

User Guide

Easy Smart Configuration Utility

1910013735 REV5.2.0

August 2024

CONTENTS

About This Guide

Intended Readers	1
Conventions	1
More Information	1

Getting Started

ntroduction	4
nstalling the Configuration Utility	5
Discovering Switches	9
Discovering the Switches in the Network	9
Configuring IP Setting for the Switch	10
Logging Into the Switch	11

Managing System

System	14
Overview	14
Supported Features	14
Configuring System Info	15
Viewing the System Information	15
Specifying the Device Description	16
Configuring IP	
Configuring LED (Only for Certain Devices)	19
Managing User Account	
Backing Up and Restoring	21
Saving the Current Configuration	21
Restoring to the Previous Configuration	22
Rebooting System	25
Resetting the System	26
Upgrading the Firmware	27

Switching

Swite	ching	30
	Overview	.30
	Supported Features	.30

Configuring Ports	
Configuring IGMP Snooping	
Configuring LAG	35
Configuration Example	
Example for Configuring IGMP Snooping	36
Network Requirements	36
Configuration Scheme	36
Configuration Steps	
Example for Configuring LAG	
Network Requirements	
Configuration Steps	

Monitoring

Aonitoring	11
Overview4	11
Supported Features4	11
/iewing Port Statistics	12
Configuring Port Mirror	14
esting the Cable4	16
Configuring Loop Prevention	18

Configuring VLAN

Dverview	0
Configuring MTU VLAN	52
Configuring Port Based VLAN	3
Configuring 802.1Q VLAN	5
Configuring the VLAN	5
Configuring the PVID	8
Configuration Example for 802.1Q VLAN5	9
Network Requirements5	;9
Configuration Scheme	;9
Configuration Steps6	51

Configuring QoS

QoS	5	64
	Overview	64
	Supported Features	64

Configuring Basic QoS	65
Configuring QoS in Port Based Mode	66
Configuring QoS in 802.1P Based Mode	
Configuring QoS in DSCP/802.1P Based Mode	67
Configuring Bandwidth Control	68
Configuring Storm Control	70
Configuration Example for Basic QoS	72
Network Requirements	72
Configuration Scheme	72
Configuration Steps	73

Configuring PoE (Only for Certain Devices)

PoE	75
Overview	75
Supported Features	75
Configuring PoE	77
Configuring PoE Auto Recovery	79
Configuring Extend Mode	
Appendix: Default Parameters	

Searching Help

lelp	. 84
Overview	84
Supported Features	84
Searching Online Help	. 85
/iewing Information About the Utility	. 86

About This Guide

This User 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

When using this guide, notice that features available in Easy Smart Switch may vary by model and software version. The availability of Easy Smart Switch may also vary by region or ISP. All images, steps, and descriptions in this guide are only examples and may not reflect your actual experience. Throughout the guide, we will take TL-SG1016PE as the switch to be configured for example.

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

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:

PoE budget calculations are based on laboratory testing. Actual PoE power budget is not guaranteed and will vary as a result of client limitations and environmental factors.

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/?type=smb.
- The Installation Guide (IG) can be found inside the package of the switch or at Download Center at https://www.tp-link.com/support/?type=smb.

- The authentication information can be found where you find this guide.
- Specifications can be found at Download Center at

https://www.tp-link.com/support/?type=smb.

- To ask questions, find answers, and communicate with TP-Link users or engineers, visit https://community.tp-link.com/business 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/?type=smb.

Part 1 Getting Started

CHAPTERS

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

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/business-networking/*.

2 Installing the Configuration Utility

Figure 2-1 Preparing Setup

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/business-networking/*.
- 2) Decompress the packet and double click the executable file (with the file extension **.exe**) to launch the InstallShield Wizard. The following page will be displayed.

Easy Smart Configuration Utility - InstallShield Wizard
Preparing Setup Please wait while the InstallShield Wizard prepares the setup.
Easy Smart Configuration Utility Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

User Guide 5

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

Figure 2-2 Launching the Installshield Wizard

Easy Smart Configuration Uti	lity - InstallShield Wizard	x
	Welcome to the InstallShield Wizard for Easy Smart Configuration Utility The InstallShield Wizard will install Easy Smart Configuration Utility on your computer. To continue, click Next.	¢
	< Back Next > Cance	el

 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

Easy Smart	Configuration Utility - InstallShield Wizard
	Pestination Location Ider where setup will install files.
	Install Easy Smart Configuration Utility to: C:\\TP-LINK\Easy Smart Configuration Utility Change
InstallShield –	
	< Back Next > Cancel

