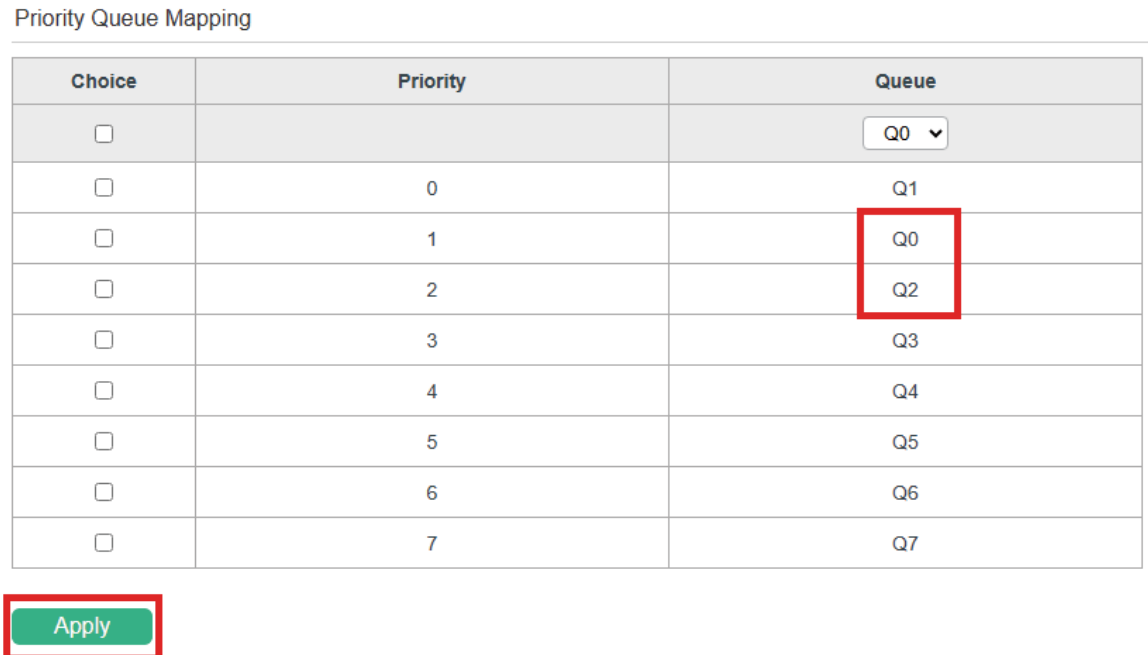
Based on Port Settings

Choice	Port	Priority
☐		0
☐	Port 1	1
☐	Port 2	2
☐	Port 3	0
☐	Port 4	0
☐	Port 5	0
☐	Port 6	0
☐	Port 7	0
☐	Port 8	0

Apply

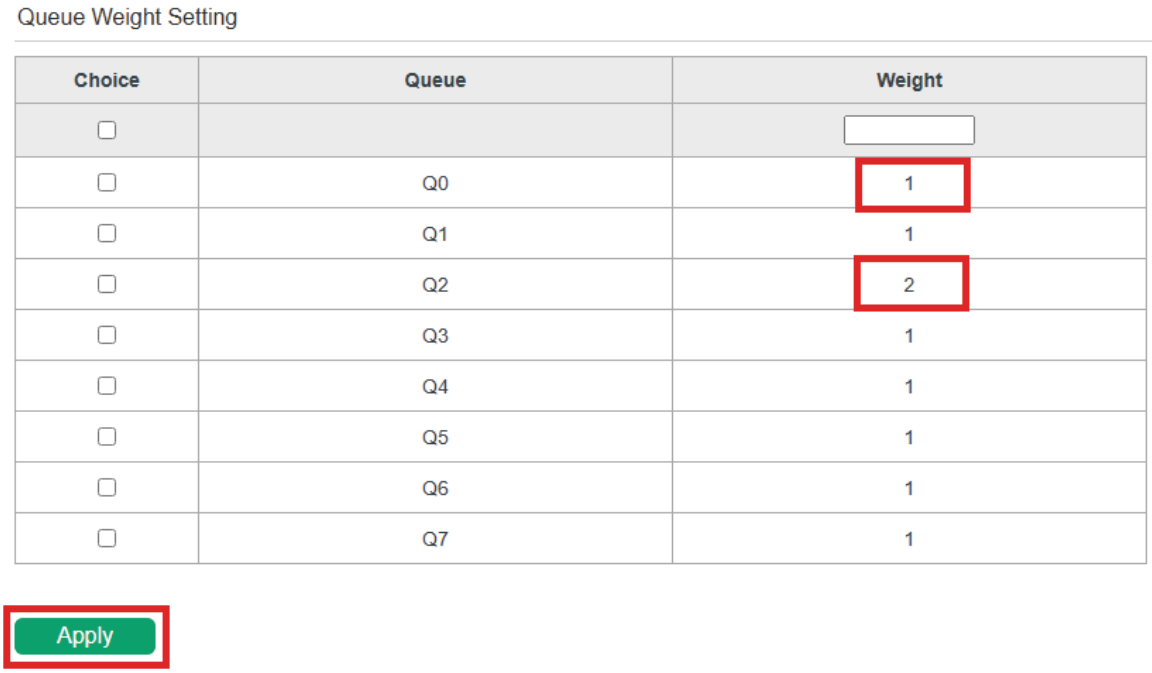
2) In the **Priority Queue Mapping** table, specify the Queue for Priority 1 as Q0 and the Queue for Priority 2 as Q2. Click **Apply**.

Figure 5-4 Configuring Priority Queue Mapping



3) In the **Queue Weight Setting** table, specify the Weight for Queue Q0 as 1 and the Weight for Queue Q2 as 2. Click **Apply**.

Figure 5-5 Configuring Queue Weight Setting



6 Appendix: Default Parameters

Default settings of QoS Basic configuration are listed in the following table.

Table 6-1 Default Settings of QoS Basic Configuration

Parameter	Default Setting
QoS Mode	Port-Based

Default settings of Rate Limit configuration are listed in the following table.

Table 6-2 Default Settings of Rate Limit Configuration

Parameter	Default Setting
Ingress Rate (Kbps)	Unlimited
Egress Rate (Kbps)	Unlimited

Default settings of Storm Control configuration are listed in the following table.

Table 6-3 Default Settings of Storm Control Configuration

Parameter	Default Setting
Status	Disable
Speed	Unlimited

Part 6

Monitoring

CHAPTERS

1 Monitoring

1.1 Overview

With the Monitoring feature, you can monitor the traffic on the switch.

1.2 Supported Features

Traffic Summary

Traffic Summary displays the traffic information of each port, which facilitates you to monitor the traffic and analyze the network abnormity.

Mirroring

Mirroring refers to the process of forwarding copies of packets from one port to a mirroring port. Usually, the mirroring port is connected to a data diagnose device, which is used to analyze the mirrored packets for monitoring and troubleshooting the network.

Cable Test

Cable Test functions to test the cable connection status, length and error length when the cable is connected to the port of the switch, which facilitates you to locate and diagnose the trouble spot of the network.

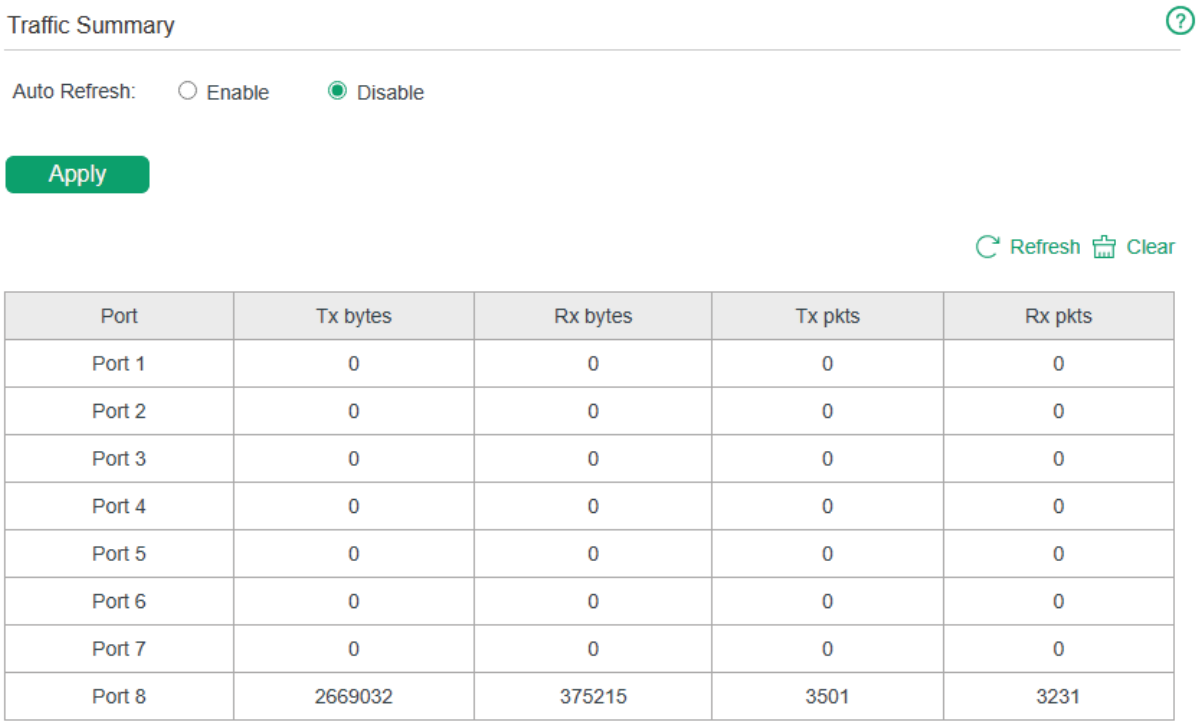
Loop Detection

Loop Dectection is used to detect the loop created by a specific port.

