User Guide

Easy Smart Configuration Utility

TL-SG108PE/TL-SG1016DE/TL-SG1016PE/TL-SG1024DE/TL-SG1218MPE

1910012538 REV3.3.0

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About This Guide

This Configuration Guide provides information for setup and guidance of the Easy Smart Configuration Utility. Read this guide carefully before operation.

Intended Readers

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

Conventions

Some models featured in this guide may be unavailable in your country or region. For local sales information, visit *https://www.tp-link.com*.

When using this guide, notice that features of the switch may vary slightly depending on the model and software version you have. All screenshots, images, parameters and descriptions documented in this guide are used for demonstration only. Throughout the guide, we will take TL-SG1016PE as the switch to configure for example.

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:

The symbol ☛ stands for *Note*. Notes contain suggestions or references that help you make better use of your device.

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.

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

More Information

- The latest software and documentations can be found at Download Center at *https://www.tp-link.com/support*.
- The Installation Guide (IG) can be found inside the package of the switch or at Download Center at *https://www.tp-link.com/support*.
- Specifications can be found at Download Center at *https://www.tp-link.com/support*.

- To ask questions, find answers, and communicate with TP-Link users or engineers, visit *https://community.tp-link.com* to join TP-Link Community.
- Our Technical Support contact information can be found on the Contact Technical Support page at *https://www.tp-link.com/support*.

Part 1

Getting Started

CHAPTERS

1. Introduction
2. Installing the Configuration Utility
3. Discovering Switches

1 Introduction

The Easy Smart Configuration utility allows users to centrally configure the Easy Smart Switches in the entire network. In this part, we will introduce how to install the utility software and discover switches.

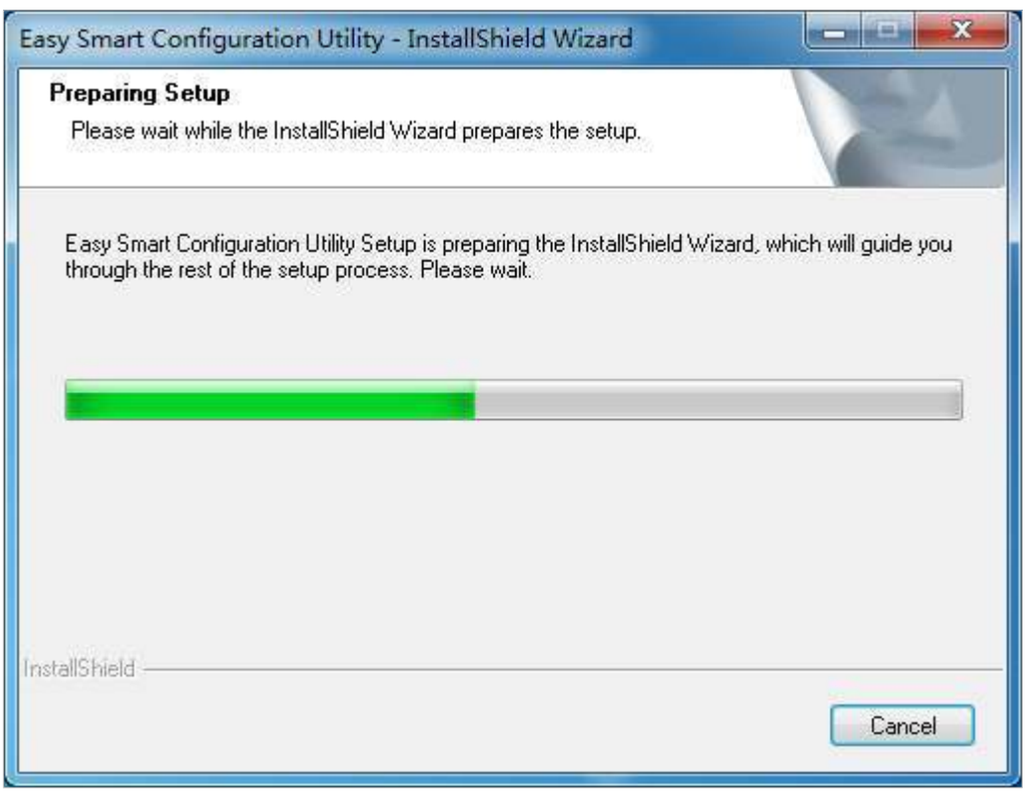
You can also configure Easy Smart Switches individually on their web management page. For more details, refer to the User Guide of the products at Download Center at *https://www.tp-link.com/support*.

2 Installing the Configuration Utility

Follow these steps to install the Easy Smart Configuration Utility:

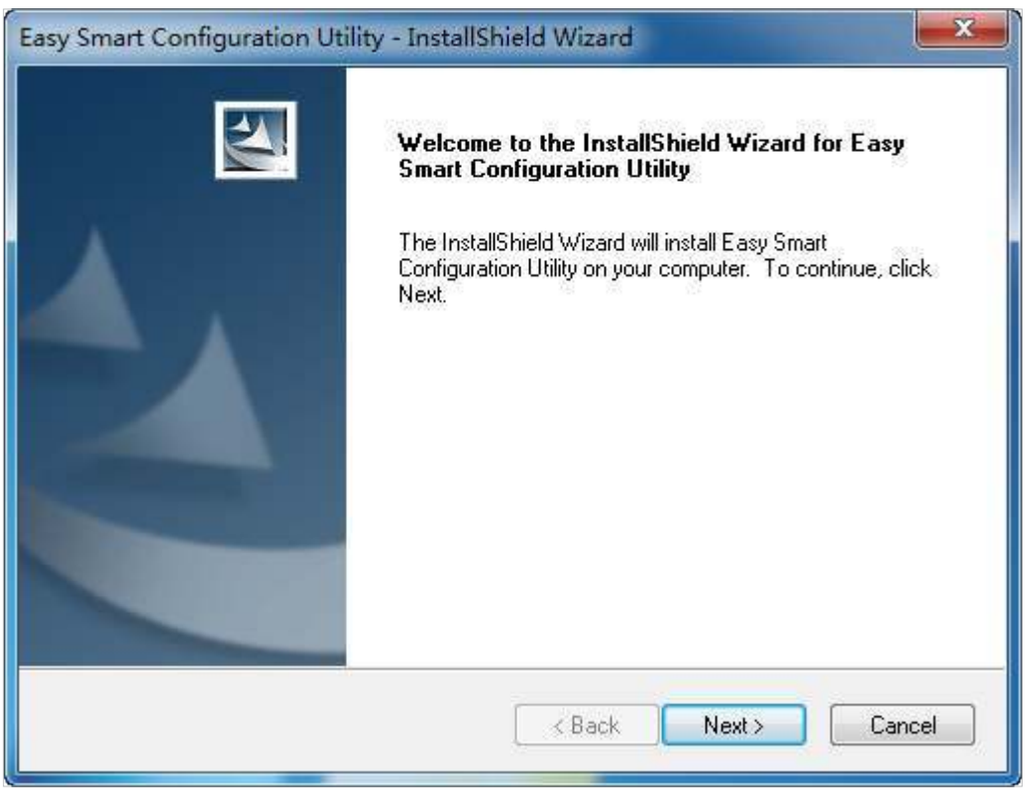
1) Download the software installation packet of Easy Smart Configuration Utility onto your computer. You can find the packet on the product page of the switch at *https://www.tp-link.com*.
2) Decompress the packet and double click **Easy Smart Configuration Utility v1.1.2.0.exe** to launch the InstallShield Wizard. The following page will be displayed.

Figure 2-1 Preparing Setup



3) Wait a moment until the following page is displayed.

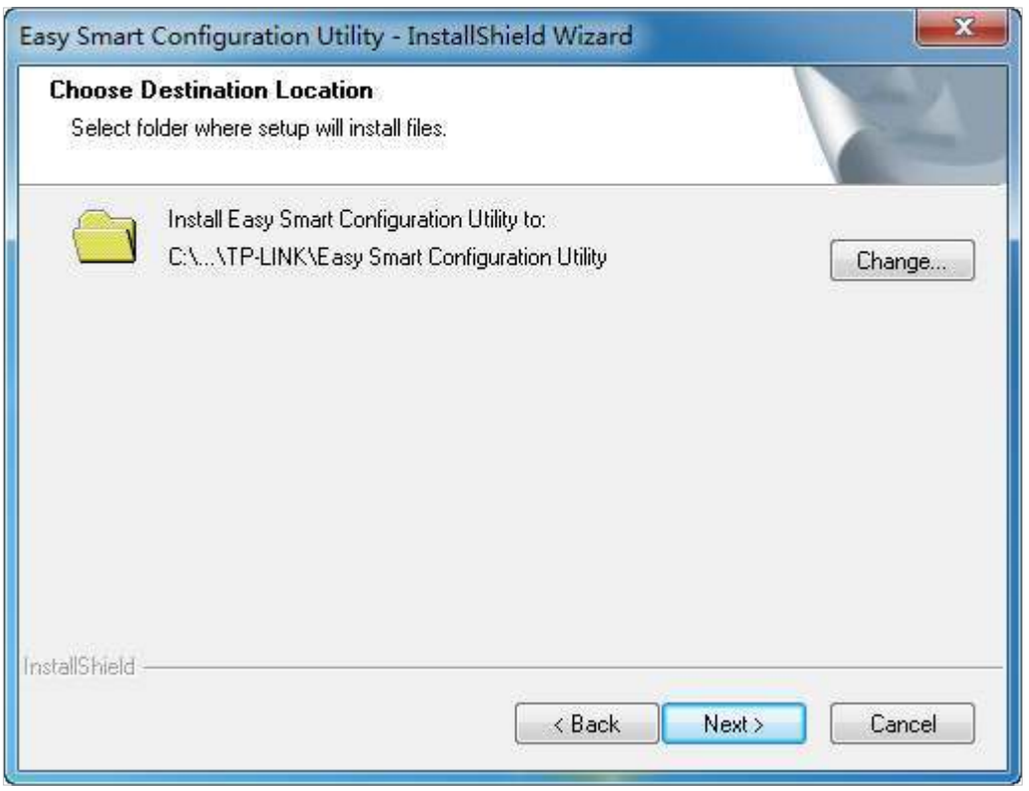
Figure 2-2 Launching the Installshield Wizard



4) Click **Next** to load the following page. Choose the destination location for the installation files. By default, the installation files are saved in the **Program Files** folder of

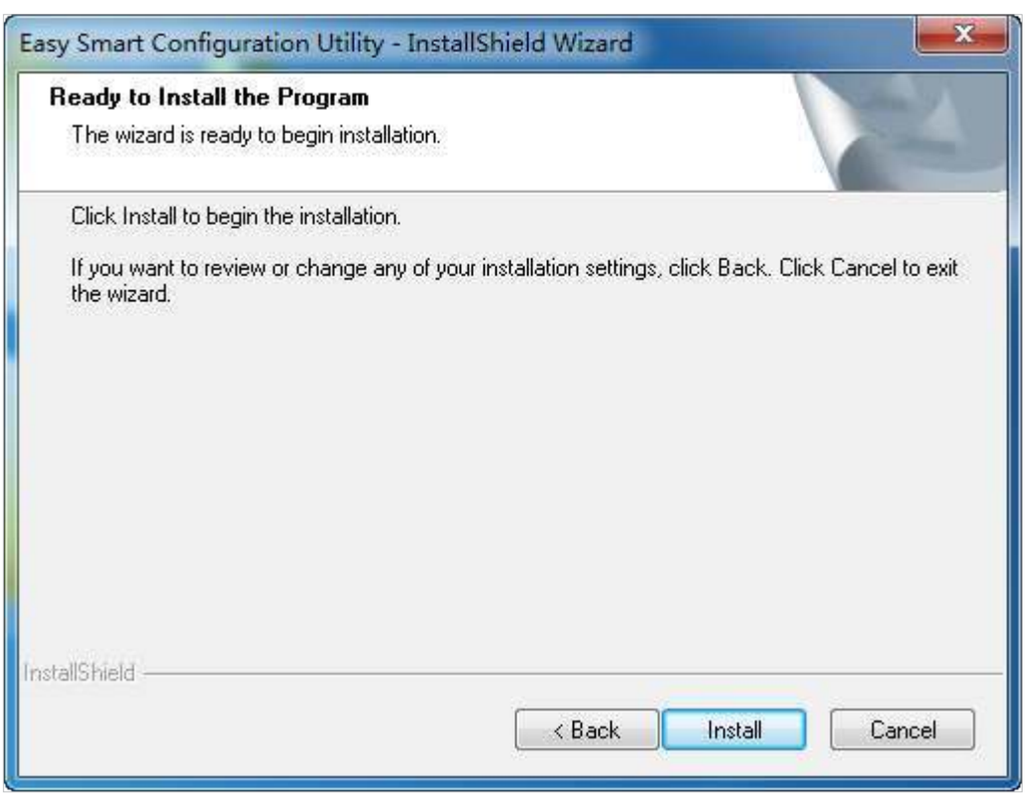
the system disk. You can lick **Change** to modify the destination location according to your needs.

Figure 2-3 Choosing the Deitination Location



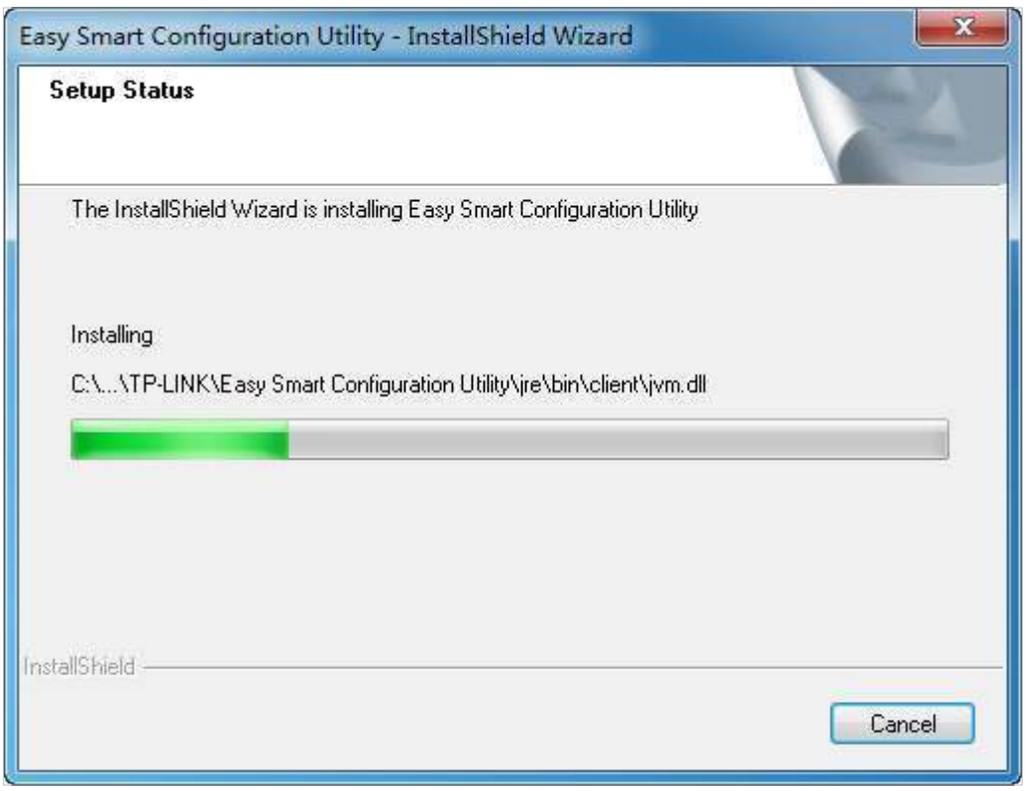
5) Click **Next** to load the following page. The wizard is ready to begin the installation.

Figure 2-4 Getting Ready to Install the Software



6) Click **Install** to load the following page. The wizard will install Easy Smart Configuration Utility.

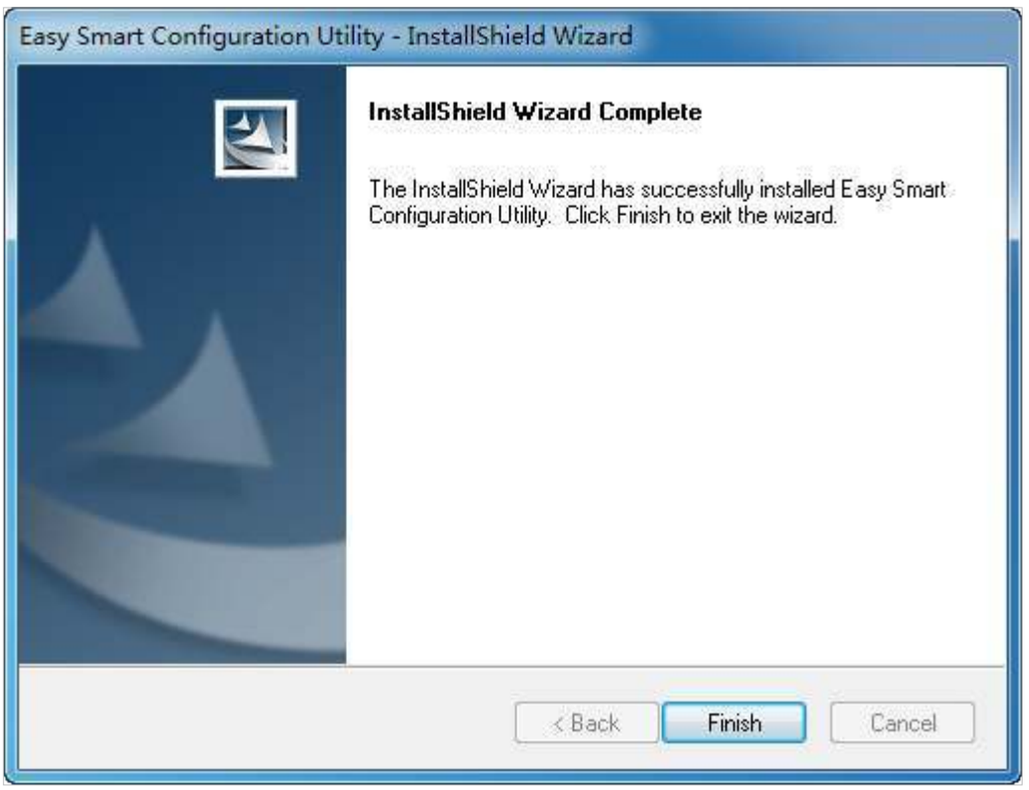
Figure 2-5 Installing the Utility



7) Wait a moment until the following page is displayed when the installation is completed. Click **Finish** to exit the wizard. By default, the installation process creates a TP-Link subdirectory under the **\Program Files** directory on your computer, copies the utility

program into the **\Program Files\TP-Link\Easy Smart Configuration Utility** directory, and places a utility icon on the computer desktop.