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

Easy Smart Configuration Utility - InstallShield Wizard	×
Ready to Install the Program The wizard is ready to begin installation.	1
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back. Click Cancel to the wizard.	exit
InstallShield	e

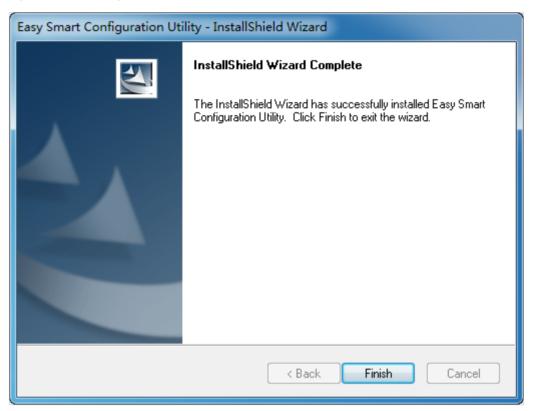
6) Click **Install** to load the following page. The wizard will install Easy Smart Configuration Utility.

Figure 2-5 Installing the Utility

Easy Smart Configuration Utility - InstallShield Wizard	×
Setup Status	4
The InstallShield Wizard is installing Easy Smart Configuration Utility	
Installing	
C:\\TP-LINK\Easy Smart Configuration Utility\jre\bin\client\jvm.dll	
InstallShield	
Cano	el

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 in 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

the switch discovery process.

_ _ __ _ _ _

Double click 💸 to launch the Easy Smart Configuration Utility. It will search the network for TP-Link Easy Smart switches automatically. The discovered switches are listed as below.

Figure 3-1 Discovering Switches

Ptp-link						
Discovered Swite	thes					
Product	Device Description	MAC Address	IP Address	Located on IP Network	IP Setting	Login
TL-SG1016PE	TL-SG1016PE	A8-6E-84-A3-8F-3D	192.168.0.1	192.168.0.10	*	1
Help]				Refre	sh
- Note:						
• The	e maximum number o	of the discovered swit	tches is 30.			
		ne left bottom to acco ou have access to the		nk support website f	or more h	elp
• Ead	ch time the network	environment changes	s, it is recomm	ended to click Refre	sh to rest	tart

_ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ _ . _ . _ . _ . _ . _ . _ . _ . _ . _ . _ . _

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

IP Setting	
MAC Address:	A8-6E-84-A3-8F-3D
Hardware Version:	TL-SG1016PE 6.0
Firmware Version:	1.0.0 Build 20240417 Rel.53354
Device Description:	TL-SG1016PE
DHCP Setting:	Disable 💌
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
User Name:	admin
Password:	
, accrioid.	
Apply	Cancel
Apply	Cancer

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.

1)

2)

ateway DHCP ICP settir	Enter the subnet mask of the switch. The default subnet mask of the switch is 255.255.255.0. Enter the default gateway of the switch.
DHCP ICP settir	ng as Enable.
ICP settir	•
	•
user nan	ne and password. The user name and password are both admin by
ly.	
ote:	
fault gatev	e DHCP setting, the switch will try to obtain IP address, subnet mask, and way from the DHCP server in the network. If the switch cannot get IP settings CP server, it will use the default IP address of 192.168.0.1 and subnet mask of 0 .
y f	te: ou enabl ault gatev n the DH

3.3 Logging Into the Switch

Select the switch which you want to log into, and click **1** to load the following page.

Figure 3-3	Logging Into the Switch
	P tp-link
	1 admin
	â ·····
	✓ Remember Me
	Login

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.

Ptp-link							– C	
System	Switching	Monitoring	VLAN	QoS	PoE	Help	A 1	Hom
> System Info	Sys	tem Information						
IP Setting	Device	Description:	TL-SG1016	SPE				
LED On/Off	MAC A	ddress:	A8-6E-84-A	\3-8F-3D				
	IP Add	ress:	192.168.0.	1				
 User Account 	Subnet		255.255.25	5.0				
 Backup and Restore 		Gateway:	0.0.0.0		D. 1 5005 /			
 System Reboot 		are Version: are Version:	1.0.0 Build TL-SG1016		Rel.53354			
 System Reset Firmware Upgrade 	Device	Description:	TL-SG101	6PE		Apply		
	Note: T	The length of devi	ce description	n should na	ot be more	than 32 characters.		
Note:	can click 🕋	1						

Figure 3-4 Launching the Configuration Interface

- 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. Configuring LED (Only for Certain Devices)
- 5. Managing User Account
- 6. Backing Up and Restoring
- 7. Rebooting the System
- 8. Resetting the System
- 9. 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.