2 Viewing Traffic Summary

Choose the menu **Monitoring > Traffic Summary** to load the following page.

Figure 2-1 Viewing Traffic Summary



Port	Tx bytes	Rx bytes	Tx pkts	Rx pkts
Port 1	0	0	0	0
Port 2	0	0	0	0
Port 3	0	0	0	0
Port 4	0	0	0	0
Port 5	0	0	0	0
Port 6	0	0	0	0
Port 7	0	0	0	0
Port 8	2669032	375215	3501	3231

You can choose to enable or disable Auto Refresh and click **Apply**.

Auto Refresh	With this option enabled, the switch will automatically refresh the traffic summary every 10 seconds.

You can view the statistics of each port. You can click **Refresh** to refresh the data and click **Clear** to clear the data.

Port	Displays the port number of the switch.
Tx bytes	Displays the number of octets transmitted on the port. Error packets are counted.
Rx bytes	Displays the number of octets received on the port. Error packets are counted.
Tx pkts	Displays the number of packets transmitted on the port.
Rx pkts	Displays the number of packets received on the port.

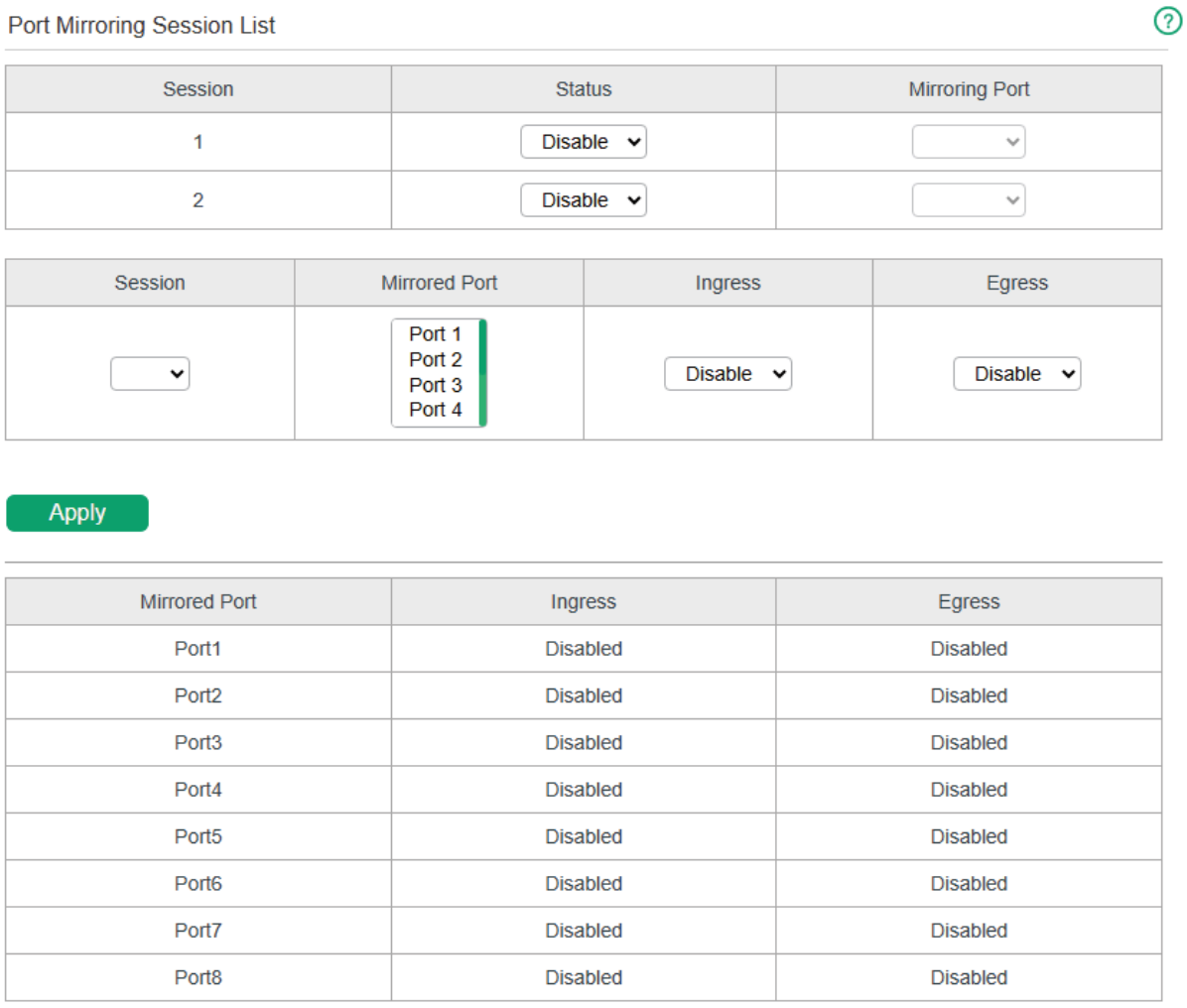
Note:

Because of the supporting feature of jumbo frame, the frames with more than 15360 bytes can not be forwarded.

3 Configuring Mirroring

Choose the menu **Monitoring > Mirroring** to load the following page.

Figure 3-1 Configuring Mirroring



Follow these steps to configure mirroring:

1) Enable the port mirror feature globally. Specify a mirroring port. Click **Apply**.

Session	Displays the session number.
Status	Select to enable/disable the port mirror feature.
Mirroring Port	Select a port from the drop-down list as the mirroring port.

2) Select one or more mirrored ports, enable or disable the ingress packets and egress packets to be mirrored for the ports. Click **Apply**.

Mirrored Port	Select one or multiple desired port(s) as the mirrored port(s).
Ingress	Select to enable/disable the Ingress feature. When the Ingress is enabled, the incoming packets received by the mirrored port will be copied to the mirroring port.
Egress	Select to enable/disable the Egress feature. When the Egress is enabled, the outgoing packets sent by the mirrored port will be copied to the mirroring port.

3) In the table below, you can verify the configuration result for port mirroring.

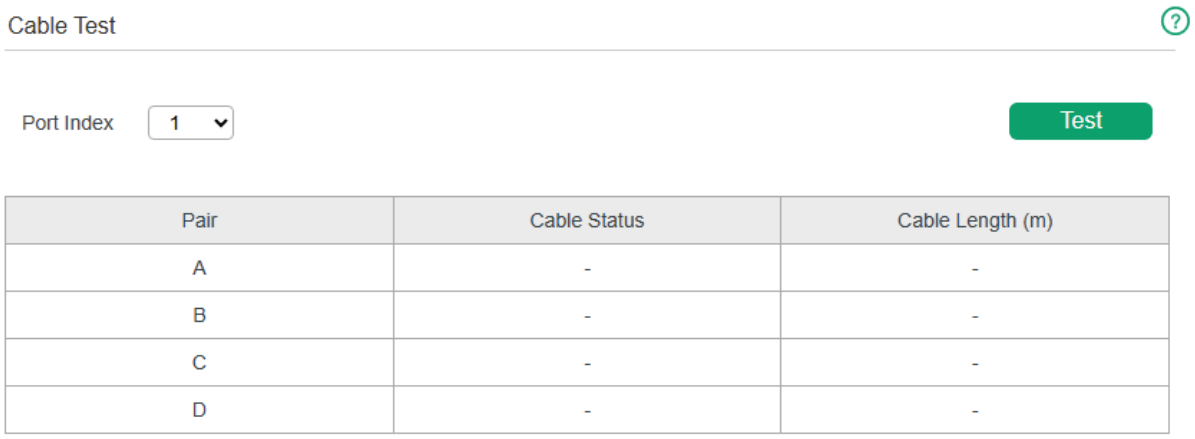
Note:

The LAG member ports cannot be set as a mirroring port but a mirrored port.

4 Testing Cables

Choose the menu **Monitoring > Cable Test** to load the following page.

Figure 4-1 Cable Test



Follow these steps to diagnose the cable:

1) Select a desired port for test. Click **Test** to test cables connected to the selected port.

Port Index	Select the port for cable testing.

2) Check the test results in the table.

Pair	Displays the cable pairs.
Cable Status	Displays the cable test results.
Cable Length	If the connection status is Normal, here displays the length of the cable. If the connection status is Close (or Short), Open or Crosstalk, here displays the length from the port to the trouble spot.