Figure 2-6 Finishing Installation



3 Discovering Switches

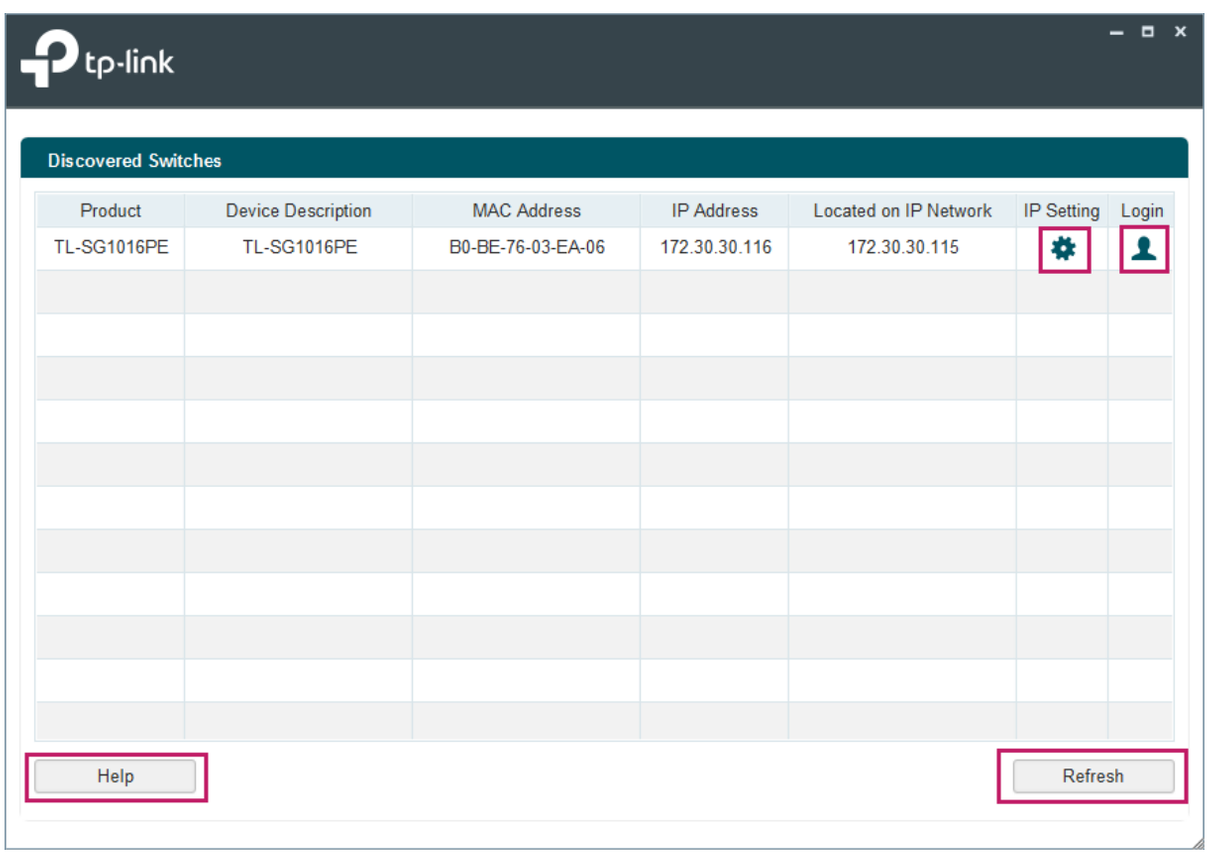
With the Switch Discovery fuction of the utility, you can:

- Discover the switches in the network.
- Configure IP setting for the switch.
- Log into the switch.

3.1 Discovering the Switches in the Network

Double click to launch the Easy Smart Configuration Utility, it searches the network for TP-Link Easy Smart switches automatically. The discovered switches are listed as below.

Figure 3-1 Discovering Switches



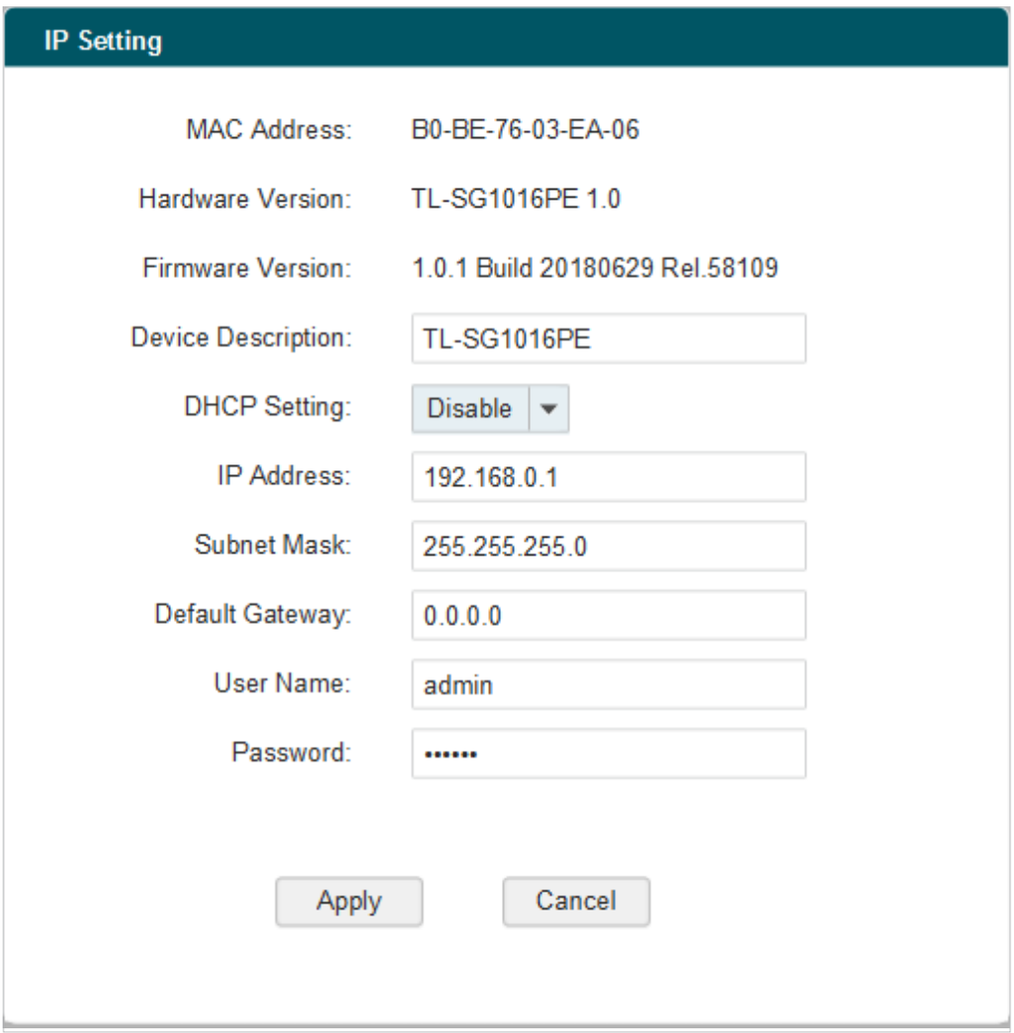
Note:

- The maximum number of the discovered switches is 30.
- You can click **Help** in the left bottom to access the TP-Link support website for more help about the switches, if you have access to the internet.
- Each time the network environment changes, it is recommended to click **Refresh** to restart the switch discovery process.

3.2 Configuring IP Setting for the Switch

Select the switch that you want to configure, and click to load the following page.

Figure 3-2 Configuring IP Address



Follow these steps to configure IP setting for the switch.

1) Verify the information of the switch. You can view the MAC address, hardware version, and firmware version of the switch.
2) Enter a proper device description for the switch according to your needs to distinguish different devices in your network.
3) Configure IP address, subnet mask, and default gateway for the switch. You can either configure the parameters manually or use DHCP.

   - Configuring the parameters manually

   Select DHCP setting as **Disable**. Specify the IP address, subnet mask and default gateway for the switch.

IP Address	Enter the IP address of the switch. You can use this IP address to access the switch. The default IP address of the switch is 192.168.0.1.

Subnet Mask	Enter the subnet mask of the switch. The default subnet mask of the switch is 255.255.255.0.
Default Gateway	Enter the default gateway of the switch.

- Using DHCP

Select DHCP setting as Enable.

4) Input the user name and password. The user name and password are both **admin** by default.
5) Click **Apply.**

Note:

If you enable DHCP setting, the switch will try to obtain IP address, subnet mask, and default gateway from the DHCP server in the network. If the switch cannot get IP settings from the DHCP server, it will use the default IP address of **192.168.0.1** and subnet mask of **255.255.255.0**.

3.3 Logging Into the Switch

Select the switch which you want to log into, and click  to load the following page.

Figure 3-3 Logging Into the Switch

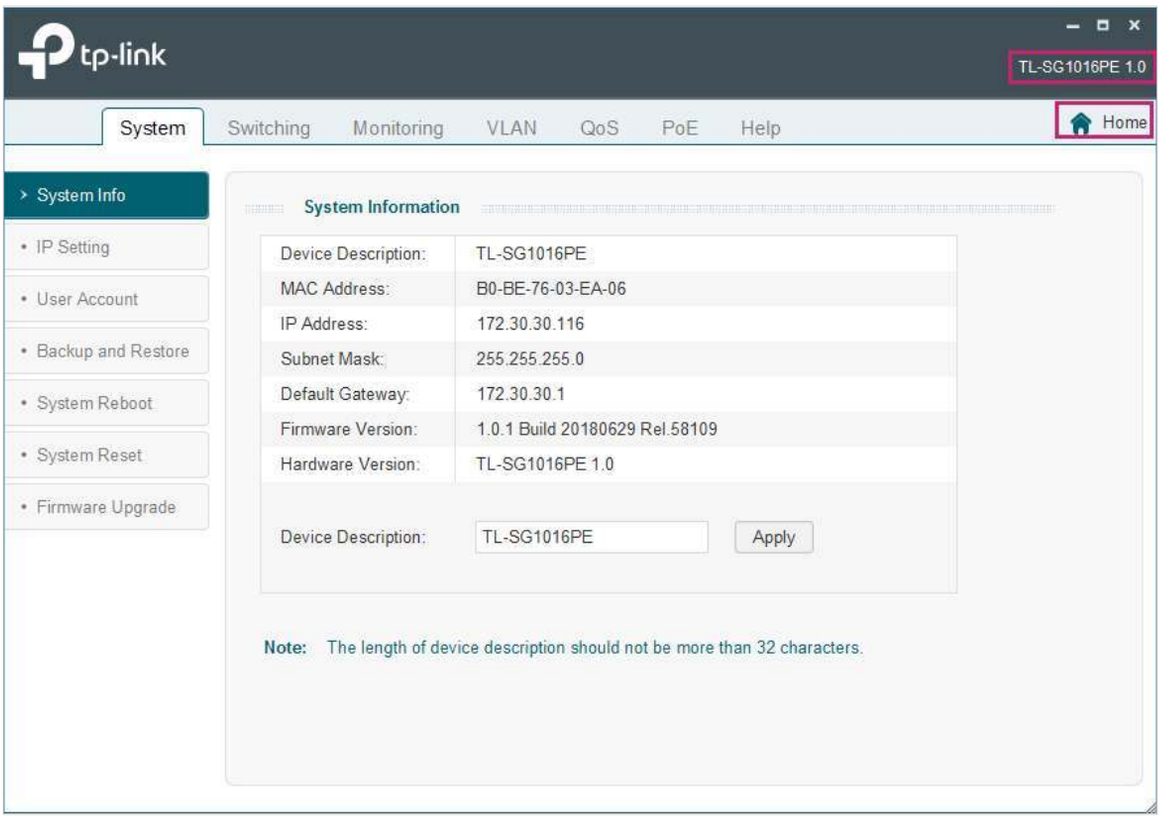


Follow these steps to log into the switch.

1) Input the user name and password. The user name and password are both **admin** by default.
2) (Optional) Check **Remember Me** to remember the user name and password.

3) Click **Login**. The following page will be displayed and you can configure the switch on this page. The model and hardware version of the switch that you are configuring are shown in the top-right corner.

Figure 3-4 Launching the Configuration Interface



Note:

- You can click to return to the switch discovery page.
- When you make changes and click **Apply**, the switch will save the configurations immediately.
- If you configure the switch after a long duration without operation (more than 600s), the utility will return to the Home page and refresh.

Part 2

Managing System

CHAPTERS

1. System
2. Configuring System Info
3. Configuring IP
4. Managing User Account
5. Backing Up and Restoring
6. Rebooting System
7. Resetting the System
8. Upgrading the Firmware

1 System

1.1 Overview

With the Managing System function, you can view the system information and configure the system parameters and features of the switch.

1.2 Supported Features

System Info

The System Info is mainly used to view the system information and configure the device description.

IP Setting

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

User Account Management

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

Backup and Restore

Backup and Restore is used to save the current configuration file in your computer, and upload a configuration file to restore your switch to the previous configuration.

System Reboot

System Reboot is used to reboot the switch.

System Reset

System Reset is used to reset the switch to the default setting.

Firmware Upgrade

To upgrade the firmware is to get more functions and better performance. Go to the website *https://www.tp-link.com* to download the updated firmware.

2 Configuring System Info

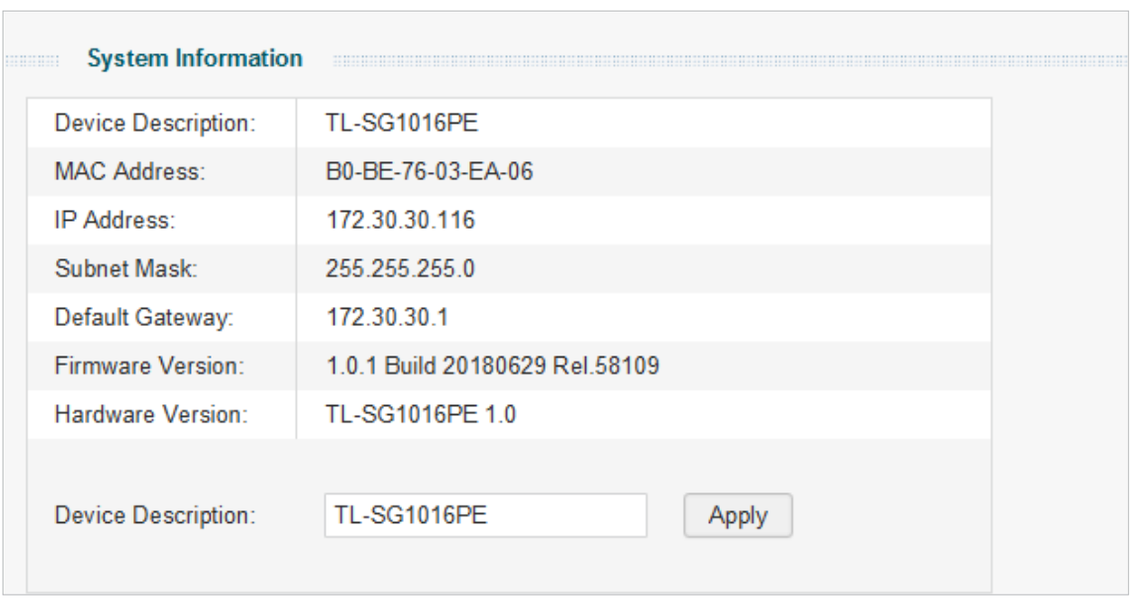
With the System Info function, you can:

- View the system information
- Specify the device description

2.1 Viewing the System Information

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

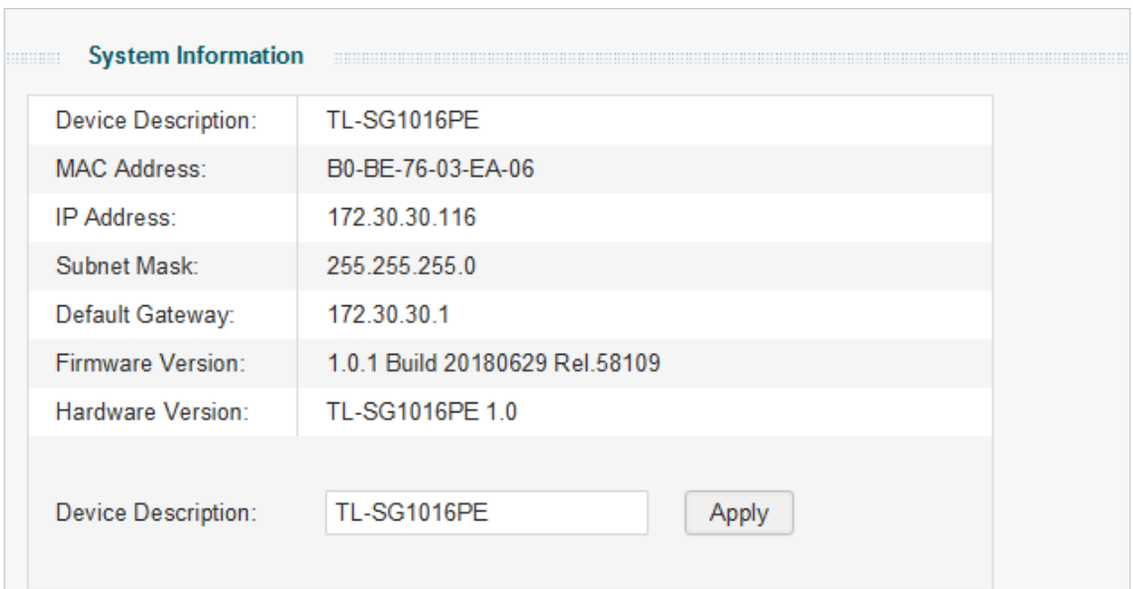
Figure 2-1 Viewing the System Summary



2.2 Specifying the Device Description

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

Figure 2-2 Specifying the Device Description



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** > **IP Setting** to load the following page.

Figure 3-1 Configuring System IP Address with DHCP Enabled



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

1) Select DHCP setting as **Enable** from the drop-down list.
2) Click **Apply**. Then the switch will try to obtain IP address, subnet mask, and default gateway from the DHCP server in the network. If the switch cannot get IP settings from the DHCP server, it will use the default IP address of **192.168.0.1** and subnet mask of **255.255.255.0**.

Configuring the System IP Address Manually

Choose the menu **System** > **IP Setting** 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 setting as **Disable** from the drop-down list.
2) Specify the IP address, subnet mask and default gateway.

IP Address	Enter the IP address of the switch. You can use this IP address to access the switch. The default IP address of the switch is **192.168.0.1**
Subnet Mask	Enter the subnet mask of the switch. The default subnet mask of the switch is **255.255.255.0**.
Default Gateway	Enter the default gateway of the switch.

3) Click **Apply**.

4 Managing User Account

With user account management, you can modify the username and password to refuse illegal users.

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

Figure 4-1 Managing the User Account



Follow these steps to configure the user account:

1) Specify the user name, enter the old password, specify a new password and confirm the new password.

User Name	Create a user name for login. The length of user name should be less than 16 characters which can contain only English letters, digits and underscores.
Old Password	Enter the old password of the switch. By default, the old password is **admin**.
New Password	Specify a new password for login. The length of password should be less than 16 characters which can contain only English letters, digits and underscores.
Confirm Password	Retype the new password.

2) Click **Apply**.