LED On/Off (Only for Certain Devices)

You can turn on/off the LED with one click.

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/business-networking/* 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

System Information	
Device Description:	TL-SG1016PE
MAC Address:	A8-6E-84-A3-8F-3D
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
Firmware Version:	1.0.0 Build 20240417 Rel.53354
Hardware Version:	TL-SG1016PE 6.0
Device Description:	TL-SG1016PE Apply

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

	System Information	
D	Device Description:	TL-SG1016PE
N	AC Address:	A8-6E-84-A3-8F-3D
IF	P Address:	192.168.0.1
S	Subnet Mask:	255.255.255.0
D	Default Gateway:	0.0.0.0
F	irmware Version:	1.0.0 Build 20240417 Rel.53354
н	lardware Version:	TL-SG1016PE 6.0
D	Device Description:	TL-SG1016PE Switch Apply

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

System IP Addre	ess Setting
DHCP Setting:	Enable v
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0 Apply

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

- 1) Select DHCP setting as Enable from the drop-down list.
- 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

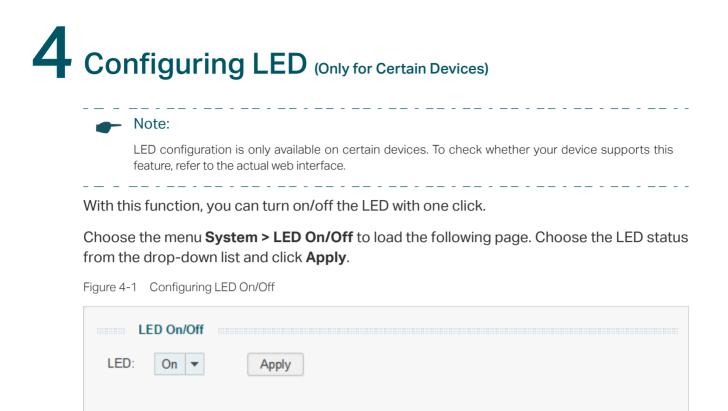
System IP Address	sSetting		
DHCP Setting:	Disable 🔻		
IP Address:	192.168.0.1		
Subnet Mask:	255.255.255.0		
Default Gateway:	0.0.0.0	(Apply

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.



5 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 5-1 Managing the User Account

System User Settin	ng	
User Name:	admin	
Current Password:		
New Password:		
Confirm Password:		Apply

Follow these steps to configure the user account:

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

User Name	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. By default, the password is admin .
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**.

6 Backing Up and Restoring

With the Backup and Restore function, you can:

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

6.1 Saving the Current Configuration

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

Figure 6-1	Backing	Up System	Config
i iguio o i	Duorang		COLING

System Config	n het de een de Staat en de staar kan de staat d	
Backup Config		
Buonup bornig		
Baakap boning		
System Config	Restore	

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.

Save As	✓ Search New folder	<u>×</u> م
		~
Organize 🔻 New folder	8== •	• • • •
🎝 Music 🔷 Name	Date modified Type	Size
E Pictures		
🚽 Videos	No items match your search.	
📄 xun		
Nomegroup		
Normal Computer		
🚢 Local Disk (C:)		
👝 Local Disk (D:)		
👝 Local Disk (E:)		
🔮 CD Drive (G:) 🗸 🗸		+
File name: 1016PE_Backup.cfg		•
Save as type: Config Files (*.cfg)		-
📤 Hide Folders	Save	ncel

Figure 6-2 Saving the Configuration File

2)

Note:

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

Restoring to the Previous Configuration 6.2

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

System Config	васкир	
Backup Config		
System Config	Restore	

Figure 6-1 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**.

🔀 Open				×
CO V E:\New folder		🗸 🍫 Search	New folder	٩
Organize 🔻 New folder			· ·	0
*	Name	Date modified	Туре	Size
Libraries Documents	1016PE_Backup.cfg	2018/1/26 10:54	CFG File	
J Music				
Pictures				
Videos				
📄 xun				
輚 Homegroup				
🖳 Computer				
🚢 Local Disk (C:)				
👝 Local Disk (D:)				
👝 Local Disk (E:) 🚽	r i	11		Þ
	ne: 1016PE_Backup.cfg	- Config F	iles (*.cfg)	•
		Оре		: .::

Figure 6-2 Choosing the Configuration File

2) The following page will be displayed.