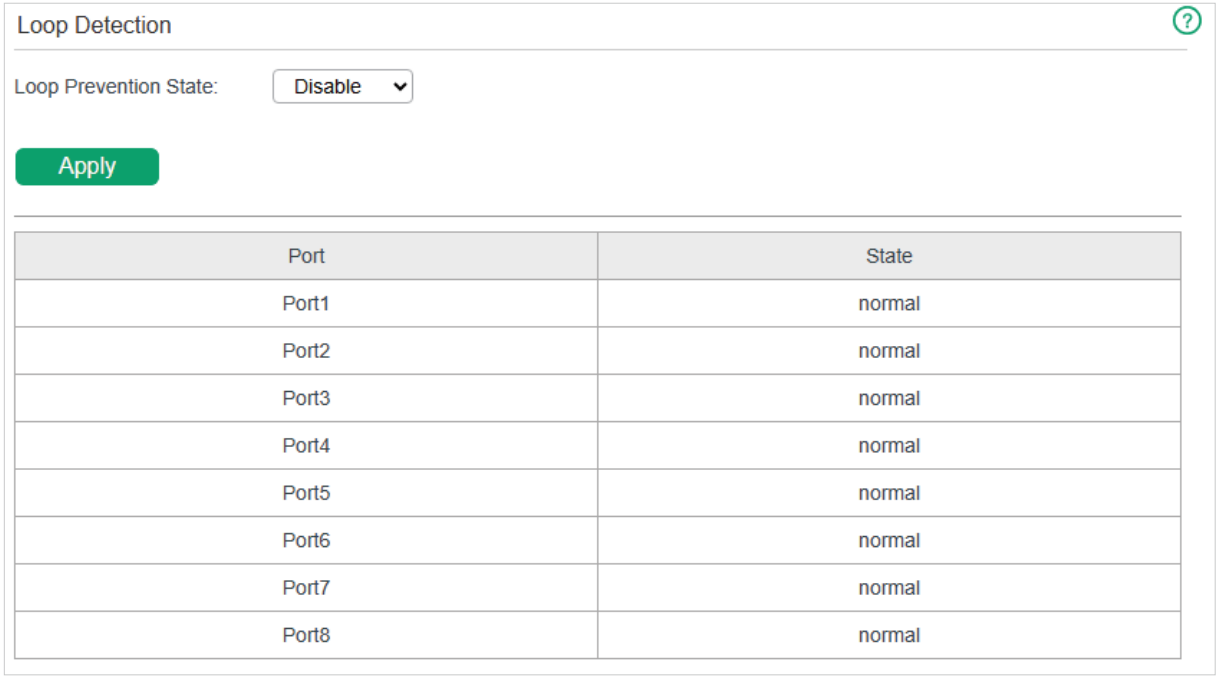
Note:

Cable diagnostic is only supported for 1G speed.

5 Configuring Loop Prevention

Choose the menu **Monitoring > Loop Detection** to load the following page.

Figure 5-1 Configuring Loop Prevention



Follow these steps to configure loop prevention:

1) Enable or disable loop prevention. Click **Apply**.

Loop prevention state	Enable or disable the loop prevention feature.

2) In the table below, you can check the state of each port.

Port	Displays the physical port number of the switch.
State	Displays the port status.

Note:

When a port detects loopback, the port will be automatically blocked.

6 Appendix: Default Parameters

Default settings of Traffic Summary are listed in the following table.

Table 6-1 Default Settings of Port Mirrror Configuration

Parameter	Default Setting
Auto Refresh	Disable

Default settings of Mirroring are listed in the following table.

Table 6-2 Default Settings of Port Mirrror Configuration

Parameter	Default Setting
Mirroring Status	Disable
Ingress	Disable
Egress	Disable

Default settings of Cable Test are listed in the following table.

Table 6-3 Default Settings of Port Mirrror Configuration

Parameter	Default Setting
Port Index	1

Default settings of Loop Prevention are listed in the following table.

Table 6-4 Default Settings of Loop Preventikon Configuration

Parameter	Default Setting
Loop prevention state	Disable

Part 7

Configuring STP/RSTP

CHAPTERS

1 Spanning Tree

1.1 Overview

In the Spanning Tree module, you can configure Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP).

Spanning Tree Protocol (STP) is a Layer 2 protocol that prevents loops in the network. It helps to ensure a loop-free topology both initially or after topology changes by changing the state of ports. STP can protect the network from broadcast storms and the damage to MAC address.

Rapid Spanning Tree Protocol (RSTP) is a technological improvement on STP. RSTP provides a much faster speed of spanning tree convergence than STP.

1.2 Supported Features

STP Config

You can enable the spanning tree function globally, choose the spanning tree mode and configure the global parameters for spanning tree.

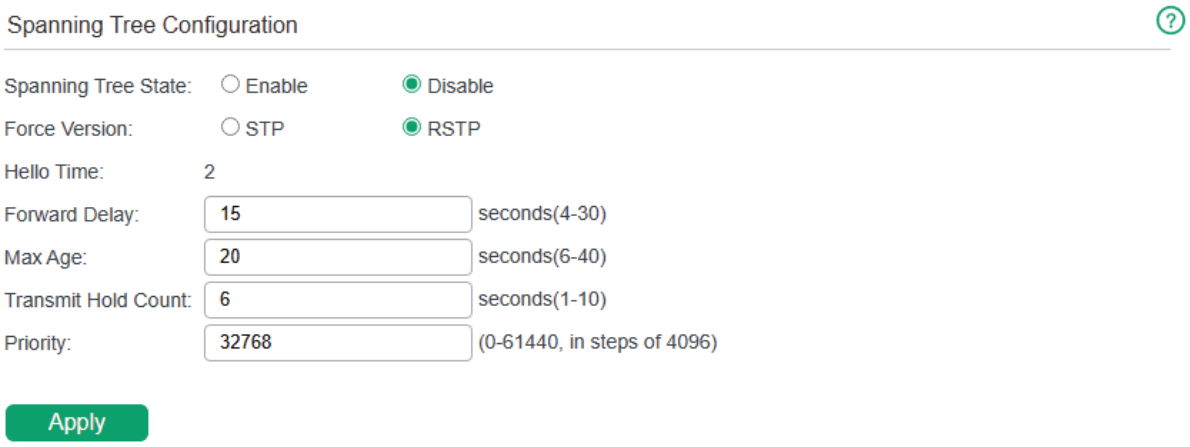
Port Config

You can view and configure the parameters of the ports. A spanning tree is generated by comparing multiple parameters between different switches and ports and by determining their roles. For a targeted topology, it is necessary to specify these parameters manually.

2 Configuring STP

Choose the menu **Spanning Tree > STP Config** to load the following page.

Figure 2-1 Configuring STP



Follow these steps to configure STP:

1) Enable Spanning Tree globally and select the Force Version as STP or RSTP.

Spanning Tree State	Enable or disable the spanning tree function globally.
Force Version	Select the spanning tree mode as STP or RSTP. STP: STP is the basic spanning tree protocol based on IEEE 802.1d. RSTP: RSTP has the same function as STP, but it can speed up the spanning tree convergence.

2) Configure the global parameters. Click **Apply**.

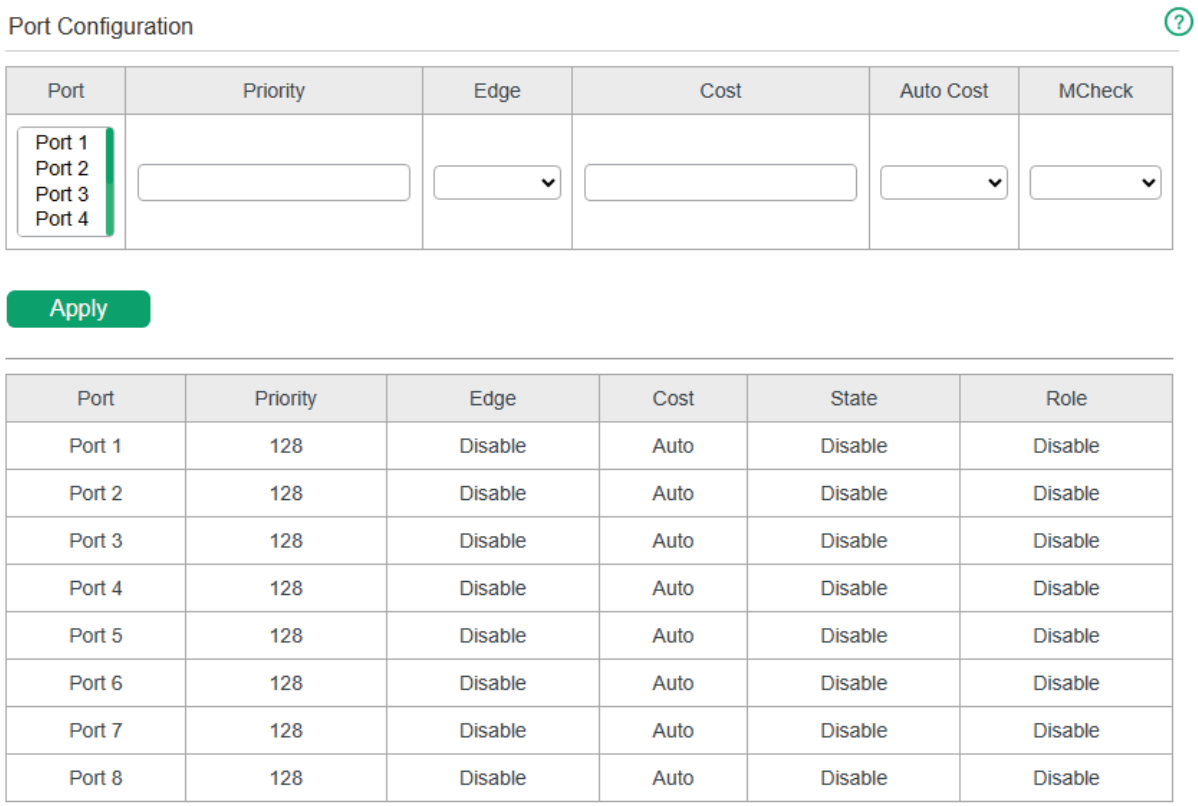
Hello Time	Specify the interval between BPDUs' sending. It works with the MAX Age to test the link failures and maintain the spanning tree.
Forward Delay	Specify the interval between the port state transition from listening to learning. It is used to prevent the network from causing temporary loops during the regeneration of spanning tree. The interval between the port state transition from learning to forwarding is also the Forward Delay.