5 Backing Up and Restoring

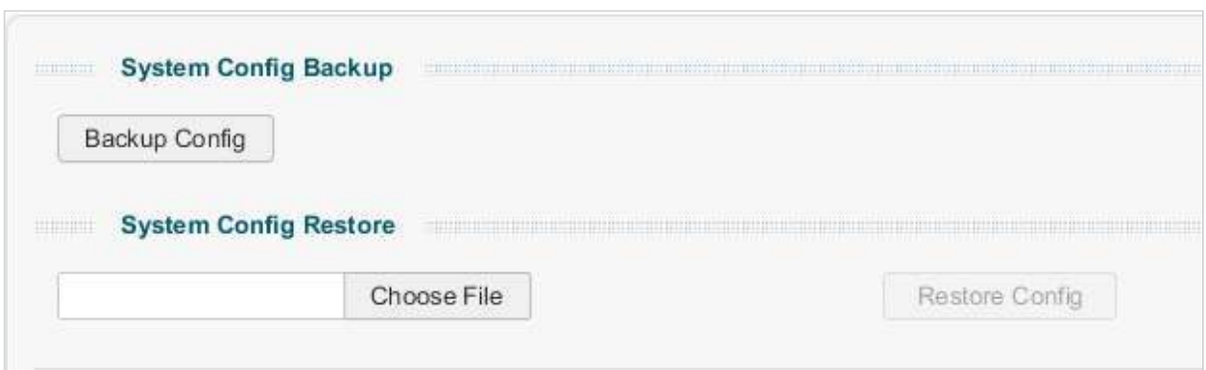
With the Backup and Restore function, you can:

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

5.1 Saving the Current Configuration

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

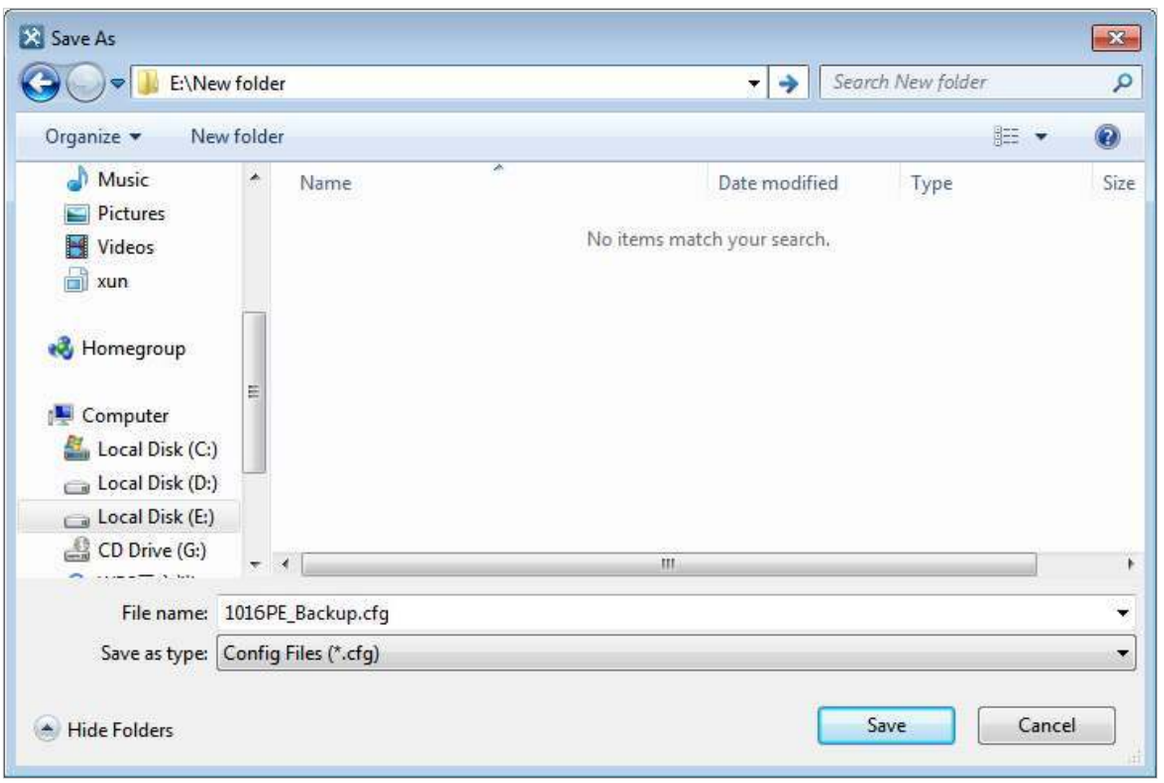
Figure 5-1 Backing Up System Config



Follow these steps to save the current configuration:

1) In the **System Config Backup** section, click **Backup Config** to load the following page. Specify the file path and file name for the configuration file to save.

Figure 5-2 Saving the Configuration File



2) Click **Save**.

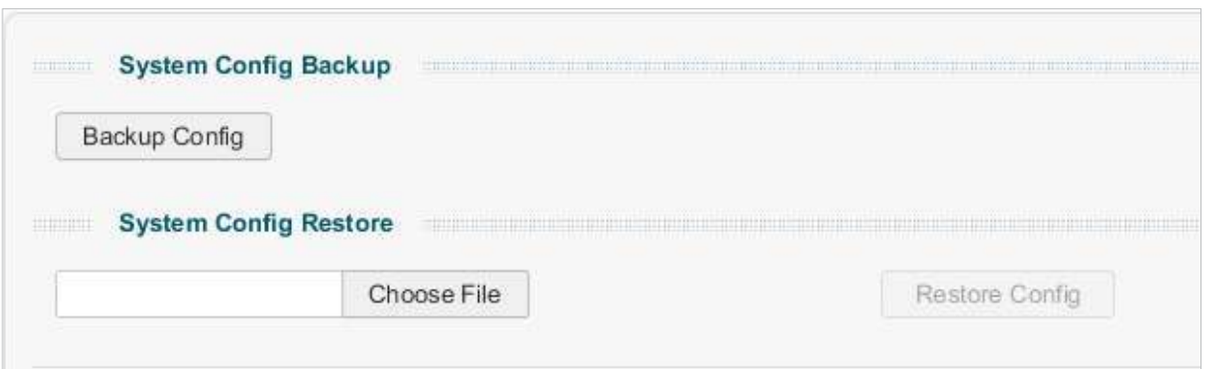
Note:

It will take a moment to save the configuration. Wait without any operation when saving the configuration file.

5.2 Restoring to the Previous Configuration

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

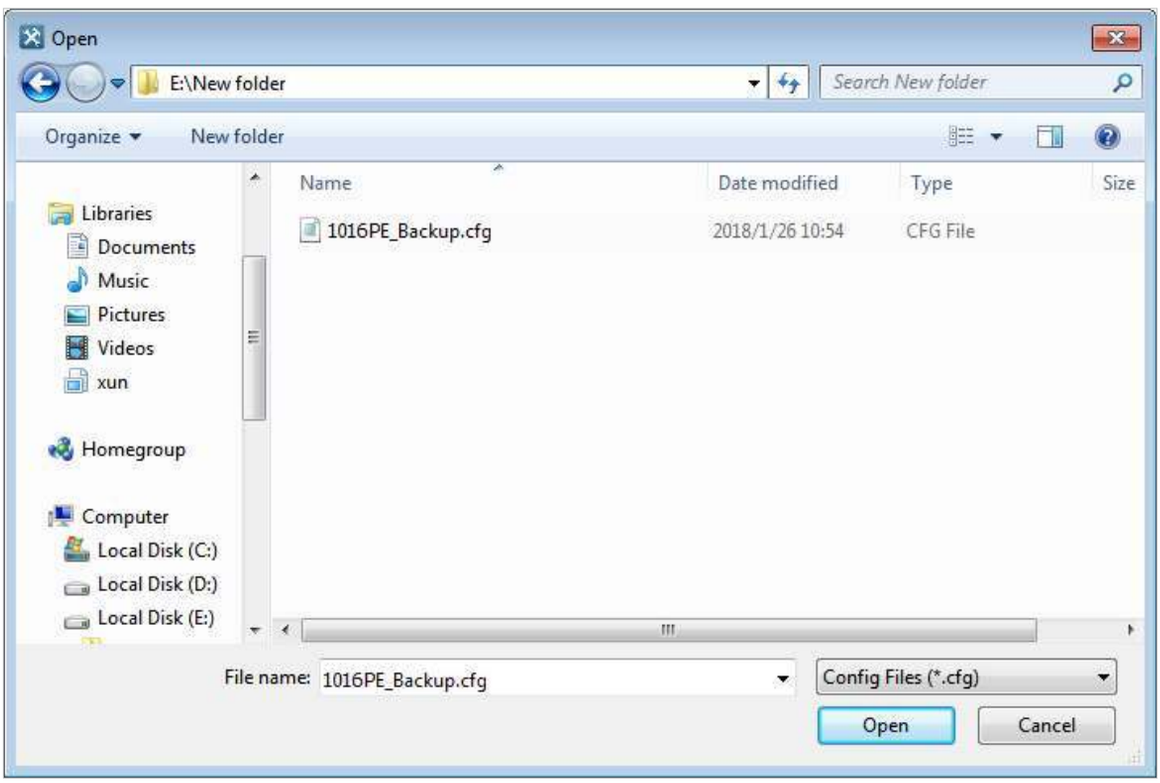
Figure 5-1 Restoring System Config



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

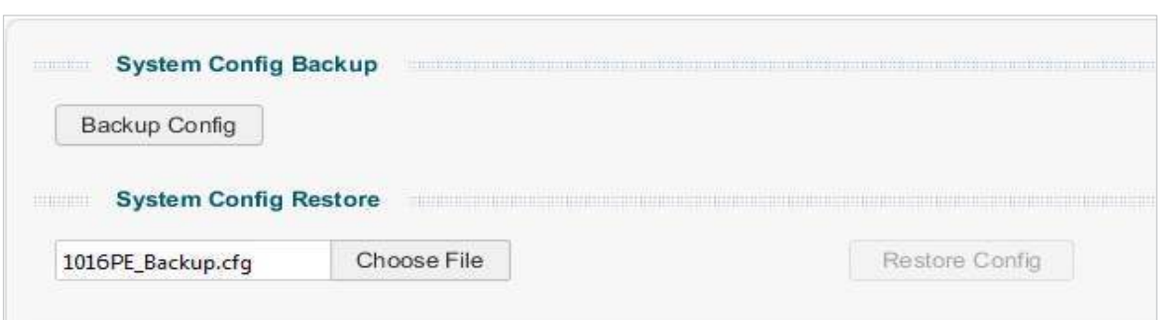
1) In the **System Config Restore** section, click **Choose File** to load the following page. Specify the configuration file path and select the configuration file. Click **Open**.

Figure 5-2 Choosing the Configuration File



2) The following page will be displayed.

Figure 5-3 Choosing the Configuration File



3) Click **Restore Config**, and the following page will be displayed. Click **Yes** to restore the switch to the previous configuration. It will take effect after the switch automatically reboots.

Figure 5-4 Being sure to restore config



Note:

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

6 Rebooting System

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

Figure 6-1 Rebooting the System



Note:

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

7 Resetting the System

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

Figure 7-1 Resetting the System



Follow these steps to reset the switch.

1) Click **Reset**, and the following page will be displayed.

Figure 7-2 Being Sure to Reset the System



2) Click **Yes** to reset the system.

Note:

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

8 Upgrading the Firmware

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

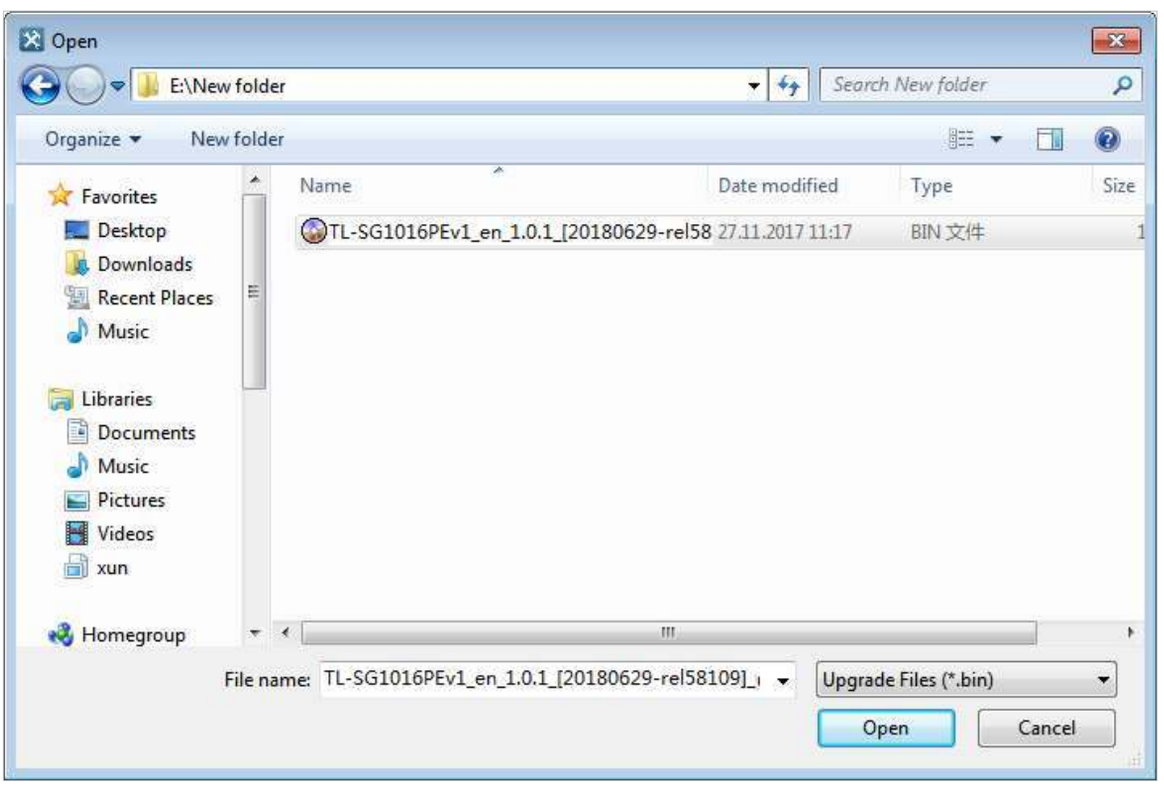
Figure 8-1 Upgrading the Firmware



Follow these steps to upgrade the firmware:

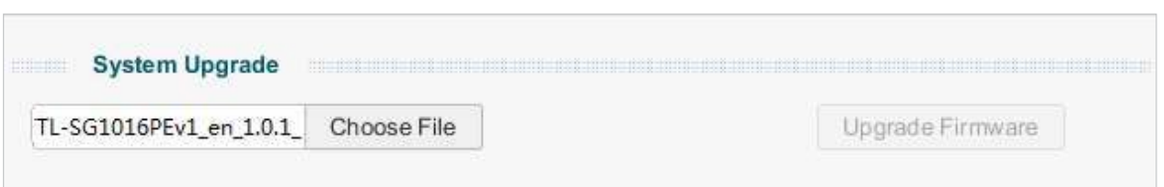
1) Click **Choose File** to load the following page. Enter the file path of the firmware in the address bar and select the firmware. Click **Open**.

Figure 8-2 Choosing the Firmware



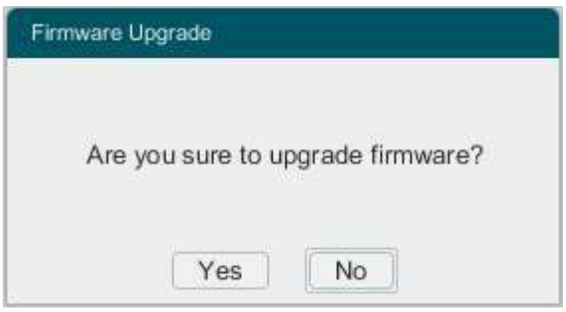
2) The following page will be displayed.

Figure 8-3 Choosing the Firmware



3) Click **Upgrade Firmware** to load the following page. Click **Yes** to upgrade the firmware.

Figure 8-4 Being Sure to Upgrade the Firmware



Note:

- It is recommended to backup the configuration before upgrading.
- If your PC and switch are not in the same subnet, you cannot upgrade firmware. Before you upgrade firmware, configure the IP address of your PC to ensure your PC and switch are in the same subnet.
- It will take a moment to upgrade the firmware. Wait without any operation.
- Select the proper software version matching with your hardware to upgrade.
- To avoid damage, do not power down the switch while upgrading the firmware.
- After upgrading, the switch will reboot automatically.

Part 3

Switching

CHAPTERS

1. Switching
2. Configuring Ports
3. Configuring IGMP Snooping
4. Configuring LAG
5. Configuration Example

1 Switching

1.1 Overview

With the Switching function, you can configure port setting, IGMP Snooping and LAG.

1.2 Supported Features

The switch supports the following features about switching:

Port Setting

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

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.

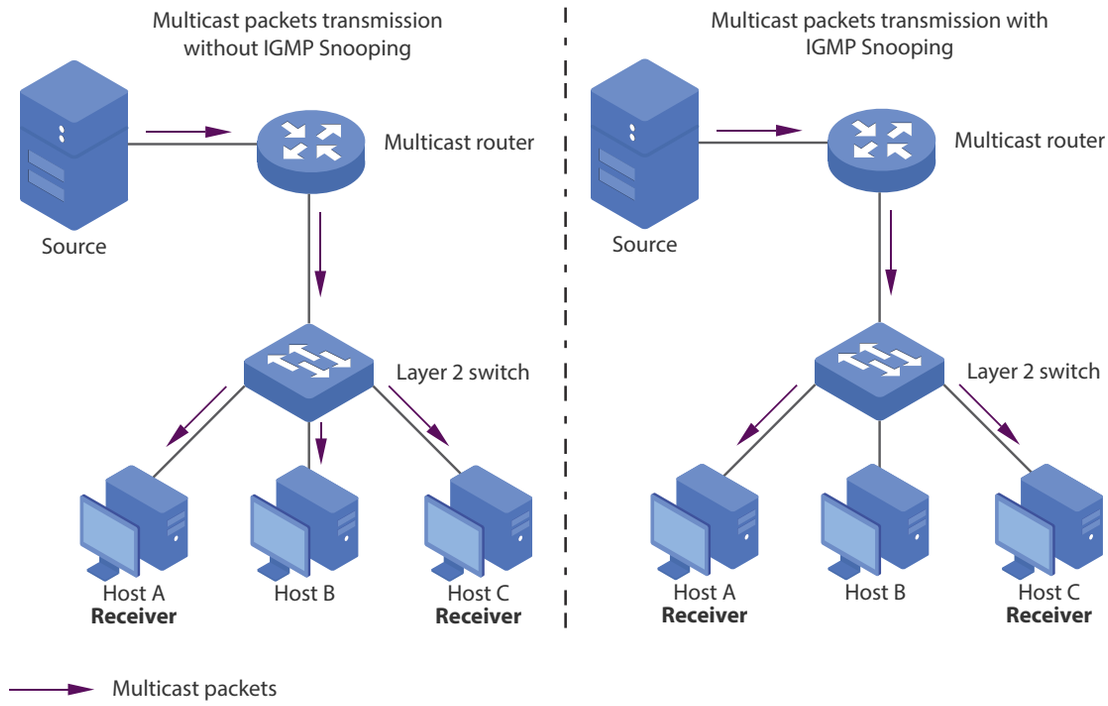
With broadcast, information will be sent to all users in the network no matter they need it or not, wasting network resources and impacting information security.