Figure 6-3 Choosing the Configuration File

		ckup	System Config Back
			Backup Config
		store	System Config Resto
Restore Config	le	Choose File	1016PE_Backup.cfg
Restore Config	le	Choose File	1016PE_Backup.cfg

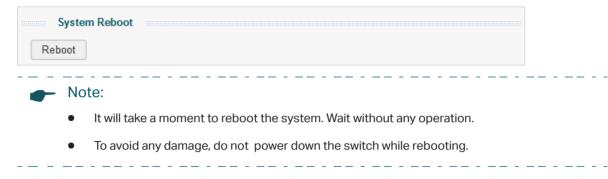
3) Click **Restore Config**, and the following page will be displayed. Click **Yes** to restore the switch to the previous configuration. It will take effect after the switch automatically reboots.

Figure 6-4 Being sure to restore config					
Backup and Restore					
Are you sure to restore config?					
Yes No					
• Note:					
• It will take a moment to restore the config	uration. 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 configur	• After being restored, the current configuration of the switch will be lost.				

7 Rebooting System

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

Figure 7-1 Rebooting the System



8 Resetting the System

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

Figure 8-1 Resetting the System

System Reset	
Reset	

Follow these steps to reset the switch.

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

Figure 8-2 Being Sure to Reset the System

	System Reset
	All the configuration will be clear after system resetting! Are you sure to reset?
	Yes No
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.

9 Upgrading the Firmware

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

Figure 9-1	Upgrading the	Firmware
i iguio o i	opgrading the	1 IIIII Wale

System Upgrade		
	Choose File	Upgrade 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 9-2	Choosing the Firmware

🔀 Open					×
CO V E:\New	folder		🗕 🗲 Search I	New folder	٩
Organize 🔻 New	folder			!≡ ▼ 🔳	0
🔶 Favorites	^	Name	Date modified	Туре	Size
💻 Desktop 鷆 Downloads		TL-SG1016PEv1_en_1.0.1_[20180629-rel58	27.11.2017 11:17	BIN 文件	1
🖳 Recent Places 👌 Music	Ш				
😭 Libraries 📄 Documents					
J Music					
Videos					
🤣 Homegroup		III			۰.
F	ile nan	ne: TL-SG1016PEv1_en_1.0.1_[20180629-rel58]	109]_ı 👻 Upgrade	Files (*.bin) n Cancel	•
					.ai

2) The following page will be displayed.

Figure 9-3 Choosing the Firmware

System Upgrade	
TL-SG1016PEv1_en_1.0.1_ Choose File	Upgrade Firmware

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

Figure 9-4 Being Sure to Upgrade the Firmware

Firmw	are Upgrade	
,	Are you sure to upgrade firmware?	
	Yes No	
- Nc	ote:	
٠	It is recommended to backup the configura	ation before upgrading.
•	-	subnet, you cannot upgrade firmware. Before you s of your PC to ensure your PC and switch are in the
٠	Select the proper software version matchi	ng with your hardware to upgrade.
٠	It will take a moment to upgrade the firmwa	are. Wait without any operation.
٠	To avoid damage, do not power down the	switch while upgrading the firmware.
•	After upgrading, the switch will reboot auto	omatically.

_ - _ _ - _ _ _ _

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.

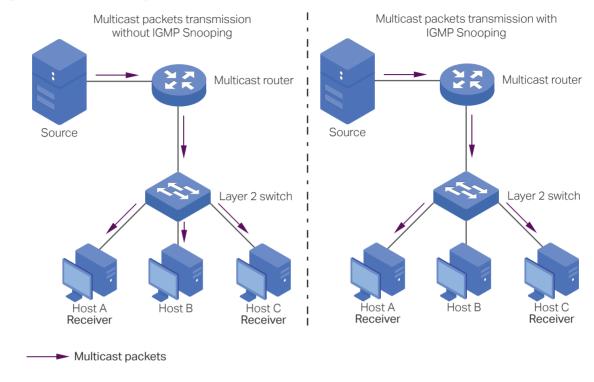
With broadcast, information will be sent to all users in the network no matter they need it or not, wasting network resources and impacting information security.

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.





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

Por	rt Config						
Select	Port	Status	Speed/	Duplex	Flow C	Control	LAG
Select	Fon	Status	Config	Actual	Config	Actual	LAG
		▼	▼		▼		
	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 A	pply.
	No	te:
	•	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

IGMP Snooping			
IGMP Snooping:	Enable	Disable	
Report Message Suppression:	Enable	Disable	Apply
Multicast IP Table			
IP Address	VLAN ID		Ports
239.255.255.250	1		port 1

Follow these steps to configure IGMP Snooping.