Max Age	Specify the maximum time that the switch can wait without receiving a BPDU before attempting to regenerate a new spanning tree.
Transmit Hold Count	Specify the maximum number of BPDU that can be sent in a second.
Priority	Specify the priority for the switch. Priority is used to determine the root bridge for spanning tree. The switch with the lower value has the higher priority. It is the priority of the switch in spanning tree. The switch with the highest priority will be elected as the root bridge.

3 Configuring Ports

Choose the menu **Spanning Tree > Port Config** to load the following page.

Figure 3-1 Configuring Ports



Port	Priority	Edge	Cost	State	Role
Port 1	128	Disable	Auto	Disable	Disable
Port 2	128	Disable	Auto	Disable	Disable
Port 3	128	Disable	Auto	Disable	Disable
Port 4	128	Disable	Auto	Disable	Disable
Port 5	128	Disable	Auto	Disable	Disable
Port 6	128	Disable	Auto	Disable	Disable
Port 7	128	Disable	Auto	Disable	Disable
Port 8	128	Disable	Auto	Disable	Disable

Follow these steps to configure the ports:

1) Select one or more ports and configure the Priority, Edge, Cost, Auto Cost, and MCheck for the port(s).

Port	Select one or more ports to configure.
Priority	Specify the Priority for the desired port. The value should be an integral multiple of 16, ranging from 0 to 240. Ports with lower values have higher priority. When the root path of the port is the same as other ports', the switch will compare the port priorities and select a root port with the highest priority.

Edge	Enable or disable the port to be an edge port. When the topology is changed, the edge port can transit its state from blocking to forwarding directly. For the quick generation of the spanning tree, it is recommended to set the ports that are connected to the end devices as edge ports.
Cost	Enter the value of the cost. The valid values are from 0 to 2000000. Cost indicates the path cost of the port in spanning tree. The port with the lowest root path cost will be elected as the root port of the switch.
Auto Cost	Enable or disable Auto Cost. Auto Cost is enabled by default, which means the port calculates the cost automatically according to the port's link speed.
MCheck	Perform MCheck operations on the port. If a port on an RSTP-enabled device is connected to an STP-enabled device, the port will switch to STP compatible mode and send packets in STP format. MCheck is used to switch the mode of the port back to RSTP after the port is disconnected from the STP-enabled device. The MCheck function will take effect immediately after clicking Apply. Every time the situation above happens, you need to do the MCheck action manually.

2) In the table below, you can view the configuration result of each port.

Priority	Displays the priority of each port.
Edge	Displays whether the port is an edge port or not.
Cost	Displays as Auto when Auto Cost is enabled and as the specified cost when Auto Cost is disabled.

State	Displays the port state. Forwarding: The port receives and sends BPDUs, and forwards user traffic. Learning: The port receives and sends BPDUs. It also receives user traffic, but doesn't forward the traffic. Blocking: The port only receives and sends BPDUs. Discard: The port is not connected to any device. Disable: Indicates that the port is not participating in the spanning tree.
Role	Displays the role that the port plays in the spanning tree. Root Port: Indicates that the port is the root port in the spanning tree. It has the lowest path cost from the root bridge to this switch and is used to communicate with the root bridge. Designated Port: Indicates that the port is the designated port in the spanning tree. It has the lowest path cost from the root bridge to this physical network segment and is used to forward data for the corresponding network segment. Alternate Port: Indicates that the port is the alternate port in the spanning tree. It is the backup of the root port. Backup Port: Indicates that the port is the backup port in the spanning tree. It is the backup of the designated port. Disable: Indicates that the port is not participating in the spanning tree.

4 Appendix: Default Parameters

Default settings of STP Config are listed in the following tables.

Table 4-1 Default Settings of STP Config

Parameter	Default Setting
Spanning Tree State	Disable
Force Version	RSTP
Hello Time	2
Forward Delay	15
Max Age	20
Transmit Hold Count	6
Priority	32768

Default settings of Port Config are listed in the following tables.

Table 4-2 Default Settings of Port Config

Parameter	Default Setting
Priority	128
Edge	Disable
Cost	Auto
State	Disable
Role	Disable

Part 8

System Tools

CHAPTERS

1 System Tools

1.1 Overview

In System Tools module, you can upgrade the firmware, back up and restore configuration, reset and reboot the switch.

1.2 Supported Features

System Upgrade

The switch system can be upgraded to get more functions and better performance.

Backup Restore

The switch configuration can be backed up and saved as a file to your computer, and restored later.

System Reset

The switch can be reset to factory settings.

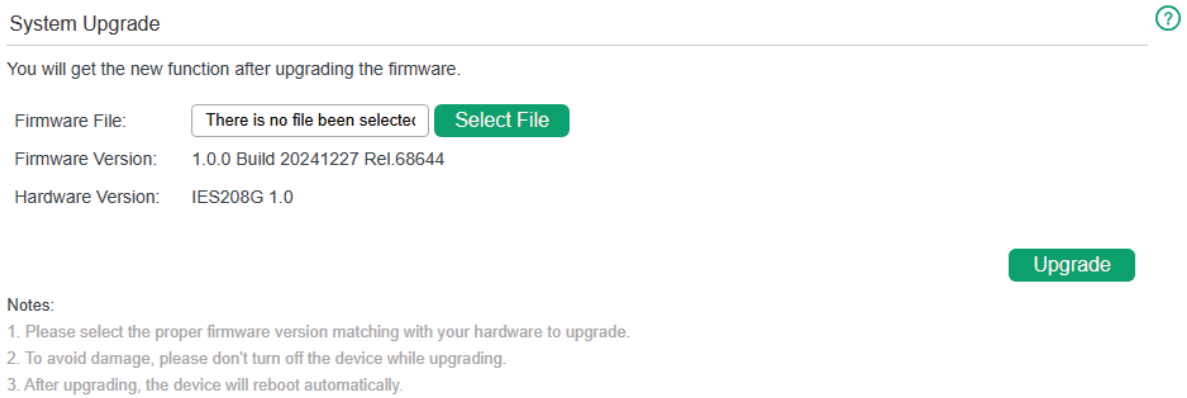
System Reboot

The switch can be manually rebooted.

2 Upgrading the Firmware

Choose the menu **System Tools > System Upgrade** to load the following page.

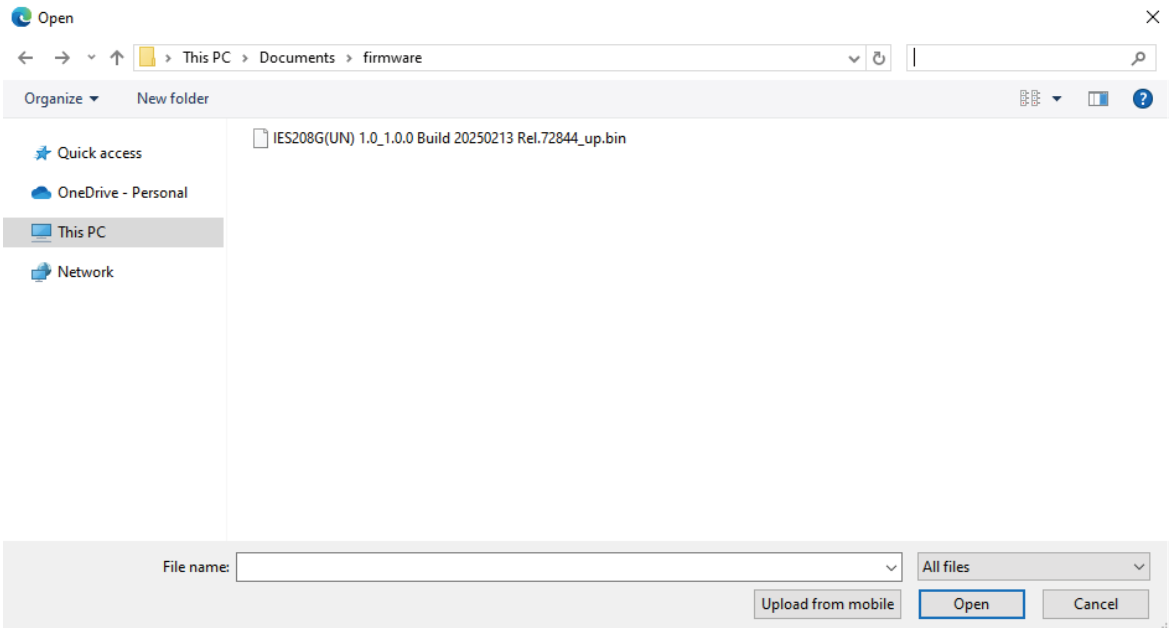
Figure 2-1 Being Ready to Upgrade the Firmware



Follow these steps to upgrade the firmware:

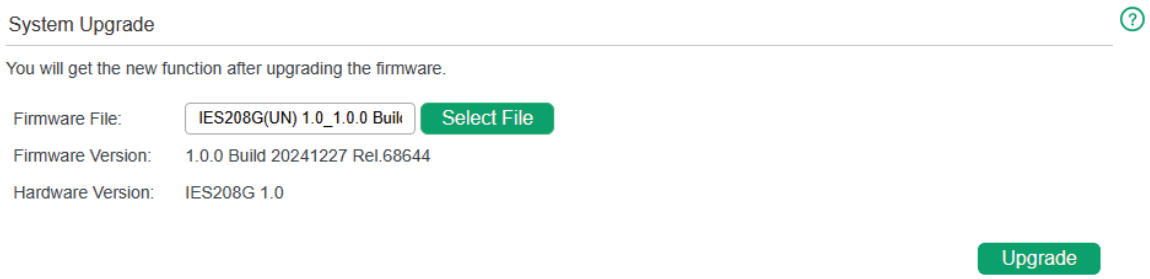
1) Click **Select File** to load the following page. Specify the firmware file path and select the firmware to upgrade.