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



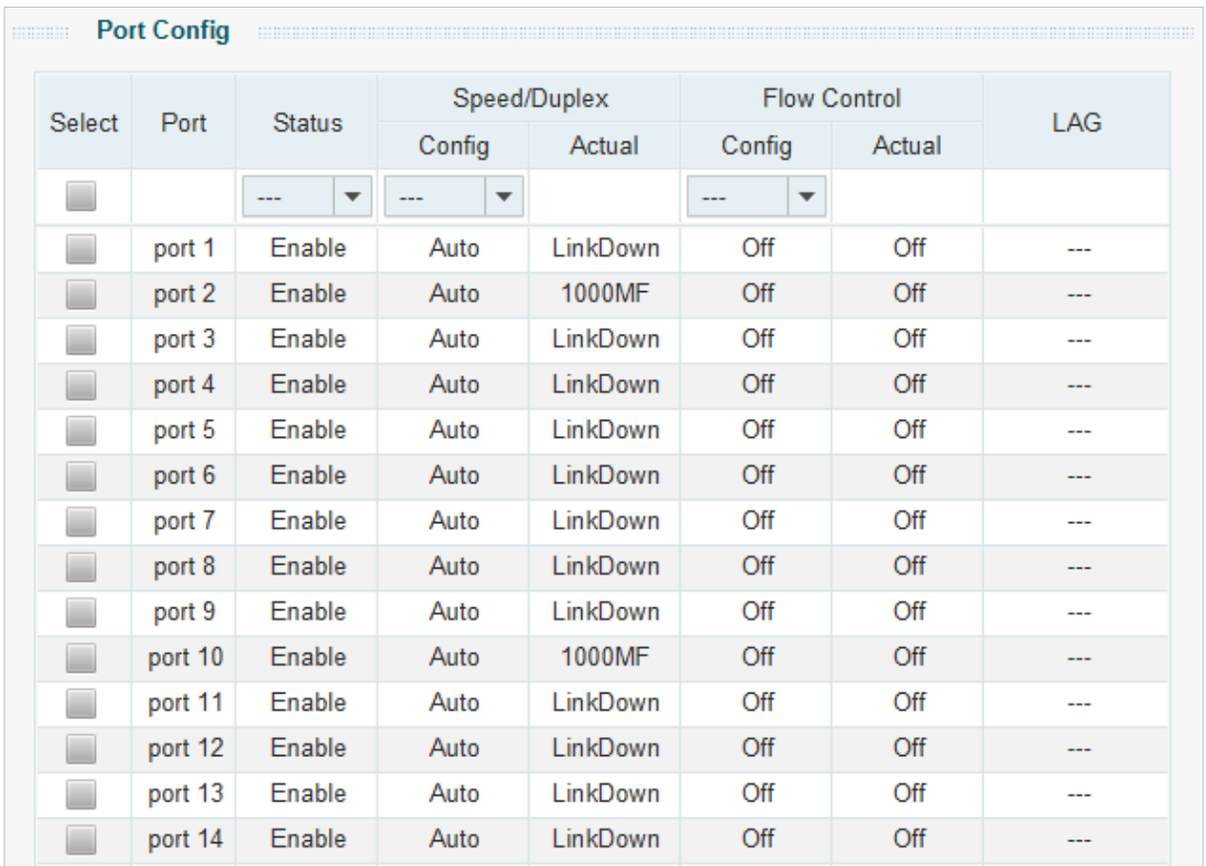
LAG

With LAG (Link Aggregation Group) 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 Setting** to load the following page.

Figure 2-1 Configuring Ports



Port Config

Select	Port	Status	Speed/Duplex		Flow Control		LAG
			Config	Actual	Config	Actual	
		---	---		---		
	port 1	Enable	Auto	LinkDown	Off	Off	---
	port 2	Enable	Auto	1000MF	Off	Off	---
	port 3	Enable	Auto	LinkDown	Off	Off	---
	port 4	Enable	Auto	LinkDown	Off	Off	---
	port 5	Enable	Auto	LinkDown	Off	Off	---
	port 6	Enable	Auto	LinkDown	Off	Off	---
	port 7	Enable	Auto	LinkDown	Off	Off	---
	port 8	Enable	Auto	LinkDown	Off	Off	---
	port 9	Enable	Auto	LinkDown	Off	Off	---
	port 10	Enable	Auto	1000MF	Off	Off	---
	port 11	Enable	Auto	LinkDown	Off	Off	---
	port 12	Enable	Auto	LinkDown	Off	Off	---
	port 13	Enable	Auto	LinkDown	Off	Off	---
	port 14	Enable	Auto	LinkDown	Off	Off	---

Follow these steps to configure the port parameters.

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

Status	Enable or disable the port. With this option enabled, the port forwards packets normally. Otherwise, the port does not forward packets. By default, it is enabled.
Speed/Duplex	**Config**: Select the appropriate speed and duplex mode for the port. When **Auto** is selected, the port automatically negotiates speed mode with the connected device. The default setting is **Auto**. It is recommended to select **Auto** if both ends of the link support auto-negotiation. **Actual**: Displays the actual working state of the port.
Flow Control	**Config**: Select **On** or **Off** to enable or disable the Flow Control feature. When Flow Control is enabled, when the switch get overloaded, it will send a PAUSE frame to notify the peer device to stop sending data for a specific period of time, thus avoiding the packet loss caused by congestion. By default, it is **Off**. **Actual**: Displays the current state of the Flow Control function of the port.

LAG	Displays the LAG which the port belongs to.

2) Click **Apply**.

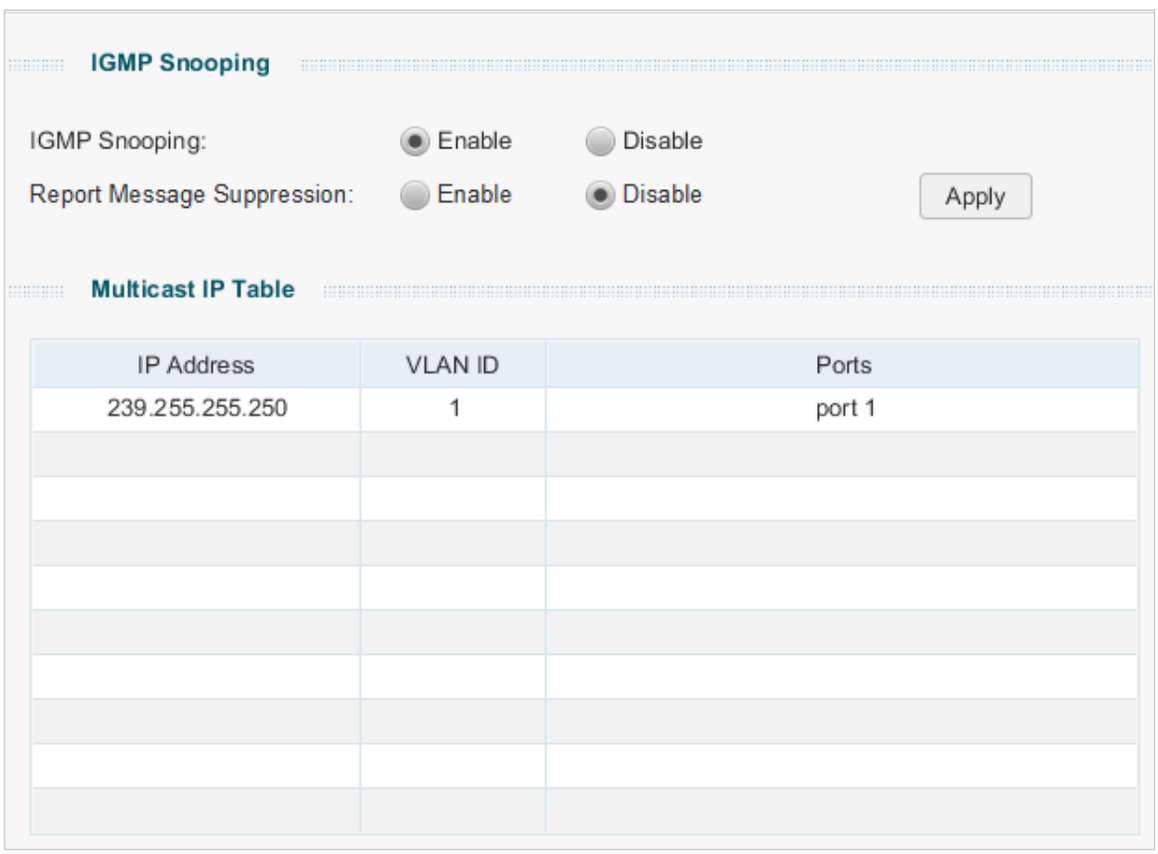
Note:

- 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 IGMP Snooping

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

Figure 3-1 Configuring IGMP Snooping



Follow these steps to configure IGMP Snooping.

1) In the **IGMP Snooping** section, enable IGMP Snooping. Enable or disable Report Message Suppression according to your needs. Click **Apply**.

IGMP Snooping	Enable or disable IGMP Snooping globally.
Report Message Suppression	Enable or disable Report Message Suppression globally. When enabled, the switch will only forward the first IGMP report message for each multicast group to the IGMP querier and suppress subsequent IGMP report messages for the same multicast group during one query interval. This feature prevents duplicate report messages from being sent to the IGMP querier.

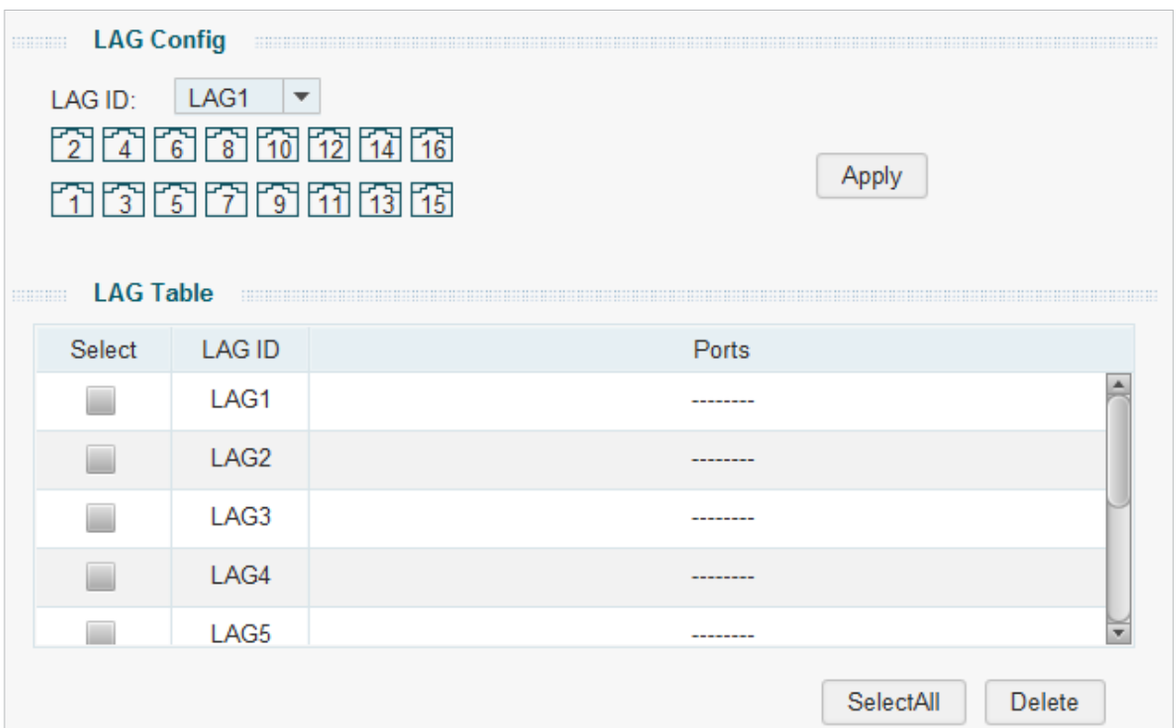
2) In the **Multicast IP Table** section, you can view the current IGMP group information.

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.
Ports	Displays the forwarding port list of the multicast group.

4 Configuring LAG

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

Figure 4-1 Configuring LAG



Follow these steps to configure LAG:

1) In the **LAG Config** section, select an LAG ID and click the ports to add to the LAG. Click **Apply**.
2) In the **LAG Table** section, you can verify the LAG configuration result. You can select the LAG and click **Delete** to delete ports from the LAG group.

LAG ID	Displays the ID of the LAG group.
Ports	Displays the LAG member ports.

Note:

- 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.
- The LAG member ports cannot be set as the mirroring port or mirrored port.
- It is recommended to configure the LAG function before configuring the other functions for the member ports.

5 Configuration Example

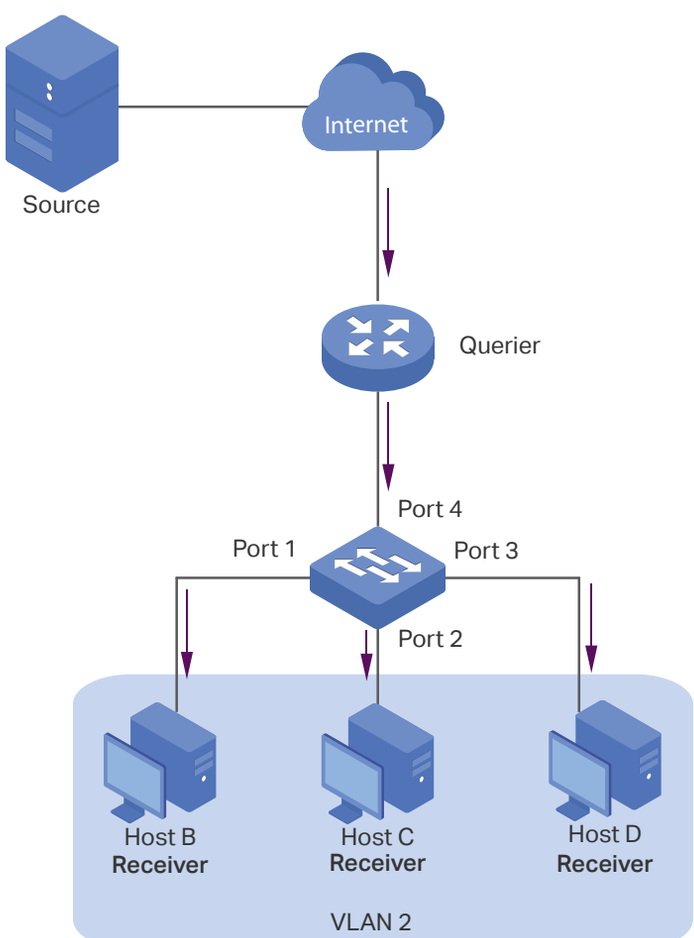
5.1 Example for Configuring IGMP Snooping

5.1.1 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 5-1 Network Topology for Basic IGMP Snooping



5.1.2 Configuration Scheme

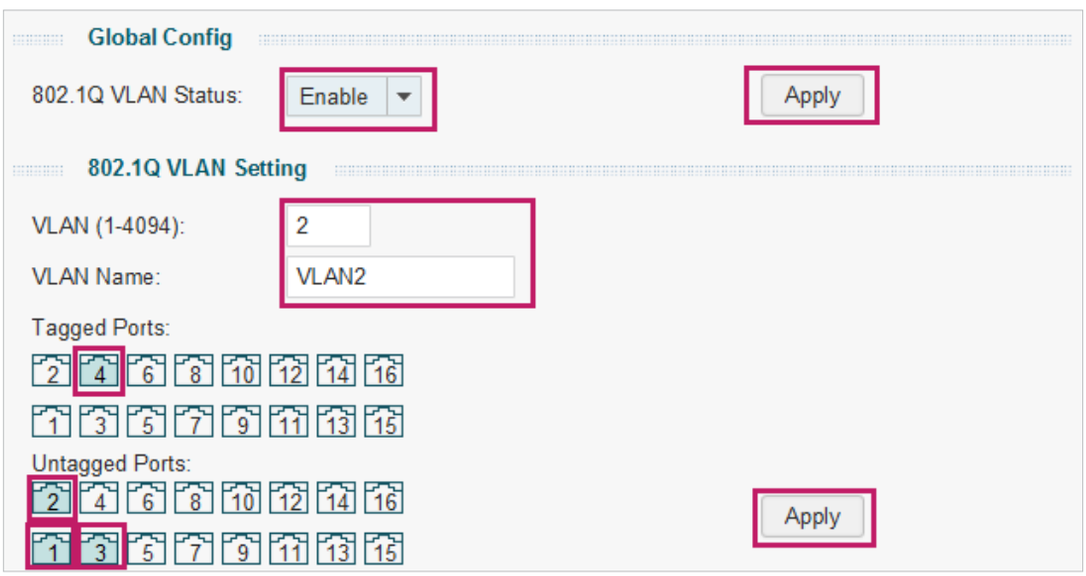
- Add the three member ports and the router port to a VLAN.
- Enable IGMP Snooping.

Demonstrated with TL-SG1016PE, the following section provides configuration steps.

5.1.3 Configuration Steps

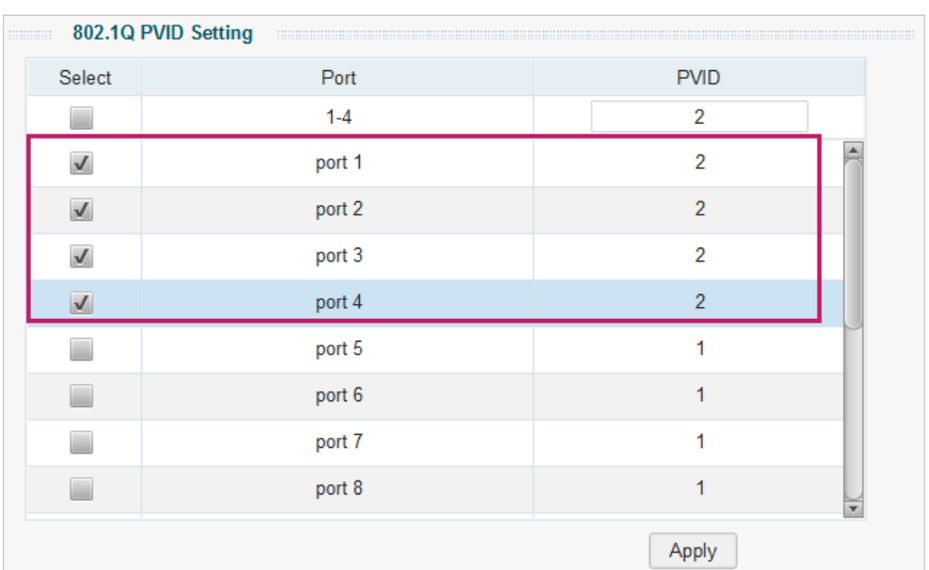
1) Choose the menu **VLAN > 802.1Q VLAN** to load the following page. Select the 802.1Q VLAN status as **Enable**. Click **Apply**. Specify the VLAN ID as **2**. Specify the VLAN name as **VLAN2**. Select port 1, port 2 and port 3 as untagged ports. Select port 4 as a tagged port. Click **Apply**.

Figure 5-2 Configuring 802.1Q VLAN



2) Choose the menu **VLAN > 802.1Q VLAN PVID Setting** 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 5-3 Configuring 802.1Q PVID



3) Choose the menu **Switching > IGMP Snooping** to load the following page. Enable IGMP Snooping, and click **Apply**.