2)

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.
In the Multicast II	P 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						
LAG Config						
LAG ID:	LAG1 -	r				
24	6 8 10	12 14 16 Apply				
13	5 7 9	T1 T3 T5				
1467						
LAG T						
Select	LAG ID	Ports				
	LAG1		Â			
	LAG2					
	LAG3					
	LAG4					
	LAG5		•			
		SelectAll Delete				

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:

- 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 2 port members at least and 4 port members at most.

5 Configuration Example

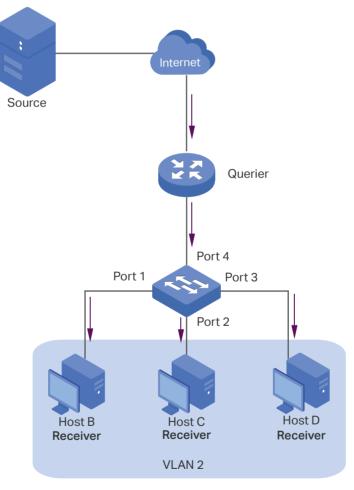
5.1 Example for Configuring IGMP Snooping

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.





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

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.

Global Config		
802.1Q VLAN Status:	Enable 🔻	Apply
802.1Q VLAN Setti	ing	
VLAN (1-4094):	2	
VLAN Name:	VLAN2	
Tagged Ports:		
246870	12 14 16	
TT TT TT TT TT TT	11 13 15	
Untagged Ports:		
	12 14 16	Apply
<u>73</u> 5791	11 13 15	. 444

 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.

802.1Q	PVID Setting	
Select	Port	PVID
	1-4	2
~	port 1	2
~	port 2	2
~	port 3	2
✓	port 4	2
	port 5	1
	port 6	1
	port 7	1
	port 8	1
		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

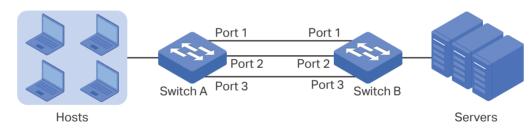
IGMP Snooping: Report Message Suppression:	Enable	DisableDisable	Apply

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.





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 Co	nfiguring LAG		
	LAG1 •	- 	
Select	LAG ID	Ports	
	LAG1	1,2,3	Â
	LAG2		
	LAG3		\cup
	LAG4		
	LAG5		
		SelectAll Delete	

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

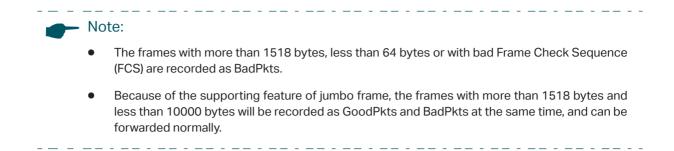
Choose the menu **Monitoring > Port Statistics** to load the following page.

Figure 2-1 Viewing Port Statistics

Port St	atistics					
Port	Status	Link Status	TxGoodPkt	TxBadPkt	RxGoodPkt	RxBadPkt
port 1	Enable	Link Down	0	0	0	0 🚔
port 2	Enable	Link Down	0	0	0	0
port 3	Enable	Link Down	0	0	0	0
port 4	Enable	Link Down	0	0	0	0
port 5	Enable	Link Down	0	0	0	0
port 6	Enable	Link Down	0	0	0	0
port 7	Enable	Link Down	0	0	0	0
port 8	Enable	Link Down	0	0	0	0
port 9	Enable	Link Down	0	0	0	0
port 10	Enable	1000M Full	0	0	0	0
port 11	Enable	Link Down	0	0	0	0
port 12	Enable	1000M Full	0	0	0	0
port 13	Enable	Link Down	0	0	0	0
port 14	Enable	Link Down	0	0	0	0
	F	Call Dates	0	0	0	0
					Clear	Refresh

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.



3 Configuring Port Mirror

The configuration page varies among different devices. Choose a procedure according to your actual web interface.

For certain devices:

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

Figure 3-1 Configuring I	Port Mirror		
Port Mirror			
Port Mirror Status:	Enable 🔻	Mirroring Port:	1 💌
Mirrored Port			
Mirrored Mode:	Both 💌		
Mirrored Ports:	1 2 3 4 5		Apply

Follow these steps to configure port mirror:

 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 certain devices:

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

Figure 3-2 Configuring Port Mirror

ort Mirror Status: En:	able Mirroring	Port: 1
Mirrored Port		
Mirrored Port	Ingress	Egress
port 1	Disable 💌	Disable 💌
port 2	Disable 💌	Disable 💌
port 3	Disable 💌	Disable 💌
port 4	Disable 💌	Disable 💌
port 5	Disable 💌	Disable 💌
port 6	Disable 💌	Disable 💌
port 7	Disable 💌	Disable 💌
port 8	Disable 💌	Disable 💌
port 9	Disable 💌	Disable 🔻
port 8	Disable 💌	Disable 💌

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
i igui c + i	resting the ouble

Cable Test			
Port	Test Result	Cable Fault Distance(m)	Test
port 1			Test
port 2			Test
port 3			Test
port 4			Test
port 5			Test
port 6			Test
port 7			Test
port 8			Test
port 9			Test
port 10			Test
port 11			Test
			Test All

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 connection status of cables. 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 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 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.