Figure 2-2 Browsing the Firmware File



2) Click **Open** and the following page will be displayed. Click **Upgrade**.

Figure 2-3 Upgrading the Firmware



Note:

- It will take several minutes to upgrade the firmware. Wait without any operation.
- Select the proper software version matching with the hardware to upgrade.
- To avoid damage, do not power down the switch while upgrading the firmware.
- It is recommended to backup the configuration before upgrading.

3 Backing up and Restoring the Switch

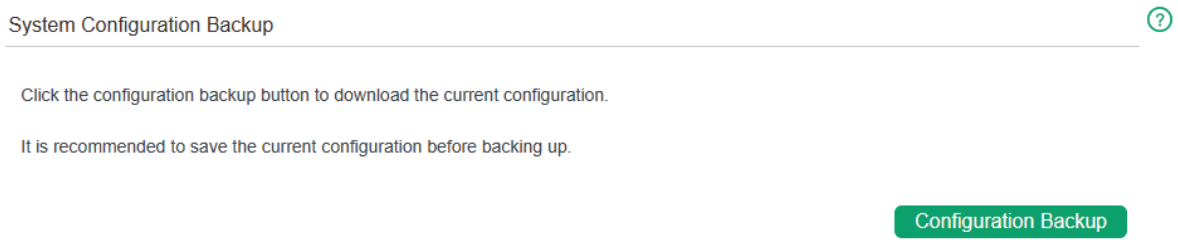
With backup and restore, you can:

- Save the current configuration.
- Restore to the previous configuration.

3.1 Saving the Current Configuration

Choose the menu **System Tools > Backup Restore** to load the following page. In the **System Configuration Backup** section, click **Configuration Backup** to save the configuration file to your PC.

Figure 3-1 Backing Up the Configuration



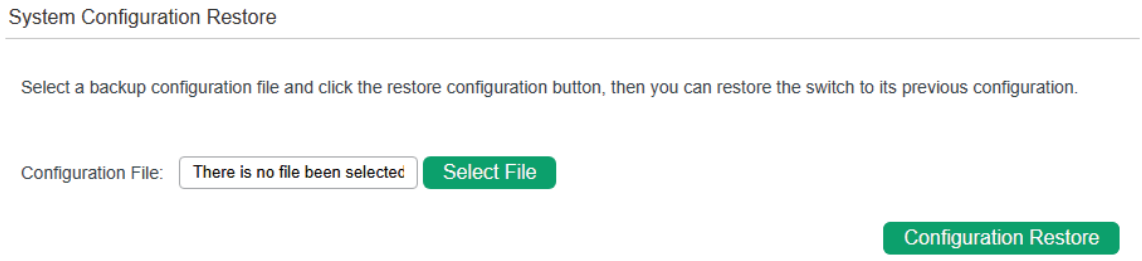
Note:

It will take several minutes to save the configuration file. Wait without any operation.

3.2 Restoring to the Previous Configuration

Choose the menu **System Tools > Backup Restore** to load the following page.

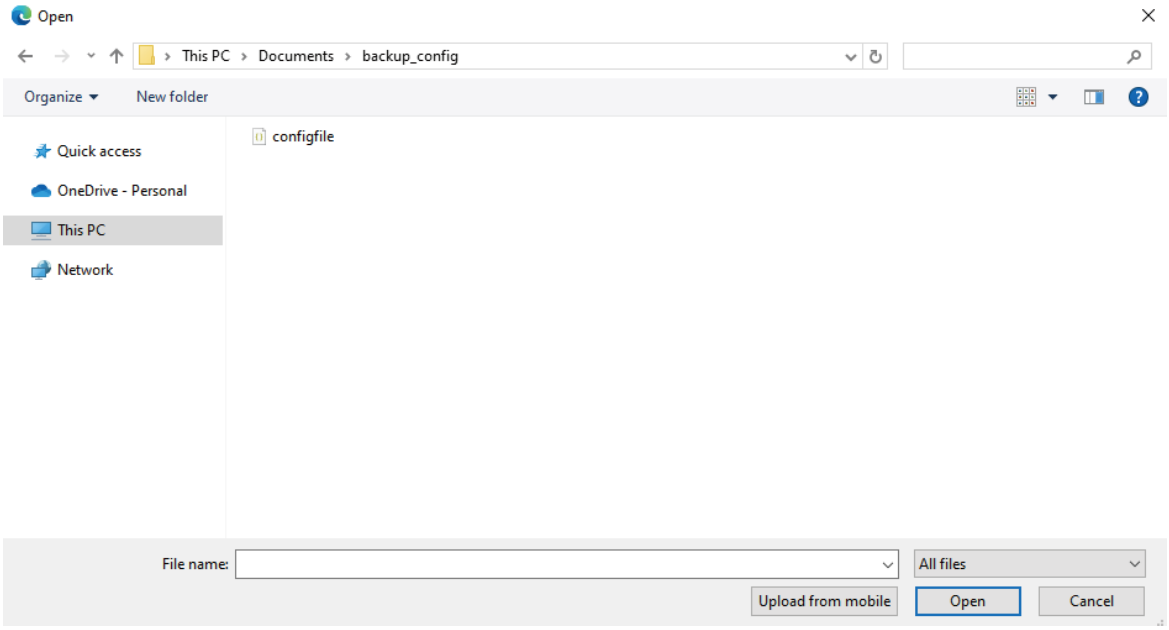
Figure 3-2 Restoring the Configuration



Follow these steps to restore the switch to the previous configuration:

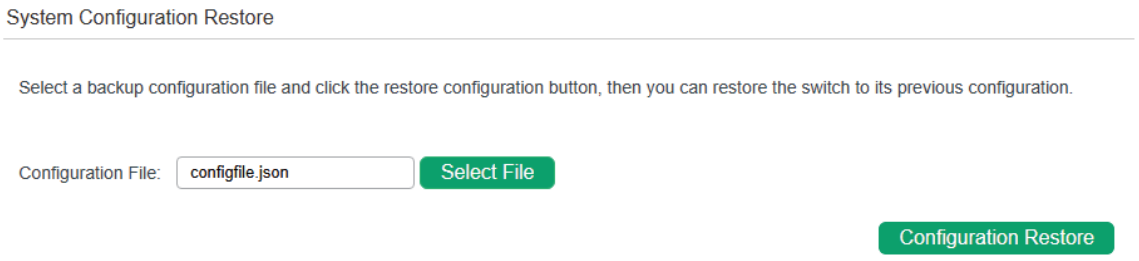
1) In the **System Configuration Restore** section, click **Select File** to load the following page. Specify the configuration file path and select the configuration file.

Figure 3-3 Choosing the Configuration File



2) Click **Open** and the following page will be displayed. In the **System Configuration Restore** section, click **Configuration Restore** to restore the switch to the previous configuration. It will take effect after the switch automatically reboots.

Figure 3-4 Restoring to the Previous Configuration



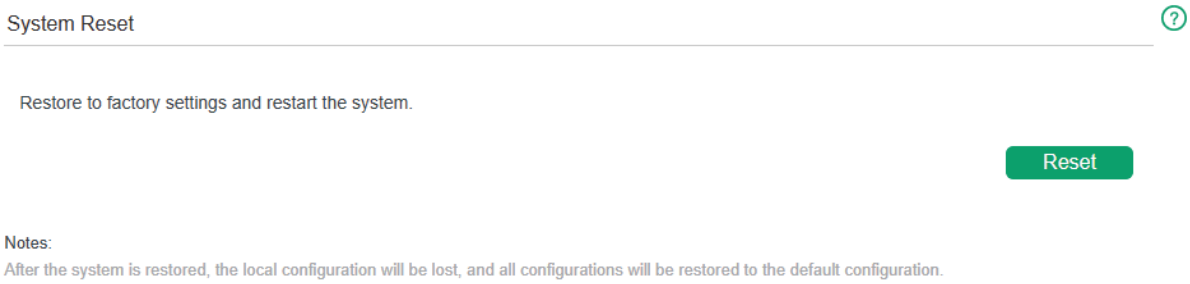
Note:

- It will take several minutes to restore the configuration. Wait without any operation.
- To avoid any damage, do not power down the switch while being restored.
- After being restored, the current configuration of the switch will be lost.

4 Resetting the Switch

Choose the menu **System Tools > System Reset** to load the following page.

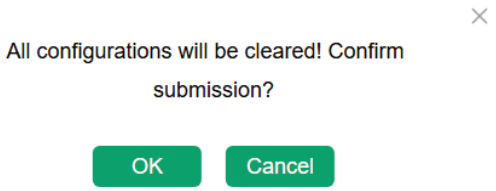
Figure 4-1 Resetting the Switch



Follow these steps to reset the switch.

1) Click **Reset**, and the following page will pop up.

Figure 4-2 Confirming Reset Operation



2) Click **OK** to reset the switch.