Figure 5-4 Configuring IGMP Snooping

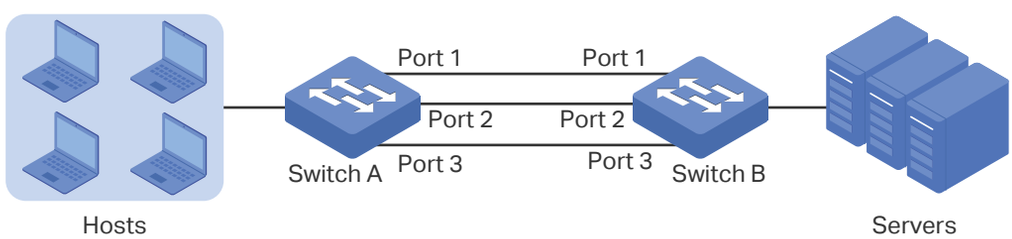


5.2 Example for Configuring LAG

5.2.1 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 5-1 Network Topology

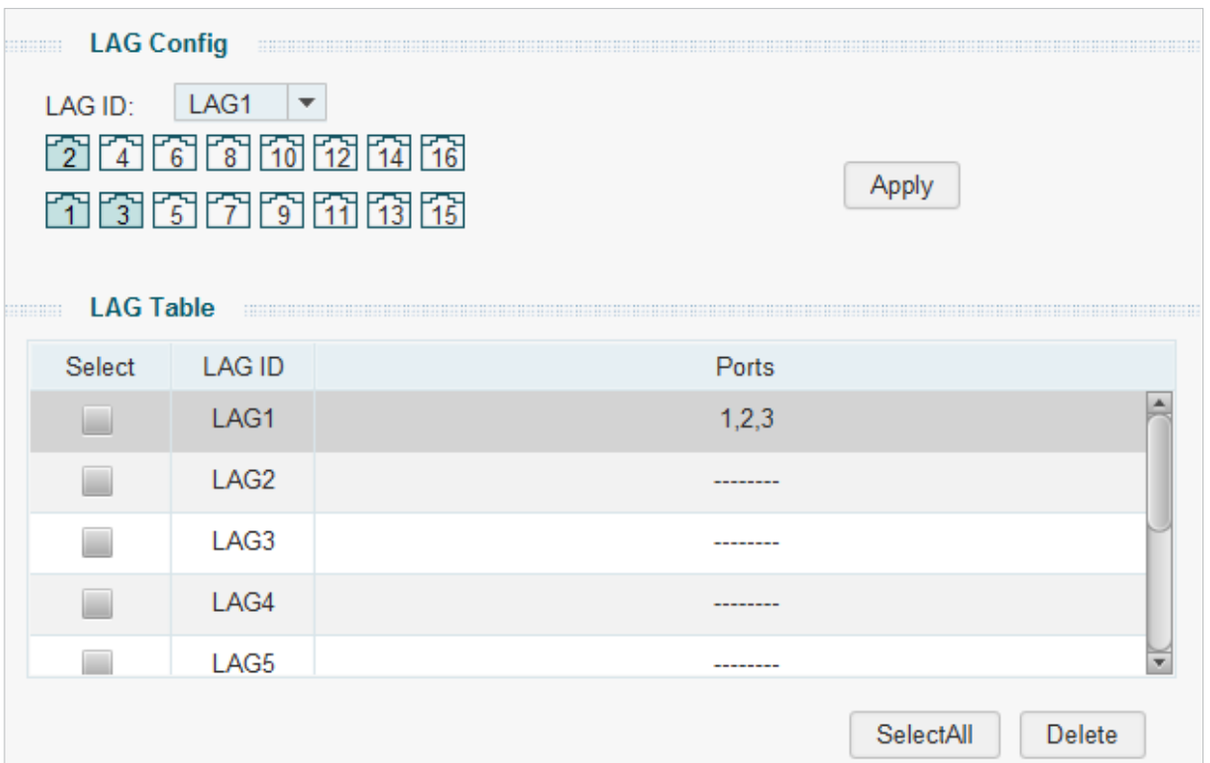


Demonstrated with TL-SG1016PE, the following section provides configuration steps. The configuration steps are similar for both switches, here we take Switch A for example.

5.2.2 Configuration Steps

Choose the menu **Switching > LAG** to load the following page. In the **LAG Config** section, select Port 1, Port 2 and Port 3 to add to the LAG 1. Click **Apply**.

Figure 5-1 Configuring LAG



Part 4

Monitoring

CHAPTERS

1. Monitoring
2. Viewing Port Statistics
3. Configuring Port Mirror
4. Testing the Cable
5. Configuring Loop Prevention

1 Monitoring

1.1 Overview

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

1.2 Supported Features

Port Statistics

Port Statistics is used to display the information of each port, which facilitates you to monitor the traffic and locate faults promptly.

Port Mirror

Port Mirror is used to monitor network traffic by forwarding copies of incoming and outgoing packets from one or multiple ports (mirrored ports) to a specified port (mirroring port). Generally, the mirroring port is connected to a data diagnosis device, which is used to analyze the mirrored packets for monitoring and troubleshooting the network.

Cable Test

The switch provides cable test to diagnose the connection status of the cable connected to the switch and the distance to the problem location, which facilitates you to locate and diagnose the trouble spot of the network.

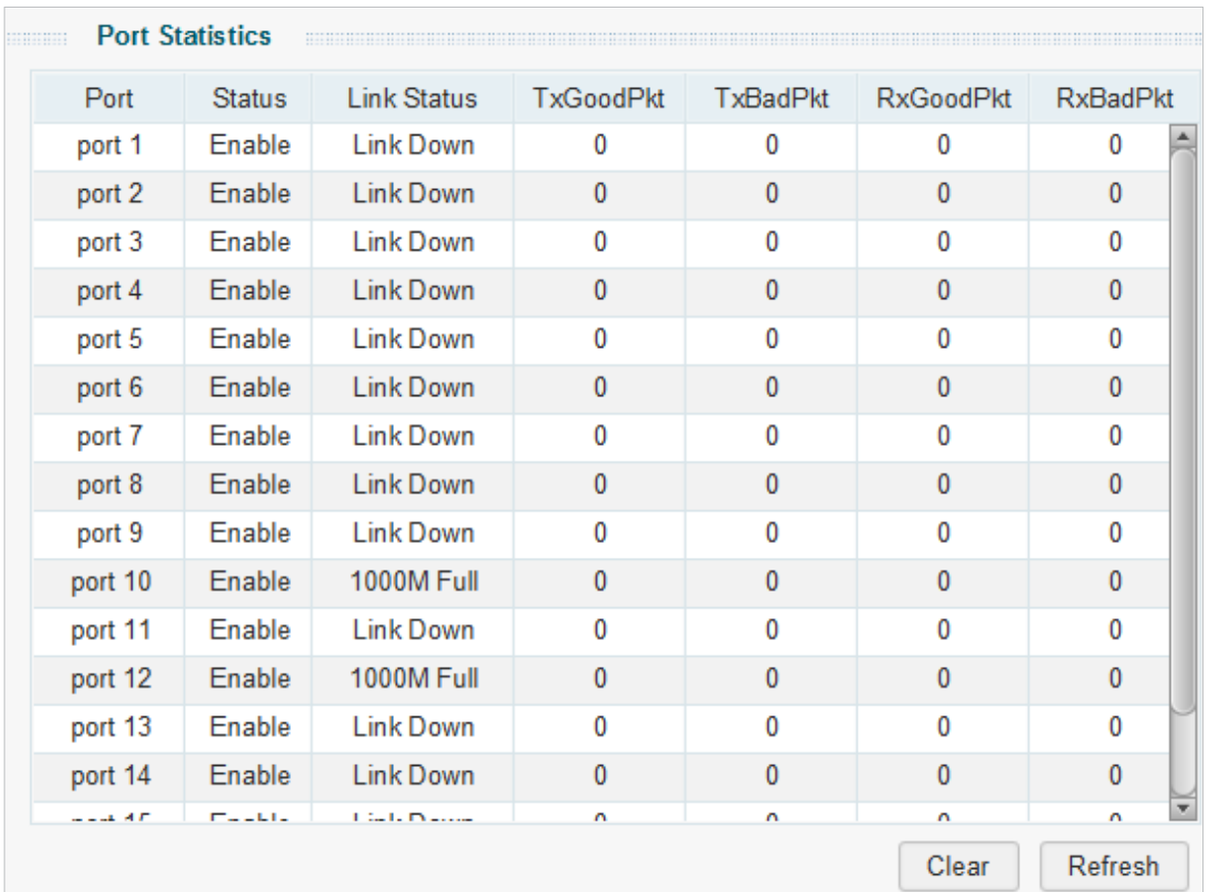
Loop Prevention

With loop prevention feature enabled, the switch can detect loops using loop detection packets. When a loop is detected, the switch will block the corresponding port automatically.

2 Viewing Port Statistics

Choose the menu **Monitoring > Port Statistics** to load the following page.

Figure 2-1 Viewing Port Statistics



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

Port	Displays the port number of the switch.
Status	Display whether the port is enabled or disabled.
Link Status	Displays the link state of the port.
TxGoodPkt	Displays the number of packets transmitted on the port. Error packets are not counted in.
TxBadPkt	Displays the number of error packets transmitted on the port.
RxGoodPkt	Displays the number of packets received on the port. Error packets are not counted in.
RxbadPkt	Displays the number of error packets received on the port.

Note:

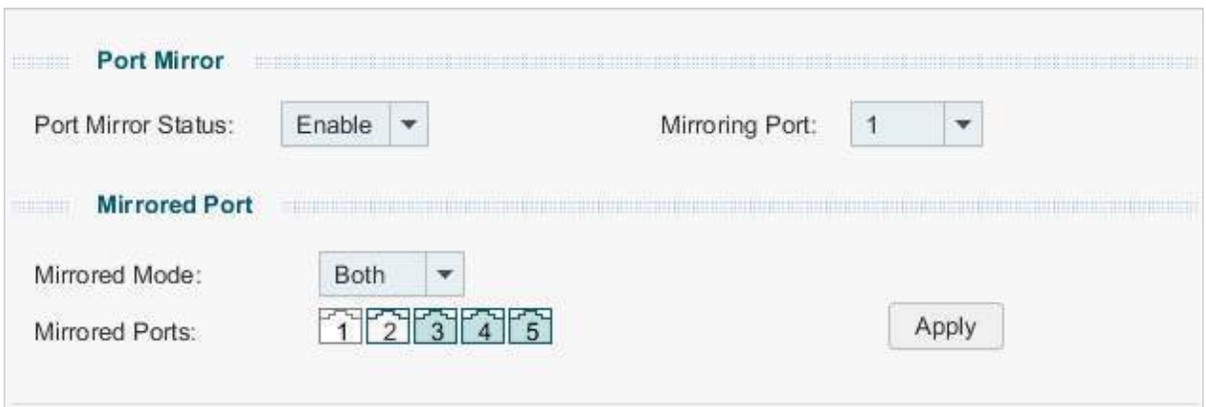
- The frames with more than 1518 bytes, less than 64 bytes or with bad Frame Check Sequence (FCS) are recorded as BadPkts.
- Because of the supporting feature of jumbo frame, the frames with more than 1518 bytes and less than 10000 bytes will be recorded as GoodPkts and BadPkts at the same time, and can be forwarded normally.

3 Configuring Port Mirror

- For TL-SG108PE

Choose the menu **Monitoring > Port Mirror** to load the following page.

Figure 3-1 Configuring Port Mirror



Follow these steps to configure port mirror:

1) In the **Port Mirror** section, Select the port mirror status as **Enable**. Specify the mirroring port. In the **Mirrored Port** section, select a mirrored mode according to your needs, and select one or more mirrored ports.

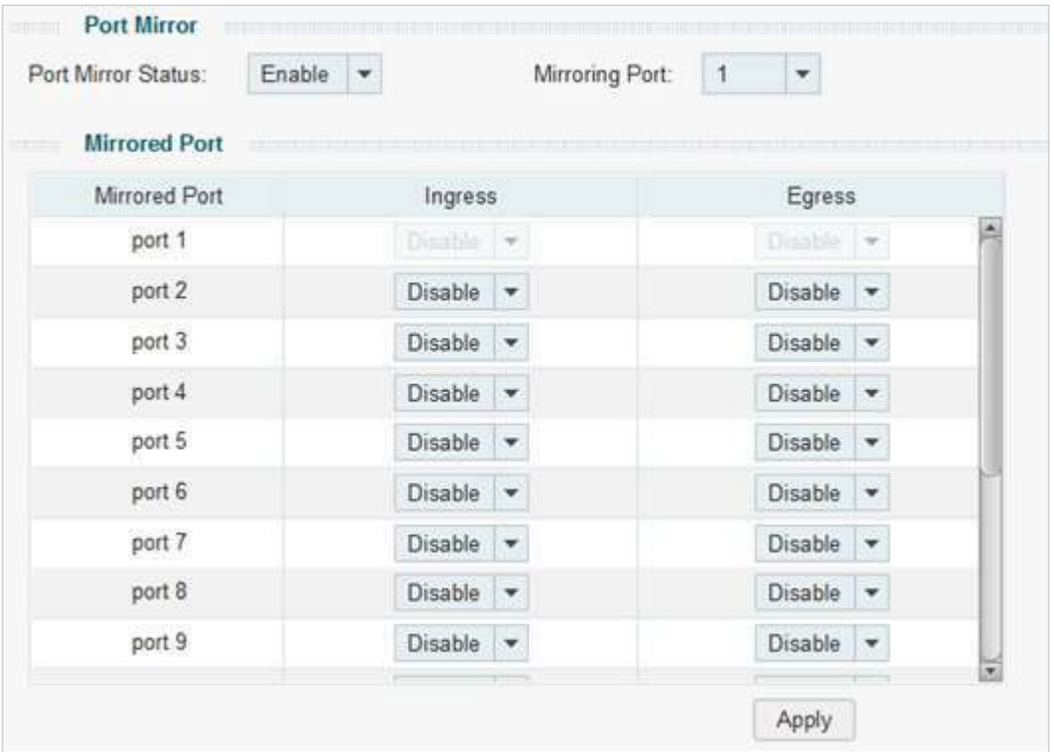
Port Mirror Status	Enable or disable the port mirror feature globally.
Mirroring Port/ Mirrored Ports	Traffic passing through the mirrored ports is mirrored to the mirroring port.
Mirrored Mode	Select the mirrored mode according to your needs. **Ingress**: With this option enabled, only the packets received by the mirrored ports are copied to the mirroring port. **Egress**: With this option enabled, only the packets sent by the mirrored ports are copied to the mirroring port. **Both**: With this option enabled, the packets both sent and received by the mirrored ports are copied to the mirroring port.

2) Click **Apply**.

- For TL-SG1016DE/ TL-SG1024DE/ TL-SG1016PE/TL-SG1218MPE

Choose the menu **Monitoring > Port Mirror** to load the following page.

Figure 3-2 Configuring Port Mirror



Follow these steps to configure port mirror:

1) In the **Port Mirror** section, specify the port mirror status as **Enable**. Specify the mirroring port. In the **Mirrored Port** section, configure whether the ingress and egress packets of each port are mirrored or not.

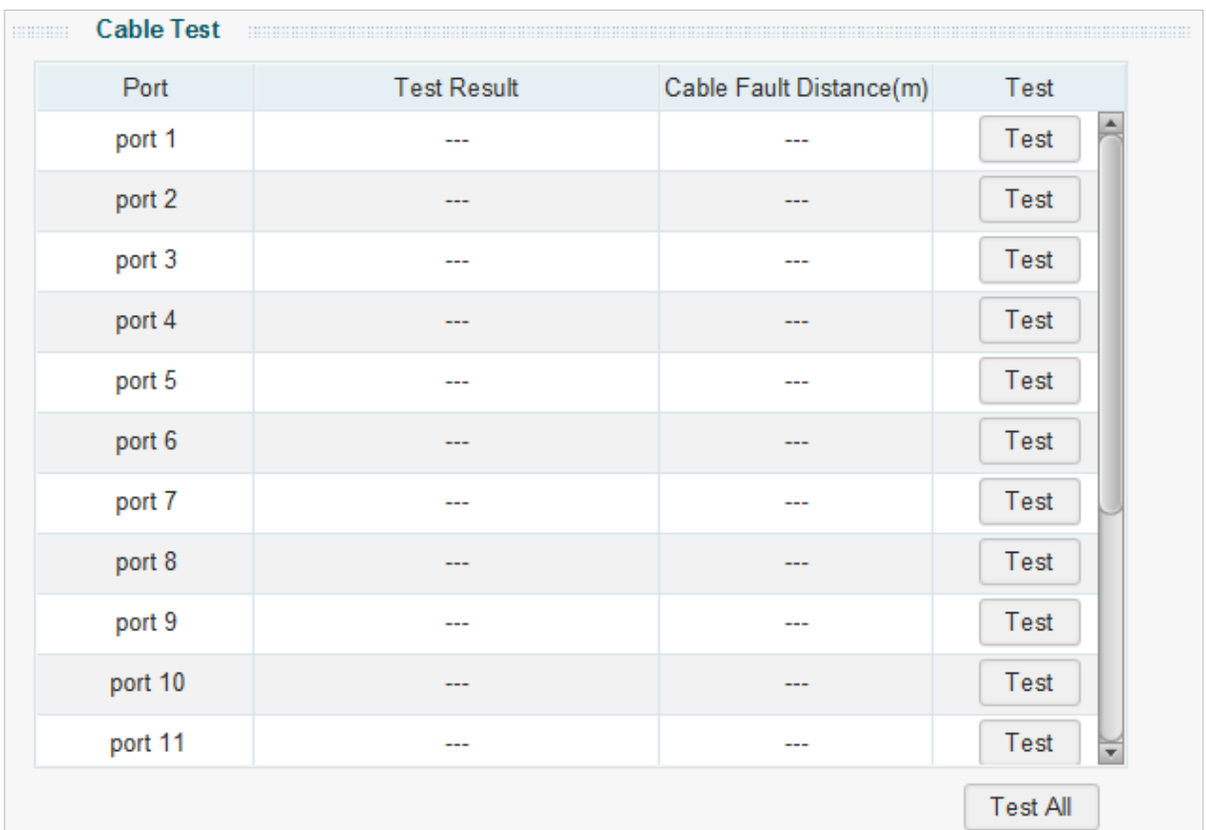
Port Mirror Status	Enable or disable the port mirror feature globally.
Mirroring Port/ Mirrored Ports	Traffic passing through the mirrored ports is mirrored to the mirroring port.
Ingress	For each port, with this option enabled, the packets received by the port are copied to the mirroring port. With this option disabled, the packets received by the port are not copied to the mirroring port.
Egress	For each port, with this option enabled, the packets sent by the port are copied to the mirroring port. With this option disabled, the packets sent by the port are not copied to the mirroring port.

2) Click **Apply**.

4 Testing the Cable

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

Figure 4-1 Testing the Cable



Follow these steps to test the cable:

1) Select your desired port for test, and click **Test**. You can also click **Test All** to test all the cables.
2) Check the test results in the table.

Port	Displays the port number.
Test Result	Displays the cable status. Test results include normal, close (or short), open and crosstalk. **Normal** : The cable is connected normally. **Close (or short)**: A short circuit is being caused by abnormal contact of wires in the cable. **Open**: No device is connected to the other end or the connection is broken. **Crosstalk**: Impedance mismatch due to the poor quality of the cable.
Cable Fault Distance (m)	If the connection status is short, close (or short) or crosstalk, here displays the length from the port to the trouble spot.

5 Configuring Loop Prevention

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

Figure 5-1 Configuring Loop Prevention



Follow these steps to configure loop prevention:

1) Select the loop prevention status as **Enable** or **Disable** from the drop-down list.

Loop Prevention Status	Enable or disable the loop prevention feature globally.

2) Click **Apply**.

Part 5

Configuring VLAN

CHAPTERS

1. Overview
2. Configuring MTU VLAN
3. Configuring Port Based VLAN
4. Configuring 802.1Q VLAN
5. Configuration Example for 802.1Q VLAN

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.
- For easier 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.

Traditional Ethernet data frame (Untagged Frame)

Distination Address	Source Address	Length/ Type	Data	FCS

VLAN data frame (Tagged Frame)

Distination 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.