5 Configuring Loop Prevention

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

Figure 5-1 Configuring Loop Prevention

Loop Prevention S	etting	
Loop Prevention Status:	Enable 🔻	Apply

Follow these steps to configure loop prevention:

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

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

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

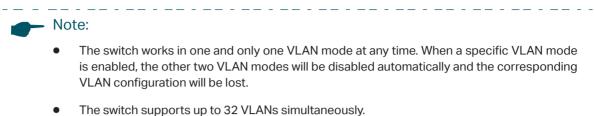
The IEEE 802.1Q protocol defines a new format of VLAN data frame (Tagged Frame). As the following figure shows, compared to the traditional Ethernet data frame (Untagged Frame), the VLAN data frame (Tagged Frame) adds a VLAN tag.

Figure 1-1 Untagged and Tagged Data Frame

Traditional Ethernet data frame (Untagged Frame)								
Destination Address	Source Address							
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.



2 Configuring MTU VLAN

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

Figure 2-1 Configuring MTU VLAN

MTU VLAN Setting			
MTU VLAN Status:	Enable	•	
Uplink Port:	1 💌		Apply

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

MTU VLAN		
MTU VLAN will be enabled, 802.1Q VLAN and Port Based VLAN will be disabled automatically and their settings will be lost.		
Are you sure to apply?		
Yes No		

3 Configuring Port Based VLAN

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

Figure 3-1 Configuring Port Based VLAN

Global Config]		
Port Based VLAN S	tatus: Enable 🔻	Ap	ply
Port Based V	LAN Setting		
VLAN:	2 💌		
Ports:			
2 4 6 8	10 12 14 16	Ar	ply
1357	3 11 13 15	. +	P.1
VLAN	Po	rt List	Delete VLAN
1	1	I- 1 6	

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	Enable or disable the port based VLAN mode.
VLAN Status	

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**.

AN Status		Apply
	-	
9 659 659 6	1 💌	
9 629 629 6		
8 10	12 14 16	Apply
		Apply
I	Port List	Delete VLAN
	3-16	
	1-2	Delete
	5 77 797 F	3-16

Figure 3-3 Verifying the Configuration Result

• 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

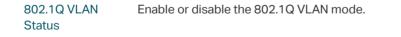
Choose the menu VLAN > 802.1Q VLAN to load the following page.

Figure 4-1 Configuring 802.1Q VLAN

Global Config						
802.1Q VLAN Status:	Enable 💌		App	ply		
802.1Q VLAN Setting						
VLAN (1-4094):	2					
VLAN Name:	VLAN2					
Tagged Ports:	Tagged Ports:					
246810	12 14 16					
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
Untagged Ports:						
2 4 6 8 10 12 14 16 Apply						
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
VLAN VLAN Name	Member Ports	Tagged Ports	Untagged Ports	Delete VLAN		
1 Default	1-16		1-16			

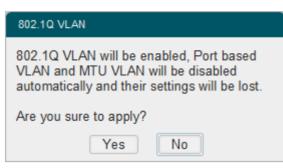
Follow these steps to configure the VLAN:

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



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**.

Global Config						
802.1Q VLAN Status:	Enable v		App	ply		
802.1Q VLAN Setting						
VLAN (1-4094):	2					
VLAN Name:	VLAN2					
Tagged Ports:						
246810	12 14 16					
13579	11 13 15					
Untagged Ports:						
2 4 6 8 10	12 14 16		App	ply		
13579	TT T3 T5					
VLAN VLAN Nam	e Member Ports	Tagged Ports	Untagged Ports	Delete VLAN		
1 Default	1-16		1-16			
2 VLAN2	1-3	1-2	3	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

Select	Port	PVID	
	port 1	1	
	port 2	1	
	port 3	1	
	port 4	1	
	port 5	1	
	port 6	1	
	port 7	1	
	port 8	1	

Follow these steps to configure the PVID:

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

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

2) Click **Apply**.