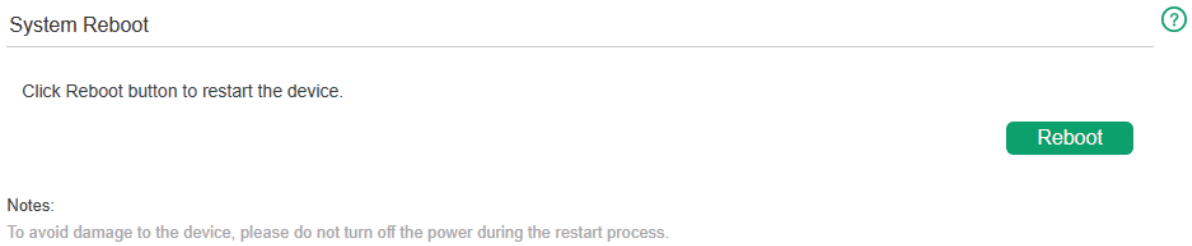
Note:

- After the switch is reset, it will reboot automatically.
- It will take several minutes to reboot the switch. Wait without any operation while the switch reboots.
- To avoid any damage, do not power down the switch during the reset.
- After the switch is reset, all the settings will be restored to the default.

5 Rebooting the Switch

Choose the menu **System Tools > System Reboot** to load the following page. Click **Reboot**.

Figure 5-1 Rebooting the Switch



Note:

- It will take several minutes to reboot the switch. Wait without any operation while the switch reboots.
- To avoid any damage, do not power down the switch while the switch reboots.

Part 9

Configuring Alert

CHAPTERS

1 Alert

1.1 Overview

In the Alert module, you can configure the power alert or port alert function to monitor the power or port status of the switch.

Note:

For detailed specifications on fault relay, refer to the product datasheet.

1.2 Supported Features

Power Alert

When Power Alert is enabled, the power status will be monitored. When the switch has a dual power supply, an alarm will be triggered if one or both of the power supply fails, and the relay will change to an open state until the fault is cleared or the alert function is disabled. The function is enabled by default.

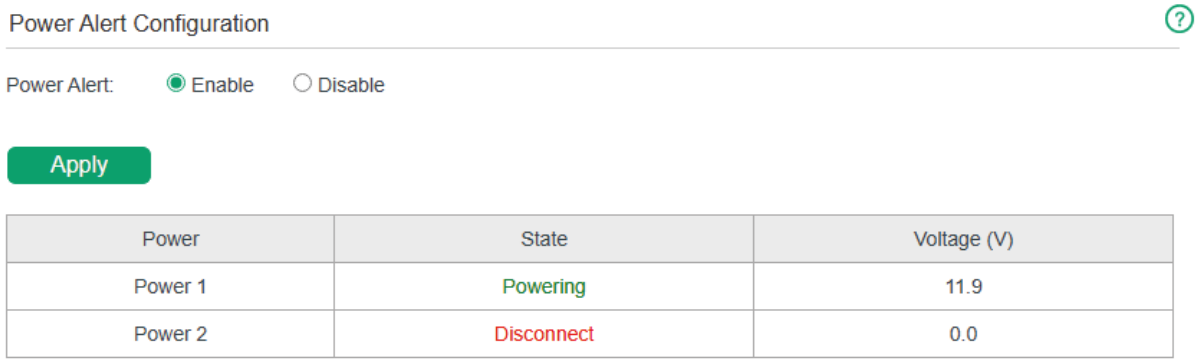
Port Alert

When Port Alert is enabled, the port status will be monitored. When a port has a “Link down” status, an alarm will be triggered and the relay will change to an open state until the fault is cleared or the alert function is disabled. The Port Alert function can be configured for each port respectively. The function is disabled by default.

2 Configuring Power Alert

Choose the menu **Alert > Power Alert** to load the following page.

Figure 2-1 Configuring Power Alert



Follow these steps to configure power alert:

1) Enable or disable Power Alert and click **Apply**.
2) In the table below, you can view the power state and voltage.

State	Displays the power status. Powering: Indicates normal power supply. Standby: Indicates power sources connected but not supplying power. Disconnect: Indicates no power sources.
Voltage (V)	Displays the voltage of the corresponding power.

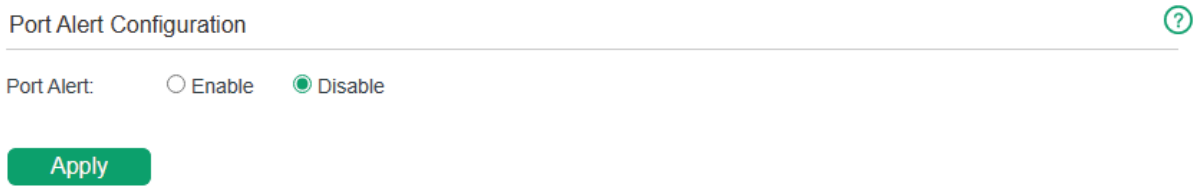
Note:

The switch with a single power supply will not have the alarm triggered even with Power Alert enabled. When the switch has a dual power supply, the power status will be monitored and the alarm will be triggered if one of the power supply fails.

3 Configuring Port Alert

Choose the menu **Alert > Port Alert** to load the following page.

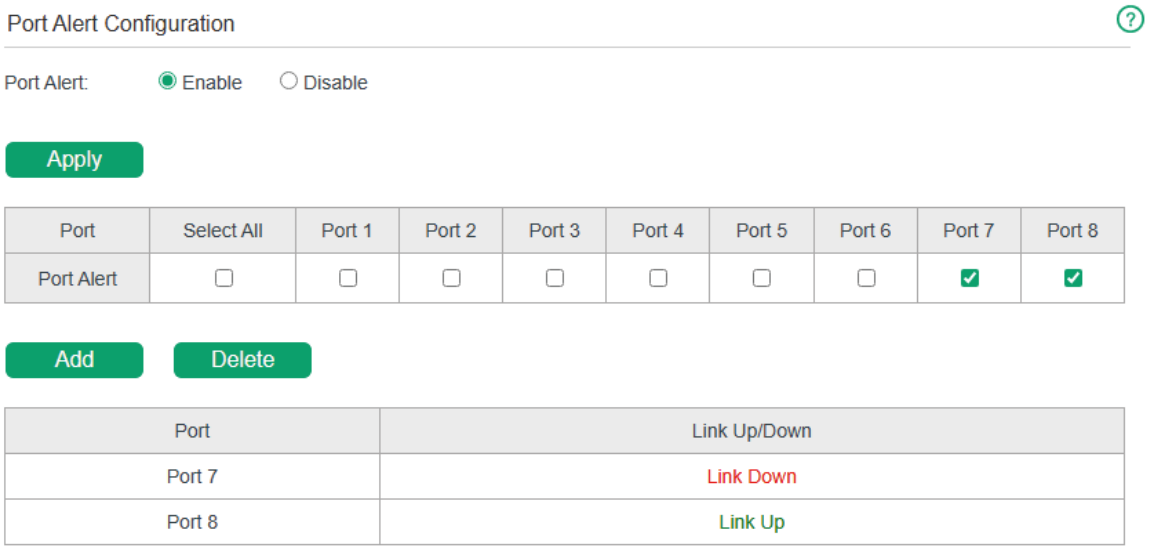
Figure 3-1 Configuring Port Alert



Follow these steps to configure port alert:

1) Enable Port Alert and click **Apply**.
2) Select one or more ports and click **Add** for port alert. You can also click **Delete** to disable port alert for the specific port(s).
3) In the table below, you can view the status of the ports with Port Alert enabled.

Figure 3-2 Adding Ports for Port Alert



Link up/ down	Displays the status of the ports with Port Alert enabled.

Note:

The switch will not have the alarm triggered when the ports with Port Alert enabled are not connected to devices. Only when the ports are in “Link up” status will they be monitored and the alarm will be triggered when they become “Link down”.

4 Appendix: Default Parameters

Default settings of Power Alert are listed in the following tables.

Table 4-1 Default Settings of Power Alert

Parameter	Default Setting
Power Alert	Enable

Default settings of Port Alert are listed in the following tables.

Table 4-2 Default Settings of Port Alert

Parameter	Default Setting
Port Alert	Disable

Part 10

Controller Settings

CHAPTERS

1 Controller Settings

1.1 Overview

With the Controller Settings module, you can enable the switch to be discovered and then be managed centrally by the Omada Controller.

1.2 Supported Features

Cloud-Based Controller Management

By enabling Cloud-Based Controller Management, you can configure your switch via the Omada Cloud-Based Controller and enjoy centralized management.

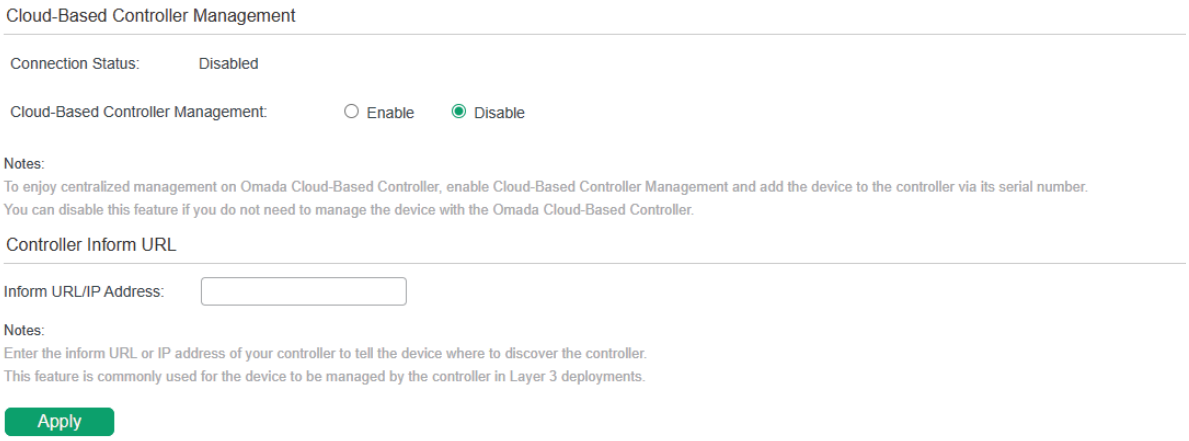
Controller Inform URL

By entering the Inform URL/IP Address of the controller, you can allow the switch to be discovered by the controller via this address.