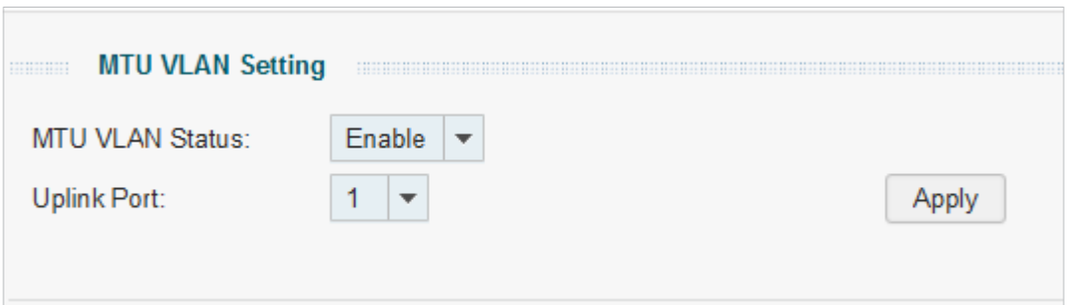
Note:

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.

2 Configuring MTU VLAN

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

Figure 2-1 Configuring MTU VLAN



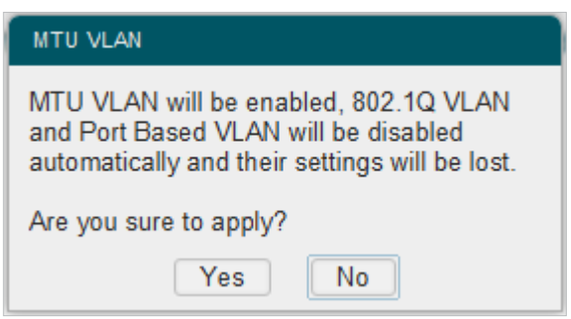
Follow these steps to configure MTU VLAN:

1) Select the MTU VLAN status as **Enable** from the drop-down list. Select the desired uplink port from the drop-down list. Click **Apply**.

MTU VLAN Status	Enable or disable the MTU VLAN mode.
Uplink Port	Select the desired uplink port from the drop-down list. The uplink port builds up several VLANs with each of the other ports.

2) The following page will be displayed. Click **Yes**.

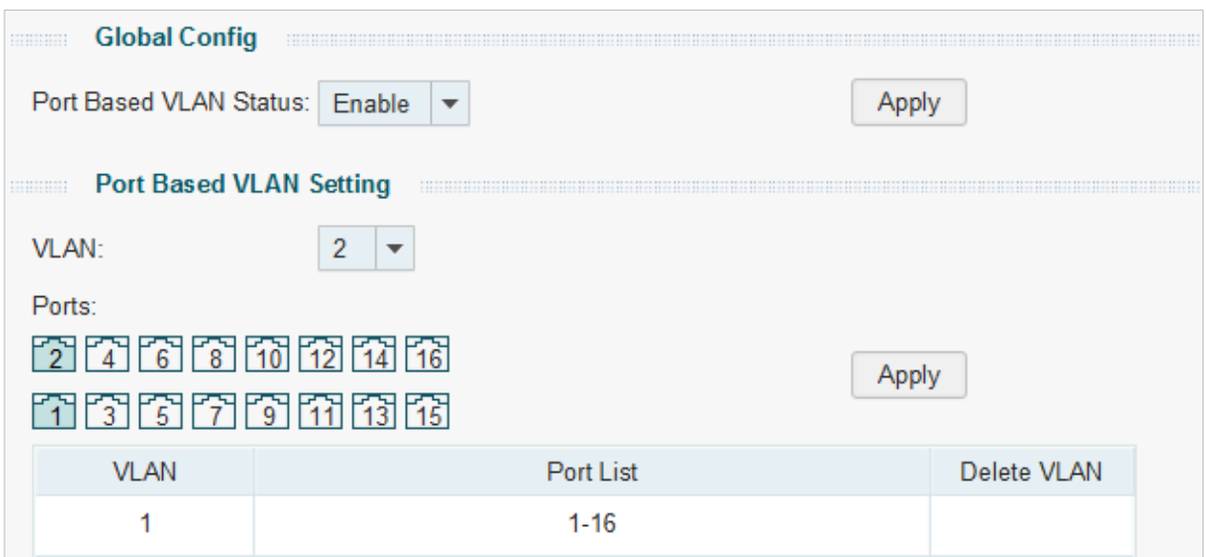
Figure 2-2 Being Sure to Enable MTU VLAN



3 Configuring Port Based VLAN

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

Figure 3-1 Configuring Port Based VLAN



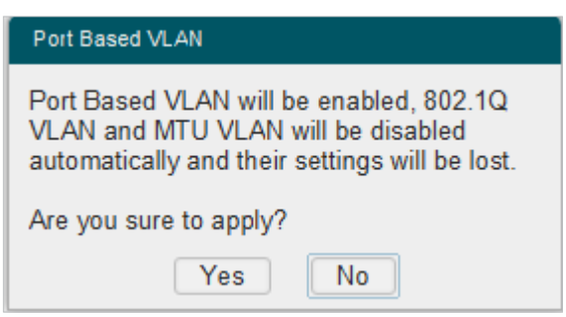
Follow these steps to configure port based VLAN:

1) In the **Global Config** section, select the port based VLAN status as **Enable** from the drop-down list. Click **Apply**.

Port Based VLAN Status	Enable or disable the port based VLAN mode.

2) The following page will be displayed. Click **Yes**.

Figure 3-2 Being Sure to Enable Port Based VLAN

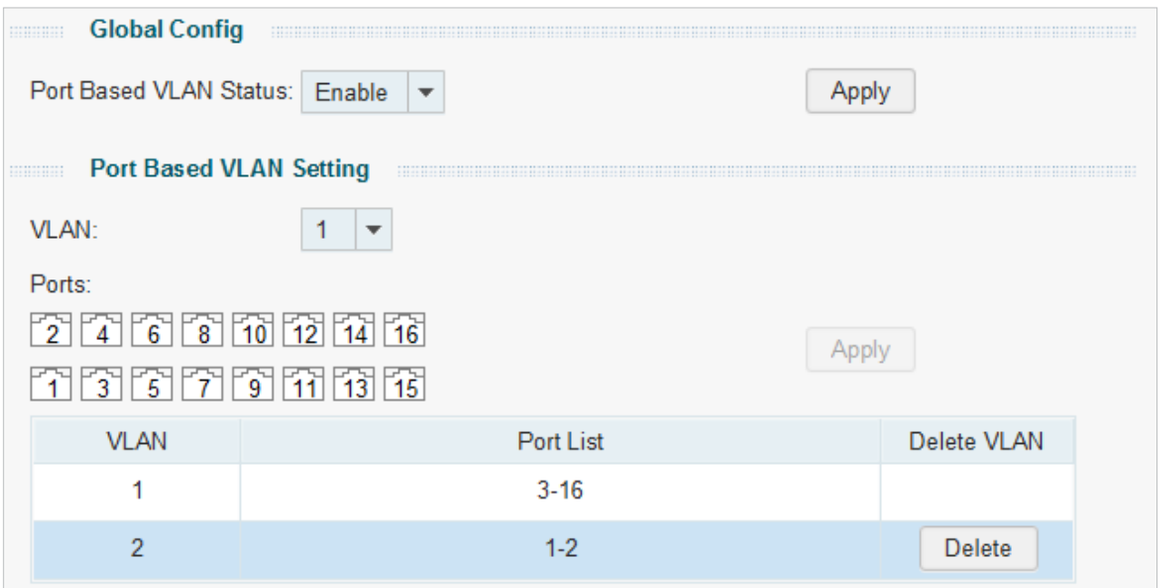


3) In the **Port Based VLAN Setting** section, Select the ID for the VLAN and ports to add to the VLAN. Click **Apply**.

VLAN	Select the ID for the VLAN which you want to add ports to.
Ports	Select the ports to add to the VLAN.

4) You can verify the configuration result of port based VLAN in the table. You can delete a VLAN as you wish by selecting the VLAN and clicking **Delete**.

Figure 3-3 Verifying the Configuration Result



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

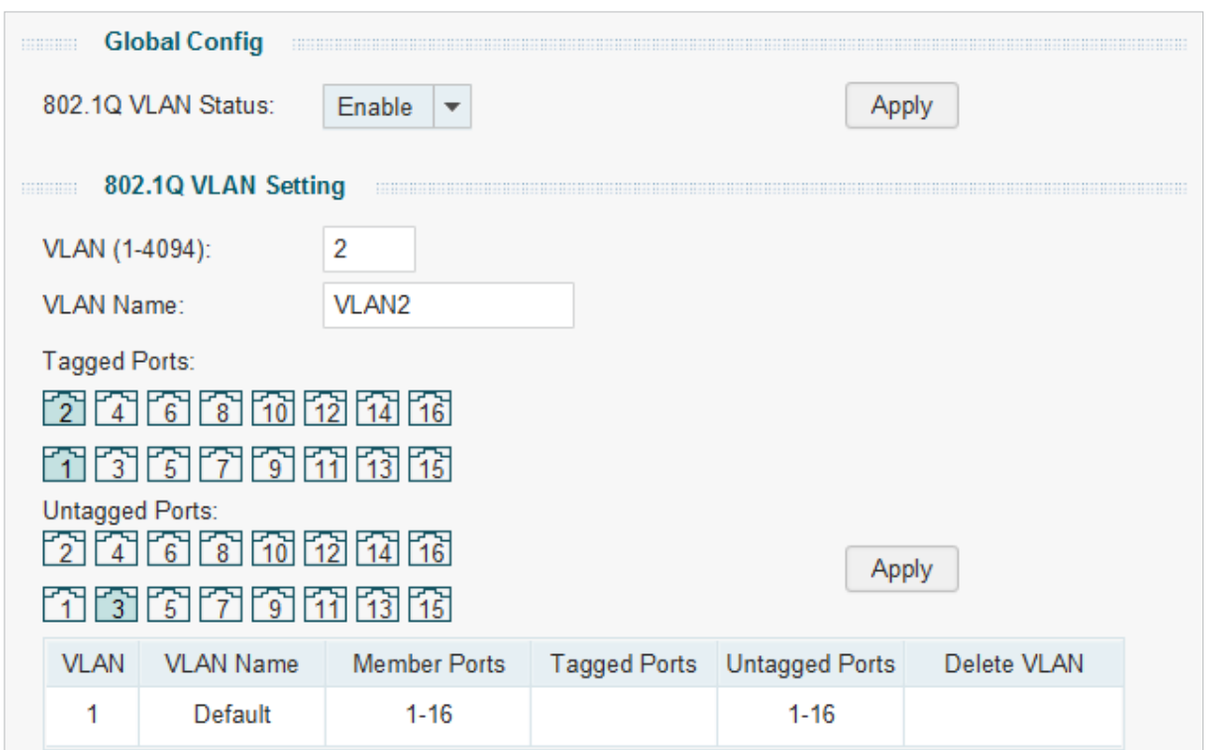
To complete the 802.1Q VLAN configuration, follow these steps:

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

4.1 Configuring the VLAN

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

Figure 4-1 Configuring 802.1Q VLAN



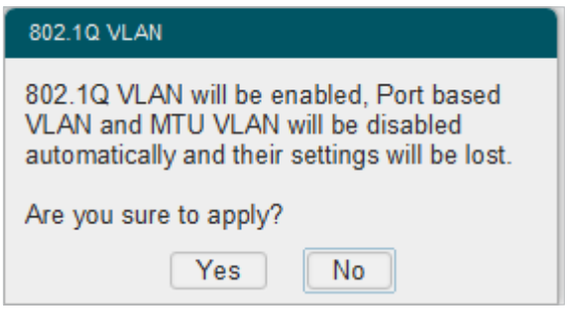
Follow these steps to configure the VLAN:

1) In the **Global Config** section, Select the 802.1Q VLAN status as **Enable** from the drop-down list. Click **Apply**.

802.1Q VLAN Status	Enable or disable the 802.1Q VLAN mode.

2) The following page will be displayed. Click **Yes**.

Figure 4-2 Being Sure to Enable 802.1Q VLAN

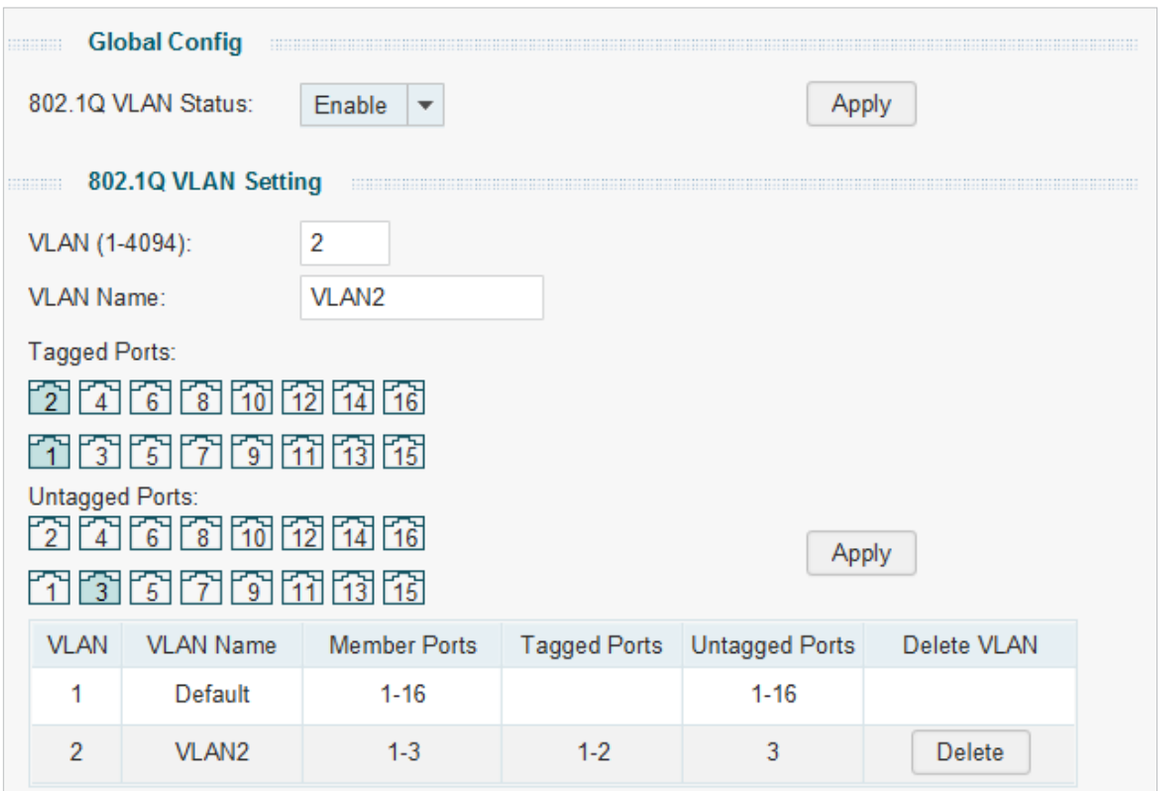


3) In the **802.1Q VLAN Setting** section, enter a VLAN ID and a VLAN name for identification to create a VLAN. Select the untagged port(s) and the tagged port(s) respectively to add to the created VLAN based on the network topology. Click **Apply**.

VLAN (1-4094)	Enter a VLAN ID, which rages from 1 to 4094, for identification.
VLAN Name	Enter a VLAN name for identification. The VLAN name should not be more than 10 characters using digits, letters, hyphens, and underlines only.
Tagged Ports / Untagged Ports	Select the ports to add to the VLAN as tagged ports or untagged ports. The unselected ports do not forward frames in the target VLAN. **Tagged Ports**: Tagged ports forward frames in the target VLAN with the current VLAN tags remained. **Untagged Ports**: Untagged ports forward frames in the target VLAN after removing the VLAN tags.

4) You can verify the configuration result of 802.1Q VLAN in the table. You can delete a VLAN as you wish by selecting the VLAN and clicking **Delete**.

Figure 4-3 Verifying the Configuration Result



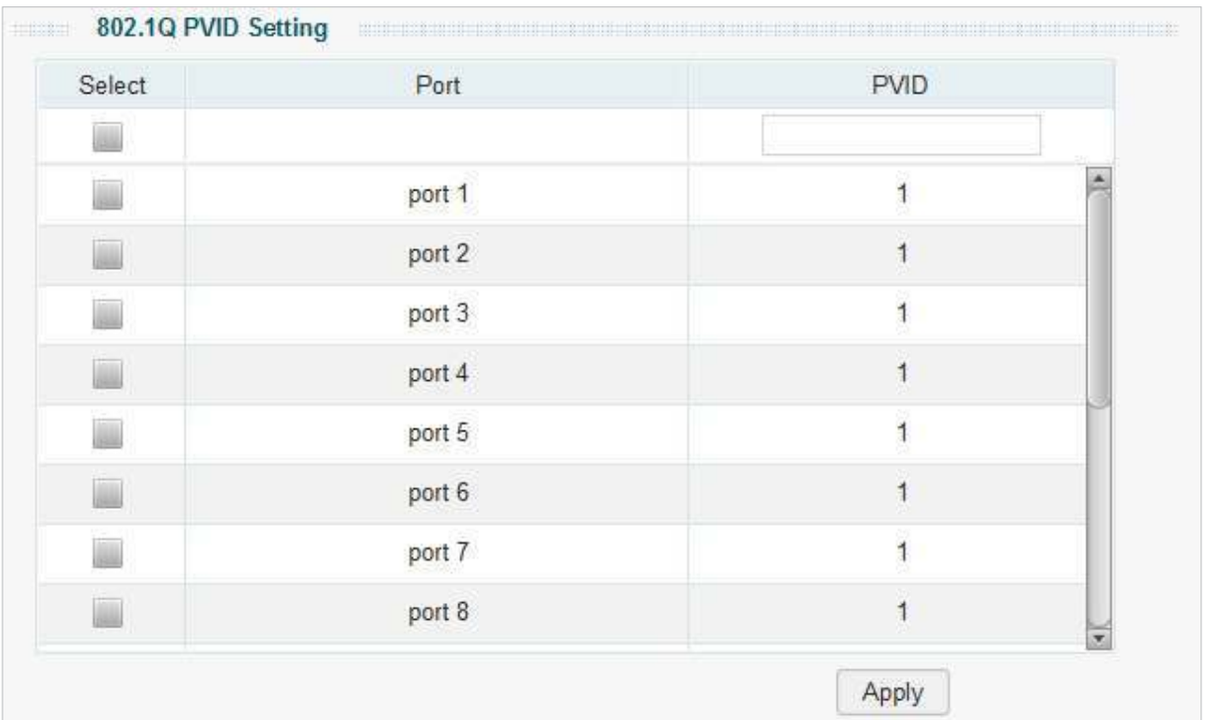
Note:

- 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 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 PVID Setting** to load the following page.

Figure 4-4 Configuring 802.1Q PVID



Follow these steps to configure the PVID:

1) Select the ports and set the PVID for the ports.

PVID	Set the PVID for the ports. The PVID ranges from 1 to 4094.

2) Click **Apply.**

Note:

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

5 Configuration Example for 802.1Q VLAN

5.1 Network Requirements

- Offices of Department A and Department B in the company are located in different places, and some computers in different offices are connected to the same switch.
- It is required that computers can communicate with each other in the same department but not with computers in the other department.