PVID

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

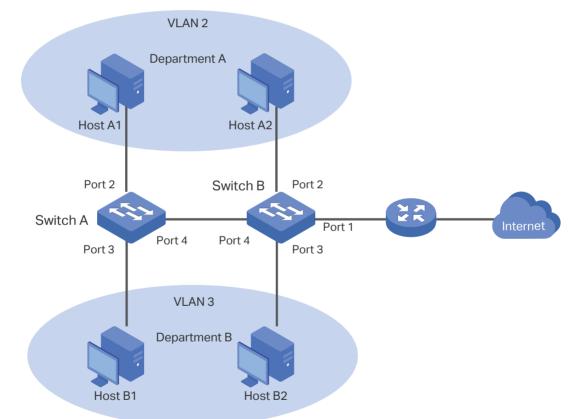
5.1 Network Requirements

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.

It's required that:

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





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 5-1Relationships 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	Set	Settings of Egress Rule and PVID on Switch A and Switch B				
Switch		Port	Egress Rule	PVID		
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 TL-SG1016PE, the following section provides configuration steps. The configuration steps on both switches are similar, here we take Switch A for example.

 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 80	02.1Q VLAN	
Global Config		
802.1Q VLAN Status:	Enable 🔻	Apply

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

Figure 5-3 Enableing 802.1Q VLAN

802.1Q VLAN
802.1Q VLAN will be enabled, Port based VLAN and MTU VLAN will be disabled automatically and their settings will be lost.
Are you sure to apply?
Yes No

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 **2**. 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

Global Config		
802.1Q VLAN Status:	Enable 🔻	Apply
802.1Q VLAN Setti	ing	
VLAN (1-4094):	2	
VLAN Name:	2	
Tagged Ports:		
2 4 6 8 10 1	12 14 16	
TT TT TT TT TT TT	11 13 15	
Untagged Ports:		
2 4 6 8 10 12 14 16 Apply		
13579	11 13 15	

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

Global Config		
802.1Q VLAN Status:	Enable <	Apply
802.1Q VLAN Sett	ing	
VLAN (1-4094):	3	
VLAN Name:	3	
Tagged Ports:		
2 6 8 10	12 14 16	
TT TS TS T7 T9 [<u>11</u> <u>13</u> <u>15</u>	
Untagged Ports:		
	12 14 16	Apply
TT TT TT TT TT TT	<u>11</u> <u>13</u> <u>15</u>	

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.

802.1Q	PVID Setting	
Select	Port	PVID
	3	3
	port 1	1
	port 2	2
\checkmark	port 3	3
	port 4	1
	port 5	1
	port 6	1
	port 7	1
	port 8	1
		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

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.

Global	Config		
QoS Mode:	Port Based	- Apply	/
Port Ba	ased Priority Setting		
Select	port	Priority Queue	LAG
		▼	
	port 1	1(Lowest)	
	port 2	1(Lowest)	
	port 3	1(Lowest)	
	port 4	1(Lowest)	
	port 5	1(Lowest)	
	port 6	1(Lowest)	👻
		Apply	/

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.

Figure 2-1 Configuring Basic QoS in Port Based Mode

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

	Global Config			
QoS	Mode:	802.1P Based	•	Apply
	Port Based Priority	Setting		
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

	Global Con	fig		
	QoS Mode:		DSCP/802.1P Based 💌	Apply
	Port Based	Priority	Setting	
Foll	low these steps	to confi	gure QoS in DSCP/802.1P based mode:	
1)	Select QoS mod	le as DS	SCP/802.1P Based.	
	QoS Mode	Select	the QoS mode.	
		levels = 32-4 basec VLAN	/802.1P Based : In this mode, the IP packets are m based on the DSCP value (Lowest= 0-15; Norma 47; Highest = 48-63). The switch prioritizes pack I on DSCP priority first. Then, the switch priorit tag but without IP header based on the PRI field. izes packets without VLAN tag or IP header based	al = 16-31; Medium tets with IP header tizes packets with Finally, the switch
2)	Click Apply .			