2 Configuring Controller Settings

Choose the menu **Controller Settings > Controller Settings** to load the following page.

Figure 2-1 Configuring Controller Settings



Follow these steps to configure controller settings:

1) Select Cloud-Based Controller Management as **Enable**. Click **Apply**.

Connection Status	Displays the status of the connection between the switch and the Omada Cloud-Based Controller. Disabled: Cloud-Based Controller Management is disabled. Online: The switch is connected to the Omada Cloud and not managed by the Cloud-Based Controller yet. Offline: The switch is not connected to the Omada Cloud.
Cloud-Based Controller Management	Enable or disable Omada Cloud-Based Controller Management. With this feature enabled, the switch can communicate with the Omada Cloud Platform.

2) Specify the inform URL or IP address of the controller. Click **Apply**.

Inform URL/IP Address	Enter the inform URL or IP address of your controller to tell the switch where to discover the controller.

Note:

- To enjoy centralized management on the Omada Cloud-Based Controller, enable Cloud-Based Controller Management and add the switch to the controller via its serial number. You can disable Cloud-Based Controller Management if you do not need to manage the device with the Omada Cloud-Based Controller.
- To get the inform URL of the Omada Cloud-Based Controller, click the controller on your Omada Cloud Dashboard to reveal the Properties window, and then go to the Details tab.
- Controller Inform URL is commonly used for the device to be managed by the controller in the Layer 3 deployment.
- Make sure to read the privacy policy before enabling Cloud-Based Controller Management.

3 Appendix: Default Parameters

Default settings of Controller Settings are listed in the following table.

Table 3-1 Default Settings of Controller Settings

Parameter	Default Setting
Cloud-Based Controller Management	Disable
Inform URL/IP Address	Null

Part 11

Configuring PoE

(Only for Certain Devices)

CHAPTERS

1 PoE

1.1 Overview

PoE (Power over Ethernet) is an implementation of power supply of PD (Powered Device) linked to the PoE switch through the RJ-45 port. It is a mechanism which implements power supply and data transmission synchronously.

In the PoE module, you can configure basic settings, PoE auto recovery, and extend mode for the PoE ports of the switch.

Note:

The PoE Config is only available on Industrial Easy Managed Switches with PoE ports. For other non-PoE Switches, this feature is not supported.

1.2 Supported Features

PoE Config

You can configure the general PoE settings for the switch as well as the PoE parameters for each port.

PoE Auto Recovery

PoE Auto Recovery uses ping packets to detect the link status between PoE ports and connected PoE powered devices (PDs). The switch pings the IP addresses of PDs constantly. If a PD loses connection, the switch will reboot it automatically.

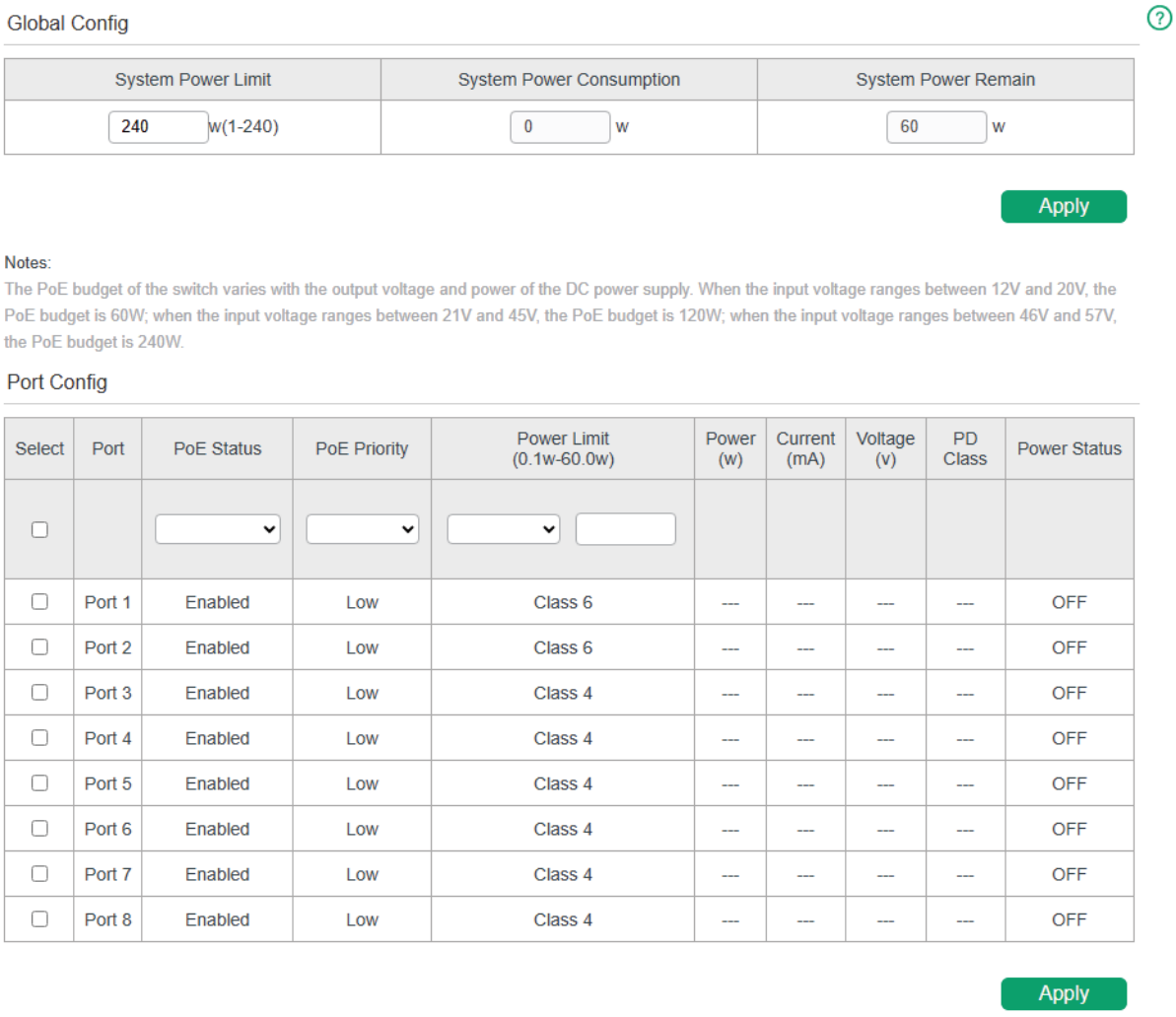
PoE Extend Mode

Extend Mode can increase the transmission distance to support long-distance wiring. When enabled, it extends the maximum transmission distance from 100 m to 250 m but limits the maximum speed to 10 Mbps.

2 Configuring PoE

Choose the menu **PoE > PoE config** to load the following page.

Figure 2-1 Configuring PoE



Follow these steps to configure PoE:

1) In the **Global Config** section, you can view the current PoE parameters. You can configure the System Power Limit. Click **Apply**.

System Power Limit	Specify the maximum power the PoE switch can supply.
System Power Consumption	Displays the real-time system power consumption of the PoE switch.
System Power Remain	Displays the real-time system remaining power of the PoE switch.

2) In the **Port Config** section, select the ports you want to configure and specify the parameters. Click **Apply**.

PoE Status	Enable or disable the PoE function on corresponding ports. A port can supply power to the PD when its status is enable.
PoE Priority	Select the priority level (High, Middle, Low) for the corresponding port. When the supply power exceeds the system power limit, the switch will power off PDs on low-priority ports to ensure stable running of other PDs.
Power Limit (0.1 w-60 w)	Specify the maximum power the corresponding port can supply. The following options are provided: Auto: The maximum power that the port can supply will be adjusted automatically. Class 1: The maximum power that the port can supply is 4 W. Class 2: The maximum power that the port can supply is 7 W. Class 3: The maximum power that the port can supply is 15.4 W. Class 4: The maximum power that the port can supply is 30 W. Class 5: The maximum power that the port can supply is 45 W. Class 6: The maximum power that the port can supply is 60 W. Manual: You can enter a value manually.
Power (w)	Displays the real-time power supply of the port.
Current (mA)	Displays the real-time current of the port.
Voltage (v)	Displays the real-time voltage of the port.
PD Class	Displays the class which the linked PD belongs to.
Power Status	Displays the real-time power status of the port.