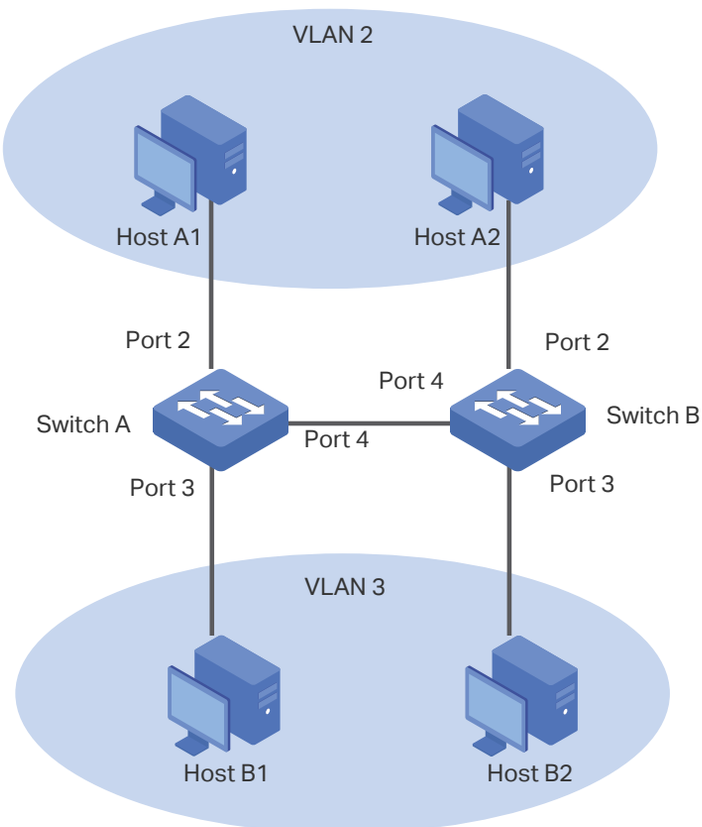
5.2 Configuration Scheme

- Divide computers in Department A and Department B into two VLANs respectively so that computers can communicate with each other in the same department but not with computers in the other department.
- Terminal devices like computers usually do not support VLAN tags. Add untagged ports to the corresponding VLANs and specify the PVID.
- The intermediate link between two switches carries traffic from two VLANs simultaneously. Add the tagged ports to both VLANs.

5.3 Network Topology

The figure below shows the network topology. Host A1 and Host A2 are in Department A, while Host B1 and Host B2 are in Department B. Switch A and Switch B are located in two different places. Host A1 and Host B1 are connected to port 2 and port 3 on Switch A respectively, while Host A2 and Host B2 are connected to port 2 and port 3 on Switch B respectively. Port 4 on Switch A is connected to port 4 on Switch B.

Figure 5-1 Network Topology



Demonstrated with TL-SG1016PE, the following section provides configuration steps. The configuration steps on both switches are similar, here we take Switch A for example.

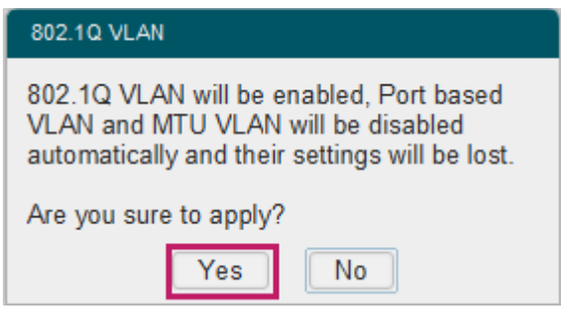
1) Choose the menu **VLAN > 802.1Q VLAN** to load the following page. In the **Global Config** section, Select the 802.1Q VLAN status as **Enable** from the drop-down list. Click **Apply**.

Figure 5-2 Configuring 802.1Q VLAN



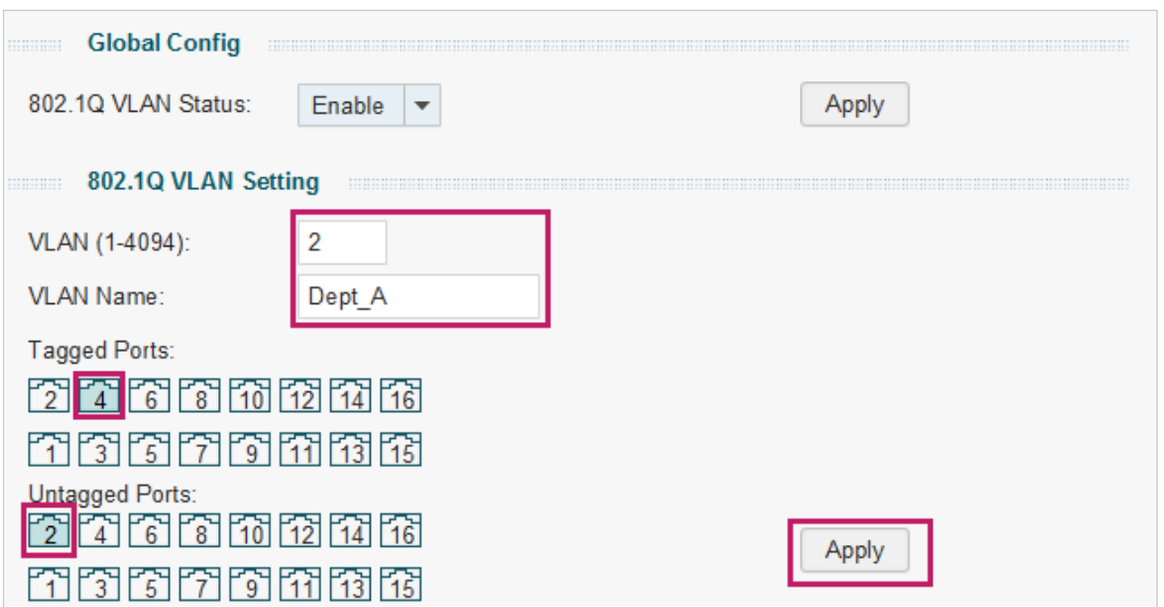
2) The following page will be displayed. Click **Yes**.

Figure 5-3 Enableing 802.1Q VLAN



3) The following page will be displayed. In the **802.1Q VLAN Setting** section, specify the VLAN ID as **2**, specify the VLAN name as **Dept_A**. Add port 4 to the VLAN as a tagged port. Add port 2 to the VLAN as an untagged port. Click **Apply**.

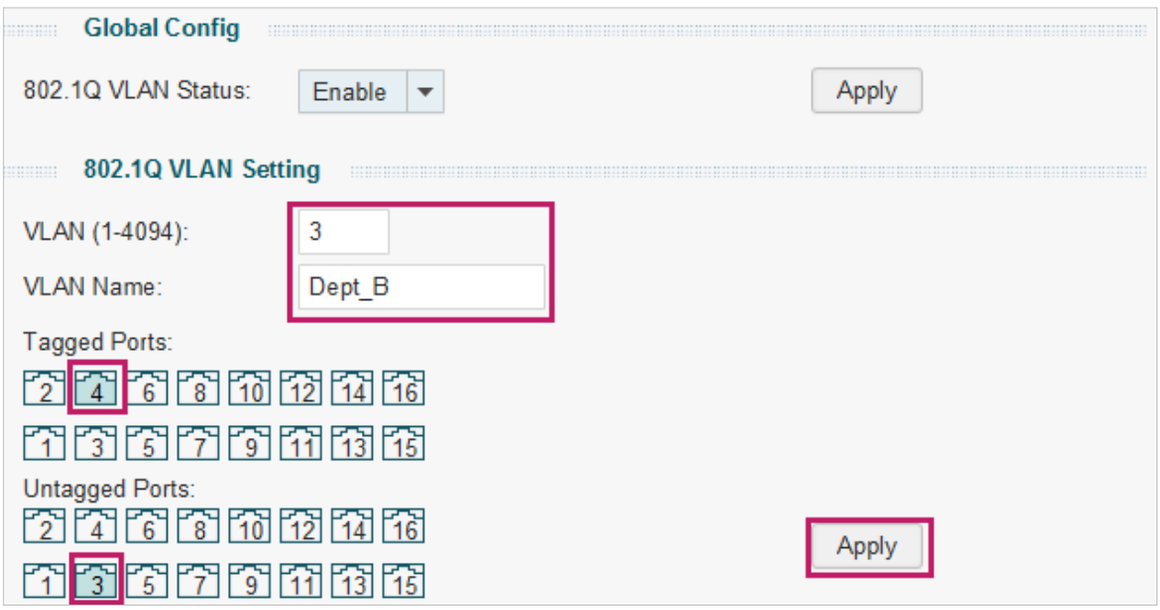
Figure 5-4 Creating VLAN 2 and Adding Ports to the VLAN



4) Choose the menu **VLAN > 802.1Q VLAN** to load the following page. In the **802.1Q VLAN Setting** section, specify the VLAN ID as **3**, specify the VLAN name as **Dept_B**. Add

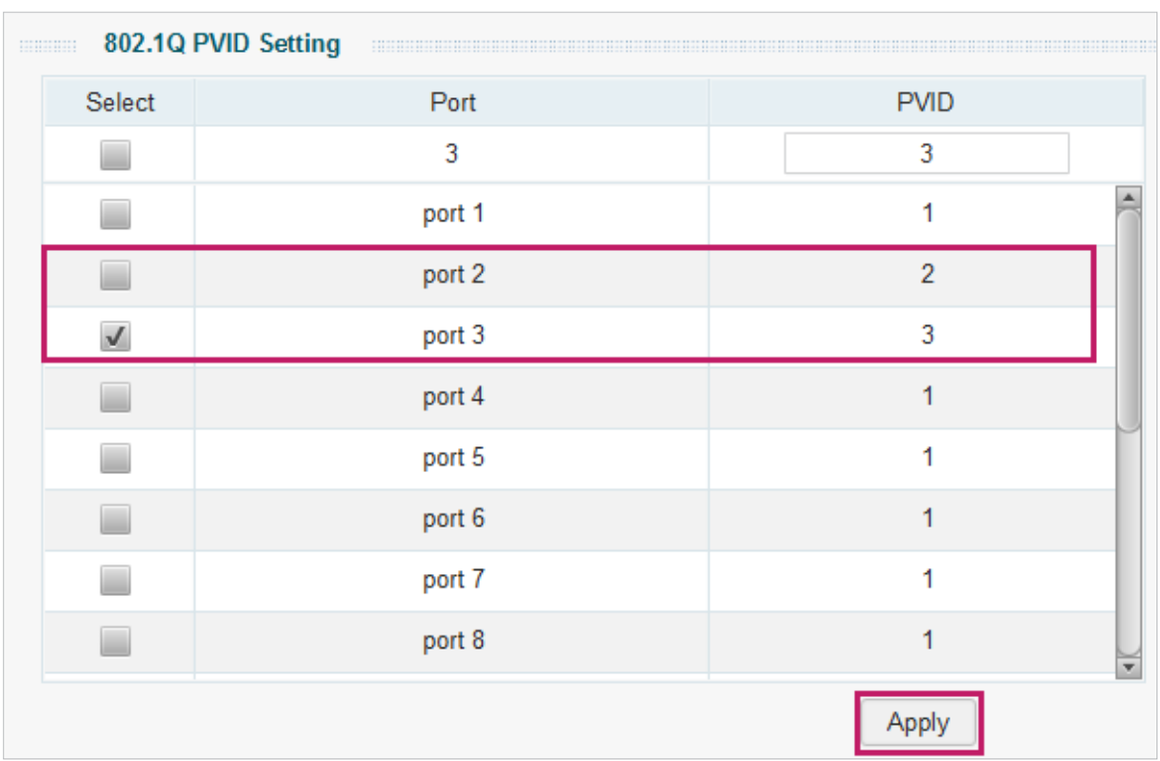
port 4 to the VLAN as a tagged port. Add port 3 to the VLAN as an untagged port. Click **Apply**.

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



5) Choose the menu **VLAN > 802.1Q VLAN PVID Setting** to load the following page. Set the PVID of port 2 as 2 and click **Apply**. Set the PVID of port 3 as 3 and click **Apply**.

Figure 5-6 Configuring 802.1Q PVID



Part 6

Configuring QoS

CHAPTERS

1. QoS
2. Configuring Basic QoS
3. Configuring Bandwidth Control
4. Configuring Storm Control
5. Configuration Example for Basic QoS

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 to certain types of traffic.

1.2 Supported Features

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

QoS Basic

The switch classifies the ingress packets, maps the packets to different priority queues and then forwards the packets to implement QoS function.

Bandwidth Control

Bandwidth Control functions to control the ingress traffic rate and egress traffic rate on each port via configuring the available bandwidth of each port. In this way, the network bandwidth can be reasonably distributed and utilized.

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 (DSCP/802.1P Based).

- Port Based

The port based QoS mode supports four priority queues, which are labeled as 1 (Lowest), 2(Normal), 3 (Medium) and 4 (Highest).

In this mode, the switch prioritizes packets according to their ingress ports, regardless of the packet field or type.

- 802.1P Based

802.1P defines the first three bits in 802.1Q Tag as PRI field. The PRI values are from 0 to7. The tagged packets are mapped to 4 priority levels based on the PRI value (Lowest=0, 1; Normal=2, 3; Medium=4, 5; Highest=6, 7).

In this mode, the switch only prioritizes packets with VLAN tag, regardless of the IP header of the packets.

- DSCP/802.1P Based

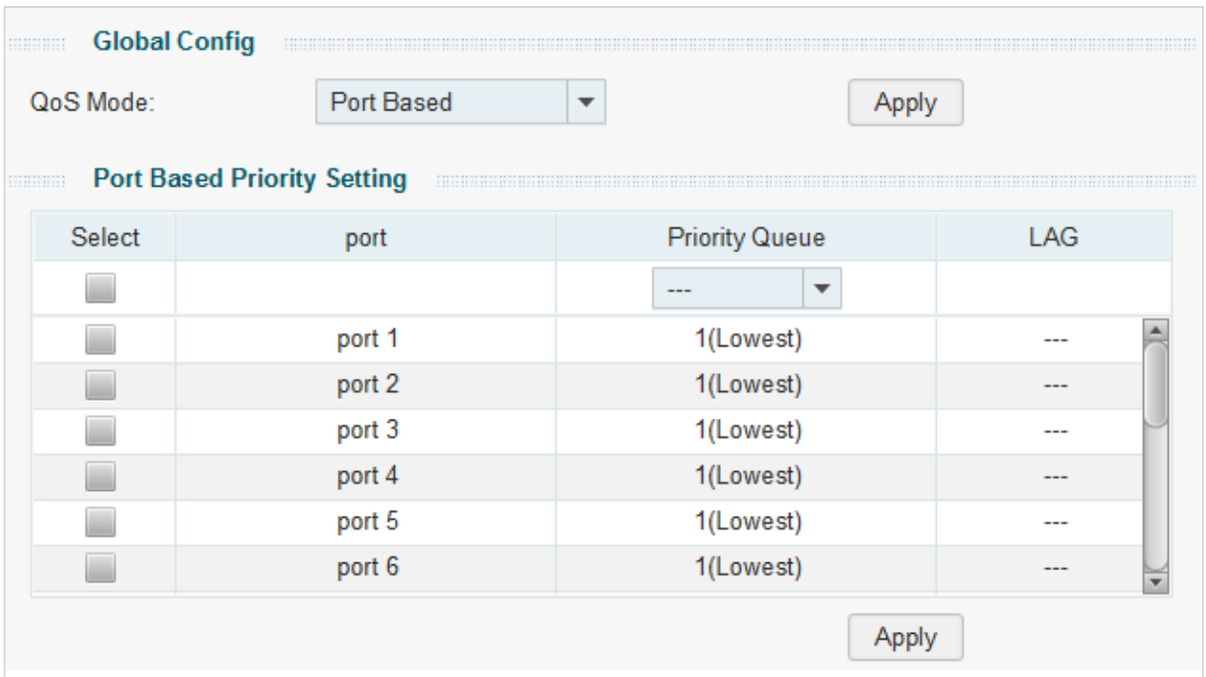
DSCP priority determines the priority of packets based on the ToS (Type of Service) field in their IP header. RFC 2474 re-defines the ToS field in the IP packet header as DS field. The first six bits of the DS field is used to represent DSCP priority. The DSCP values are from 0 to 63. The IP packets are mapped to 4 priority levels based on the DSCP value (Lowest=0-15; Normal=16-31; Medium=32-47; Highest=48-63).

In this mode, the switch prioritizes packets with IP header based on DSCP priority first. Then, the switch prioritizes packets with VLAN tag but without IP header based on the PRI field. Finally, the switch prioritizes packets without VLAN tag or IP header based on port priority.

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 Config** section, select QoS mode as **Port Based.** Click **Apply**.

QoS Mode	Select the QoS mode. **Port Based**: In port based mode, the switch prioritizes packets according to their ingress ports, regardless of the packet field or type.

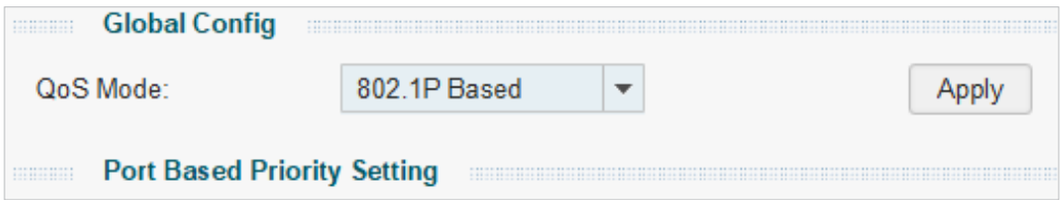
2) In the **Port Based Priority Setting** section, select the desired ports and specify the priority queue for the ports. Click **Apply**.

Priority Queue	Specify the priority queue that the packets from the port are mapped to. The priorities are labeled as 1, 2, 3, and 4. Among them, the bigger value means the higher priority.
LAG	Displays the LAG which the port belongs to.

2.2 Configuring QoS in 802.1P Based Mode

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

Figure 2-2 Configuring Basic QoS in 802.1P Based Mode



Follow these steps to configure QoS in 802.1P based mode:

1) Select QoS mode as **802.1P Based.**

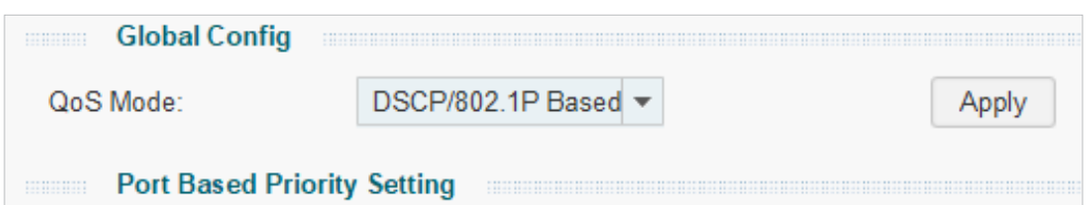
QoS Mode	Select the QoS mode . **802.1P Based**: In 802.1P based mode, the tagged packets are mapped to 4 priority levels based on the Pri value in 802.1Q tag (Lowest = 0, 1; Normal =2, 3; Medium= 4, 5; Highest = 6, 7). The switch only prioritizes packets with VLAN tag, regardless of the IP header of the packets.

2) Click **Apply**.