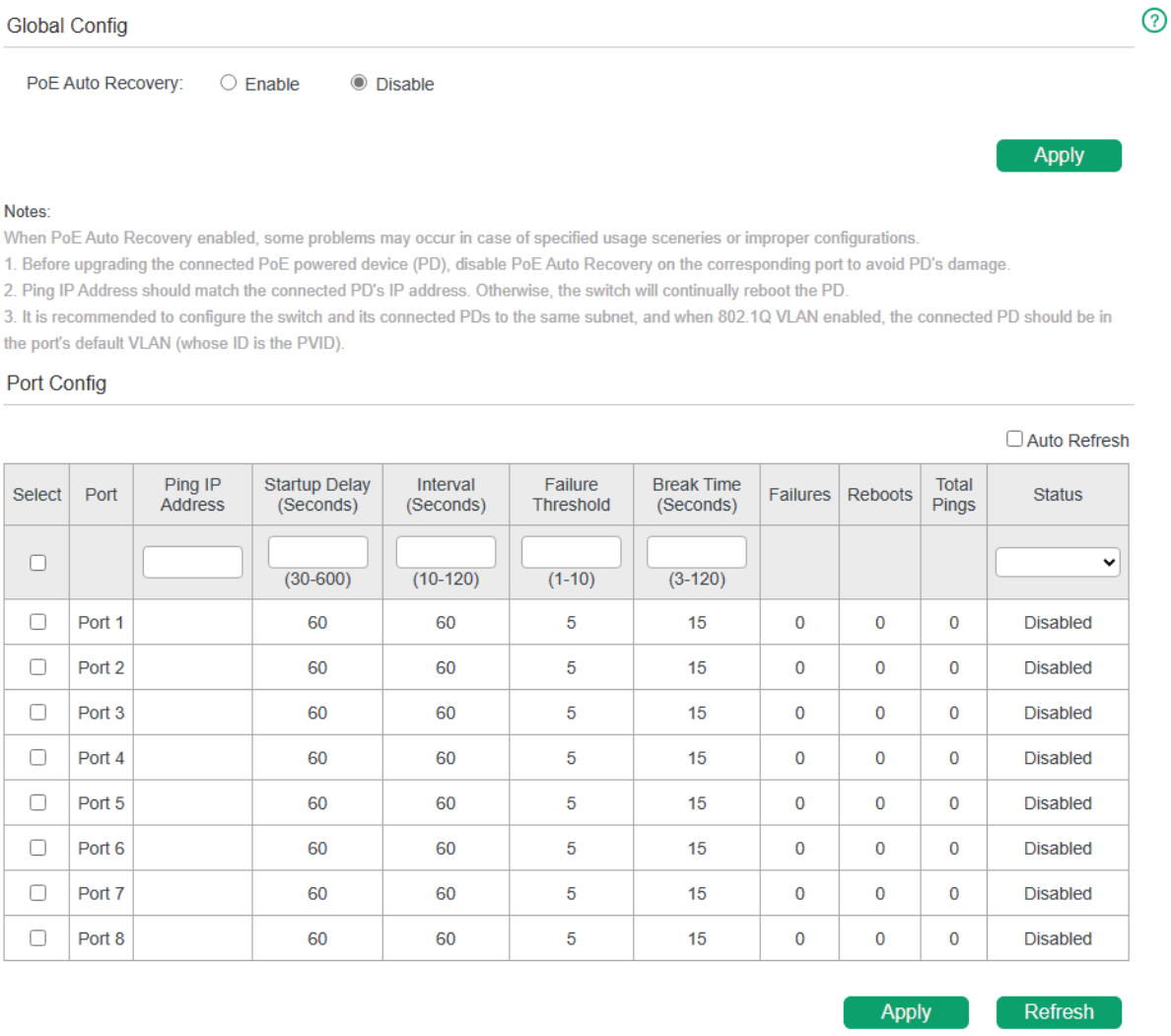
Note:

The PoE budget of the switch varies with the output voltage and power of the DC power supply. Due to the output power limitation of the DC power supply, the switch may not reach its PoE budget even if the output voltage meets the requirements. For the PoE budget details of the specific switch model, refer to the product datasheet.

3 Configuring PoE Auto Recovery

Choose the menu **PoE > PoE Auto Recovery** to load the following page.

Figure 3-1 Configuring PoE Auto Recovery



Follow these steps to enable PoE Auto Recovery and configure the parameters:

1) In the **Global Config** section, enable or disable PoE Auto Recovery. Click **Apply**.

PoE Auto Recovery	Enable or disable PoE Auto Recovery globally.

2) In the **Port Config** section, select the desired ports and specify the parameters. Click **Apply**.

Auto Refresh	When Auto Refresh is enabled, the switch refreshes the data every 5 seconds so you can get the real-time ping statistics.
Ping IP Address	Enter the IP address of the PD connected to the port. Ping IP Address should be the same as the connected PD's IP address. Otherwise, the switch will continually reboot the PD.
Startup Delay	Specify how long the switch waits for the connected PD's rebooting before the switch starts to ping the PD's IP address. It ranges from 30 to 600 seconds.
Interval	Specify the interval between two consecutive ping packets. It ranges from 10 to 120 seconds.
Failure Threshold	Specify the threshold for ping failures. If the switch fails to get the ping response from the PD on the port, the switch will retry until the number of ping failures reaches the threshold, and then the switch will reboot the PD. It ranges from 1 to 10.
Break Time	Specify how soon the switch reboots the PD after the number of ping failures reaches the threshold. It ranges from 3 to 120 seconds.
Failures	Display the number of ping failures since the latest reboot of the PD. It will be reset when the PD responds to the ping packet or is rebooted.
Reboots	Display the number of PD's reboots. It will be reset after reaching 9,999 or when the switch is rebooted.
Total Pings	Display the total number of ping packets that the switch sends to the connected PD. It will be reset after reaching 9,999 or when the switch is rebooted.
Status	Enable or disable PoE Auto Recovery on the desired ports. To make it enabled, enable PoE Auto Recovery both globally and on the port.

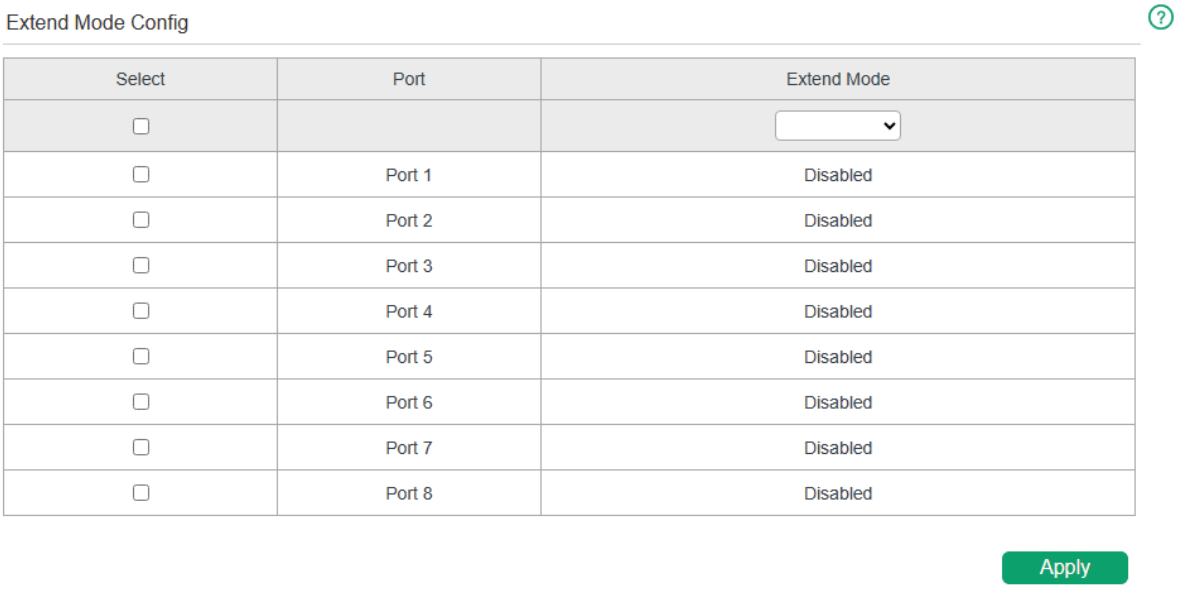
Note:

- When PoE Auto Recovery enabled, some problems may occur in case of specified usage scenarios or improper configurations.
- Before upgrading the connected PoE powered device (PD), disable PoE Auto Recovery on the corresponding port to avoid PD damage.
- Ping IP Address should match the connected PD's IP address. Otherwise, the switch will continually reboot the PD.
- It is recommended to configure the switch and its connected PDs to the same subnet, and when 802.1Q VLAN enabled, the connected PD should be in the port's default VLAN (whose ID is the PVID).

4 Configuring PoE Extend Mode

Choose the menu **PoE > PoE Extend Mode** to load the following page.

Figure 4-1 Configuring Extend Mode



Follow these steps to enable Extend Mode and configure the parameters:

1) In the **Extend Mode Config** section, select the desired ports and choose from the drop-down list to enable or disable **Extend Mode** .

Extend Mode	Select to enable/disable Extend Mode on the desired port.

2) Click **Apply**.

Note:

Enabling Extend Mode on the port extends the maximum transmission distance from 100 m to 250 m and limits the maximum speed to 10 Mbps.

5 Appendix: Default Parameters

Default settings of PoE are listed in the following table.

Table 5-1 Default Settings of PoE

Parameter	Default Setting
Global Config	
System Power Limit	240 W
Port Config	
PoE Status	Enabled
PoE Priority	Low
Power Limit	Class 6 (For PoE++ ports) Class 4 (For PoE+ ports)

Default settings of PoE Auto Recovery are listed in the following table.

Table 5-2 Default Settings of PoE Auto Recovery

Parameter	Default Setting
Global Config	
PoE Auto Recovery	Disable
Port Config	
Ping IP Address	Null
Startup Delay	60 seconds
Interval	60 seconds
Failure Threshold	5
Break Time	15 seconds
Status	Disabled

Default settings of Extend Mode are listed in the following table.

Table 5-3 Default Settings of Extend Mode

Parameter	Default Setting
Extend Mode	Disabled