2.3 Configuring QoS in DSCP/802.1P Based Mode

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

Figure 2-3 Configuring Basic QoS in DSCP/802.1P Based Mode



Follow these steps to configure QoS in DSCP/802.1P based mode:

1) Select QoS mode as **DSCP/802.1P Based.**

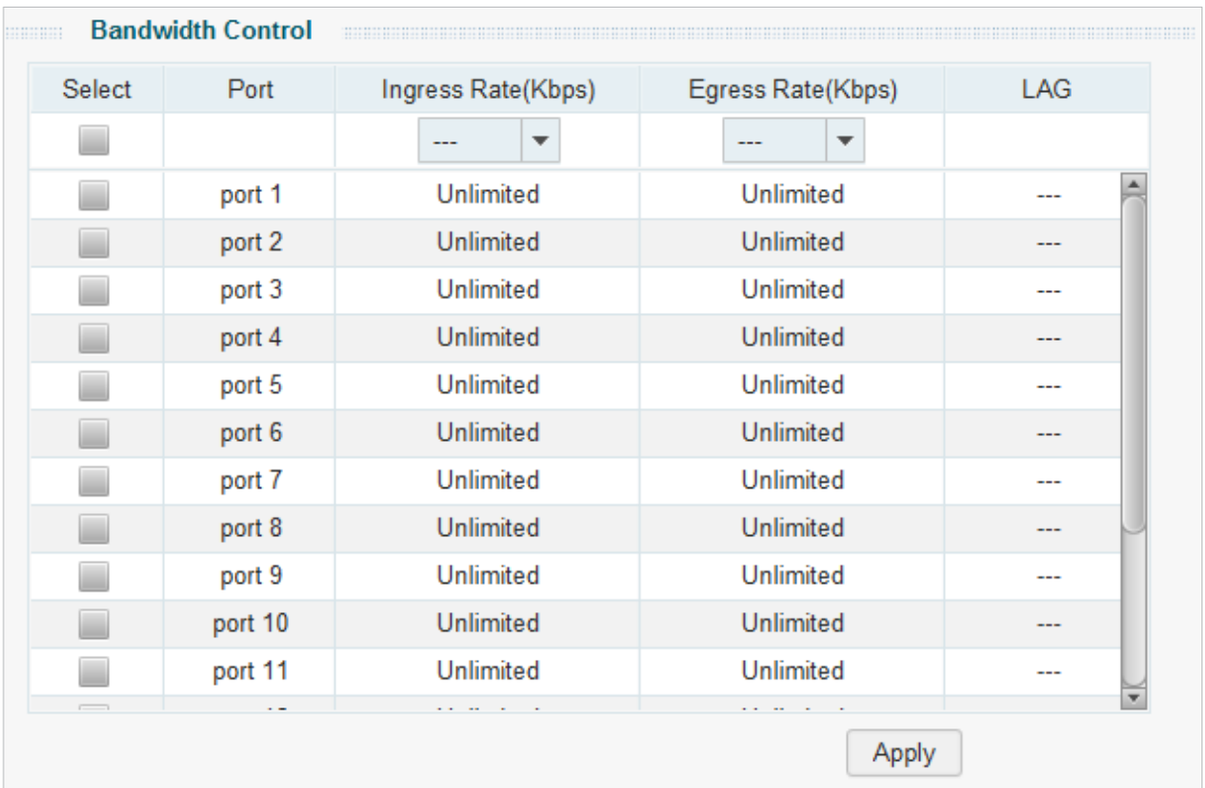
QoS Mode	Select the QoS mode. **DSCP/802.1P Based**: In this mode, the IP packets are mapped to 4 priority levels based on the DSCP value (Lowest= 0-15; Normal = 16-31; Medium = 32-47; Highest = 48-63). The switch prioritizes packets with IP header based on DSCP priority first. Then, the switch prioritizes packets with VLAN tag but without IP header based on the PRI field. Finally, the switch prioritizes packets without VLAN tag or IP header based on port priority.

2) Click **Apply**.

3 Configuring Bandwidth Control

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

Figure 3-1 Configuring Bandwidth Control



Follow these steps to configure bandwidth control:

1) Select the desired ports and configure the ingress rate and egress rate for the ports.

Ingress Rate (Kbps)	Configure the bandwidth for receiving packets on the port. You can select a rate from the drop-down list or select “Manual” to set Ingress rate, the system will automatically select integral multiple of 64Kbps that is closest to the rate you entered as the real ingress rate.
Egress Rate (Kbps)	Configure the bandwidth for sending packets on the port. You can select a rate from the drop-down list or select “Manual” to set egress rate, the system will automatically select integral multiple of 64Kbps that is closest to the rate you entered as the real egress rate.
LAG	Displays the LAG which the port belongs to.

2) Click **Apply**.

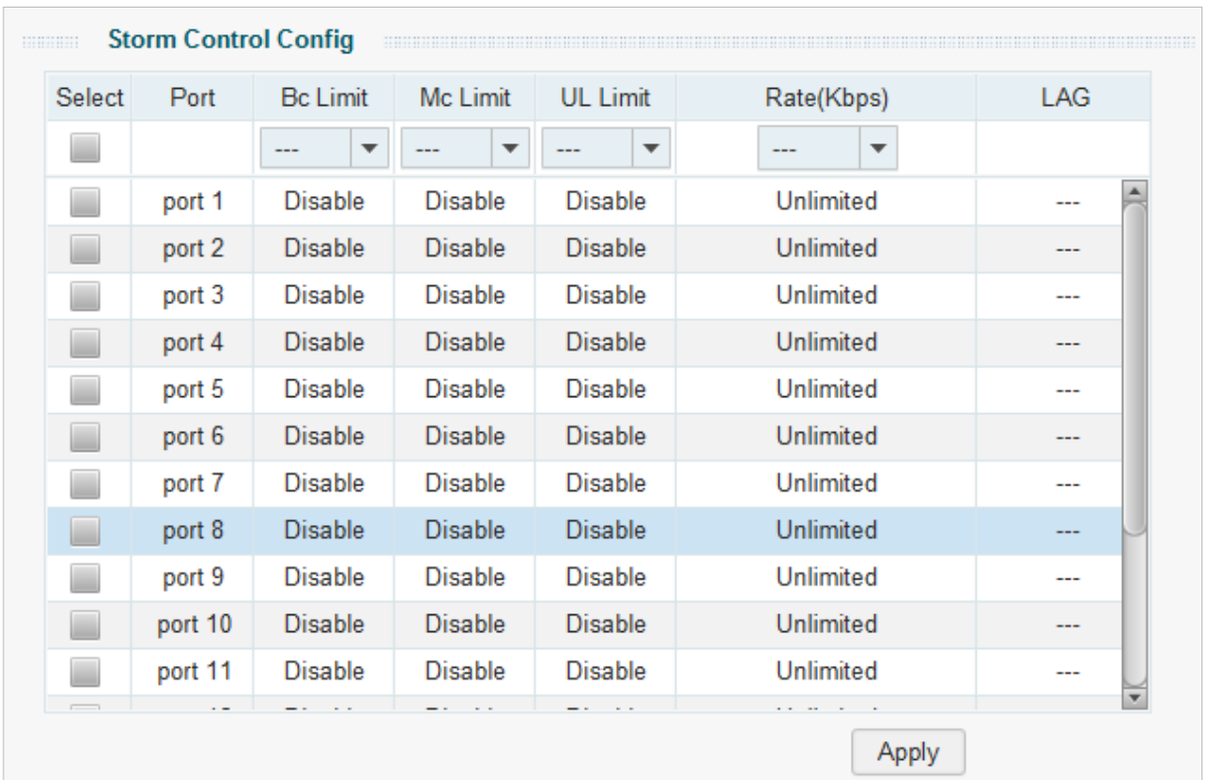
Note:

- 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, bandwidth control 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



Follow these steps to configure storm control:

1) Select the desired ports and configure the upper rate limit for forwarding broadcast packets, multicast packets and UL-frames (Unknown unicast frames).

Bc Limit	Enable or disable the broadcast control feature for the port.
Mc Limit	Enable or disable the multicast control feature for the port.
UL Limit	Enable or disable the UL-Frame (unknown unicast frame) control feature for the port.
Rate (Kbps)	Specify the upper rate limit for receiving the specified packet on the port. The packet traffic exceeding the bandwidth will be discarded.
LAG	Displays the LAG the port belongs to.

2) Click **Apply**.

Note:

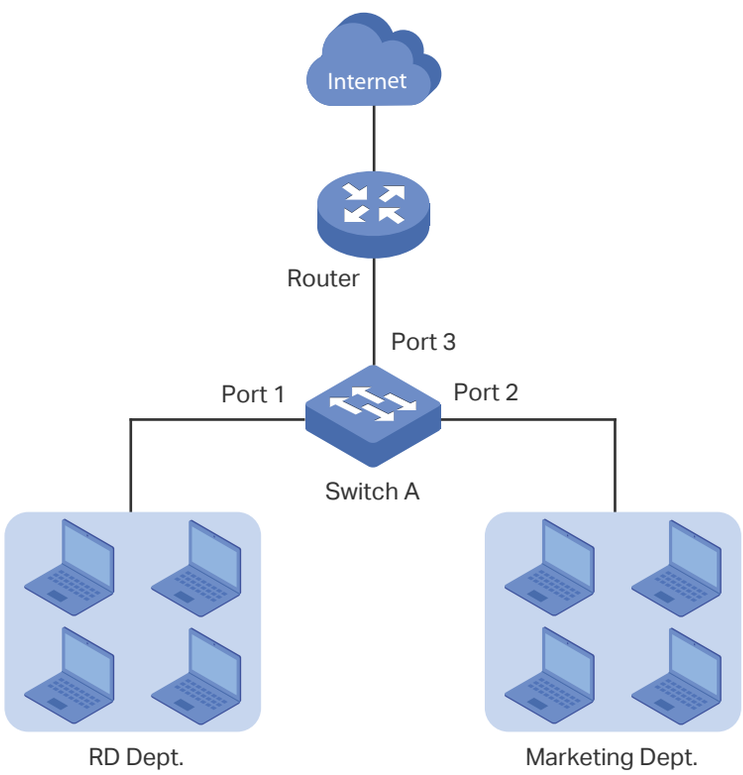
- For a port, the storm control feature and the ingress rate control feature cannot be enabled at the same time. If you enable storm control for a port, ingress rate control will be disabled for that port automatically.
- For ports in the same LAG, storm control should be configured the same to ensure 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 priority than the packets from the RD department. Follow these procedures to configure QoS in port based mode.

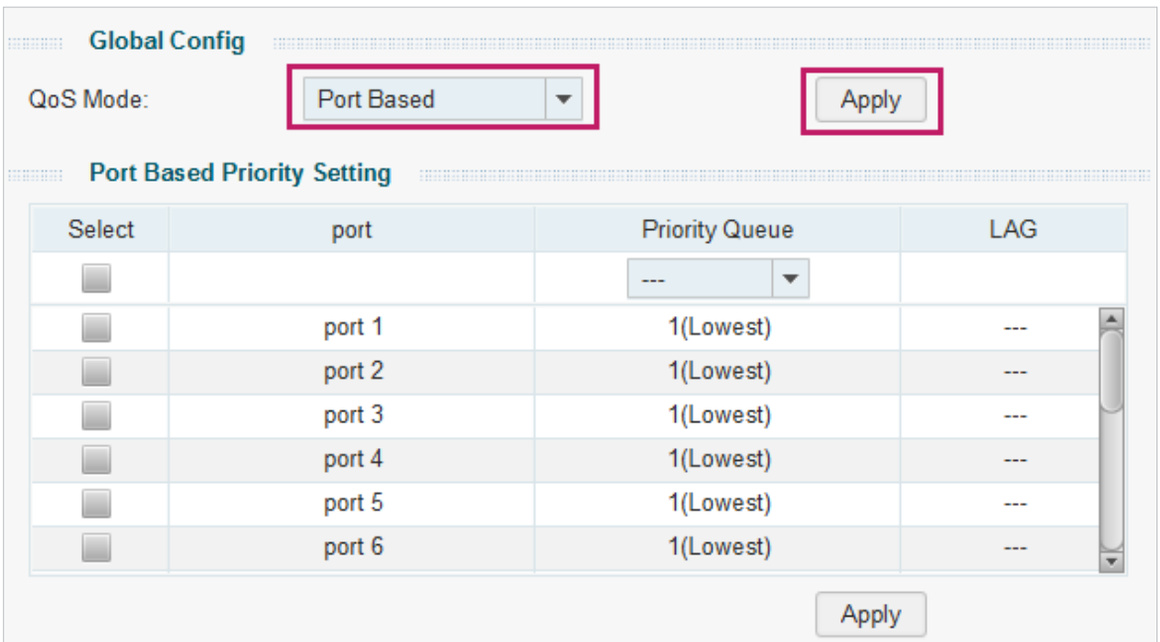
1) Enable port based mode.
2) Map port 1 and port 2 to different priorities queues.

Demonstrated with TL-SG1016PE, the following section provides configuration steps.

5.3 Configuration Steps

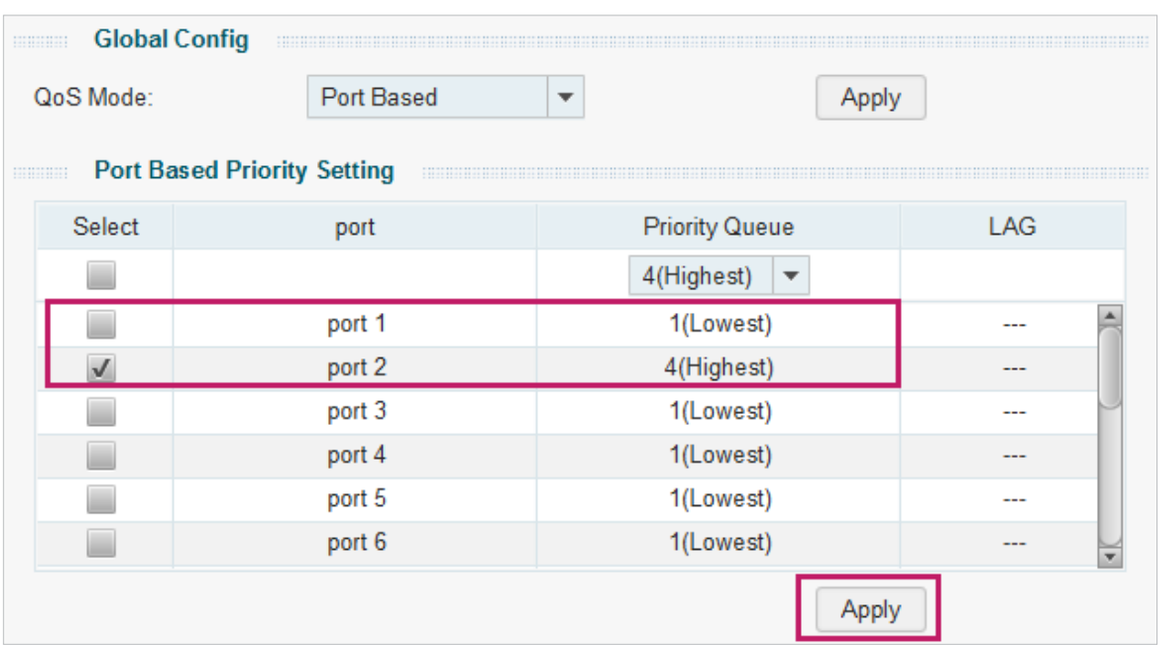
1) Choose the menu **QoS > QoS Basic** to load the following page. In the **Global Config** section, select QoS mode as **Port Based.** Click **Apply**.

Figure 5-2 Configuring Basic QoS in Port Based Mode



2) In the **Port Based Priority Setting** section, Set the priority queue for port 1 as **1(Lowest)** and click **Apply**. Set the priority queue for port 2 as **4(Highest)** and click **Apply**.

Figure 5-3 Setting Different Priorities for Port 1 and Port 2



Part 7

Configuring PoE

CHAPTERS

1. Overview
2. Configuring PoE

1 Overview

Note:

Only TL-SG1016PE and TL-SG1218MPE support the PoE configuration.

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.

Some devices such as IP phones, access points (APs) and cameras may be located far away from the AC power source in actual use. PoE can provide power for these devices without requiring to deploy power cables. This allows a single cable to provide both data connection and electric power for the device.

- PSE

Power sourcing equipment (PSE) is a device that provides power for PDs on the Ethernet, for example, the PoE switch. PSE can detect the PDs and determine the device power requirements.

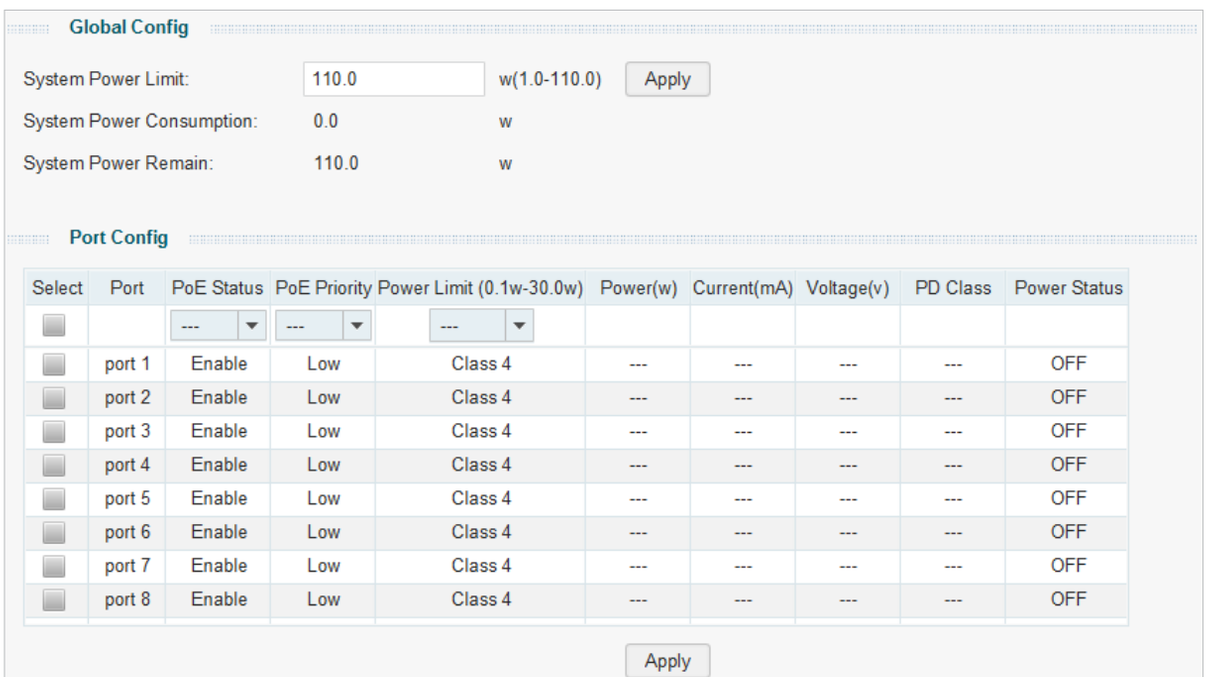
- PD

Powered device (PD) is a device receiving power from the PSE, for example, IP phones and access points. According to whether PDs comply with IEEE standard, they can be classified into standard PDs and non-standard PDs. Only standard PDs can be powered via TP-Link PoE switches.

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	Configure 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 port. The port can supply power to the PD when its status is enable.
PoE Priority	Select the priority level 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-30 w)	Specify the maximum power the corresponding port can supply. The following options are provided: **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. **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 real-time power status of the port.

Part 8

Searching Help

CHAPTERS

1. Help
2. Searching Online Help
3. Viewing Information About the Utility

1 Help

1.1 Overview

With the Help function, you can search for online help and view the information about the utility.

1.2 Supported Features

Online Help

You can access the TP-Link support website and get the online user guide for the Easy Smart Configuration Utility (the latest copy of this manual) and the products.

About

You can view the information about the utility, including the switch models supported by the utility, the version of the utility software, and copyright information.

2 Searching Online Help

Choose the menu **Help > Help** to load the following page. You can click **Online Help** to access the TP-Link support website and get the online user guide for the Easy Smart Configuration Utility (the latest copy of this manual) and the products.

Figure 2-1 Searching Online Help



3 Viewing Information About the Utility

Choose the menu **Help > About** to load the following page. You can view the information about the utility, including the switch models supported by the utility, the version of the utility software, and copyright information.

Figure 3-1 Viewing Information About the Utility