3 Configuring Bandwidth Control

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

Figure 3-1 Configuring Bandwidth Control

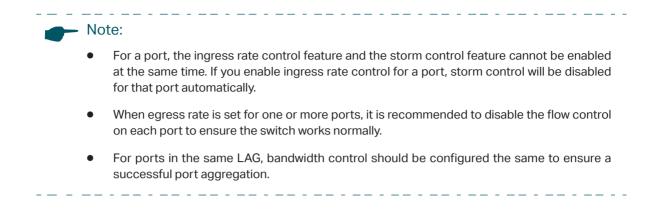
Bandy	width Control			
Select	Port	Ingress Rate(Kbps)	Egress Rate(Kbps)	LAG
		💌	💌	
	port 1	Unlimited	Unlimited	
	port 2	Unlimited	Unlimited	
	port 3	Unlimited	Unlimited	
	port 4	Unlimited	Unlimited	
	port 5	Unlimited	Unlimited	
	port 6	Unlimited	Unlimited	
	port 7	Unlimited	Unlimited	
	port 8	Unlimited	Unlimited	
	port 9	Unlimited	Unlimited	
	port 10	Unlimited	Unlimited	
	port 11	Unlimited	Unlimited	
			Apply	

Follow these steps to configure bandwidth control:

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

LAG	Displays the LAG which the port belongs to.
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.
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.

2) Click Apply.



4 Configuring Storm Control

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

Figure 4-1 Configuring Storm Control

Sto	orm Contro	ol Config				
Select	Port	Bc Limit	Mc Limit	UL Limit	Rate(Kbps)	LAG
		🔻	🔻	🔻	💌	
	port 1	Disable	Disable	Disable	Unlimited	
	port 2	Disable	Disable	Disable	Unlimited	
	port 3	Disable	Disable	Disable	Unlimited	
	port 4	Disable	Disable	Disable	Unlimited	
	port 5	Disable	Disable	Disable	Unlimited	
	port 6	Disable	Disable	Disable	Unlimited	
	port 7	Disable	Disable	Disable	Unlimited	
	port 8	Disable	Disable	Disable	Unlimited	
	port 9	Disable	Disable	Disable	Unlimited	
	port 10	Disable	Disable	Disable	Unlimited	
	port 11	Disable	Disable	Disable	Unlimited	
					Apply	×

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.

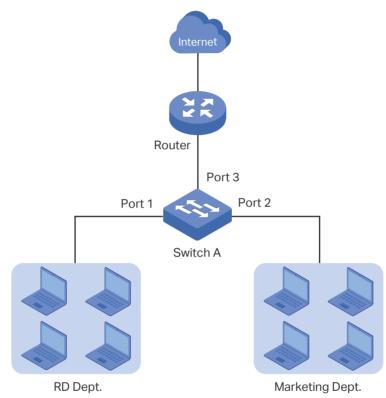
N	ote:
•	For a port, the storm control feature and the ingress rate control feature cannot be enabled at the same time. If you enable storm control for a port, ingress rate control will be disabled for that port automatically.
•	For ports in the same LAG, storm control should be configured the same to 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**.

QoSN	Global Config Node: Port Based Prio	Port Based	App	ly
Se	lect	port	Priority Queue	LAG
			🔻	
		port 1	1(Lowest)	A
		port 2	1(Lowest)	
		port 3	1(Lowest)	
		port 4	1(Lowest)	
		port 5	1(Lowest)	
		port 6	1(Lowest)	🚽
			Арр	ly

Figure 5-2 Configuring Basic QoS in Port Based Mode

 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.

Global	Config		
QoS Mode:	Port Based	 Apply 	/
Port Ba	ased Priority Setting		
Select	port	Priority Queue	LAG
		4(Highest) 💌	
	port 1	1(Lowest)	🍝
1	port 2	4(Highest)	
	port 3	1(Lowest)	
	port 4	1(Lowest)	
	port 5	1(Lowest)	
	port 6	1(Lowest)	🗸
		Apply	/

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

Part 7

Configuring PoE

(Only for Certain Devices)

CHAPTERS

- 1. PoE
- 2. Configuring PoE
- 3. Configuring PoE Auto Recovery
- 4. Configuring Extend Mode
- 5. Appendix: Default Parameters

1 PoE

1.1 Overview

- Note:

- The PoE feature is only available on certain devices. To check whether your device supports this feature, refer to the datasheet.
- PoE configuration is only available on certain devices. To check whether your device supports this feature, refer to the actual web interface.

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.

1.2 Supported Features

ΡοΕ

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.

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

System Power Limit: 150.0			w(1.0-150	w(1.0-150.0) Apply						
System Power Consumption: 0.0		w	W							
System Power Remain: 15		150.0	w	w						
Po	rt Config									
Select	Port	PoE Status	PoE Priority	Power Limit (0.1w-30.0w)	Power(w)	Current(mA)	Voltage(v)	PD Class	Power Status	
		🔻	🔻	🔻						
	port 1	Enable	Low	Class 4					OFF	
	port 2	Enable	Low	Class 4					OFF	
	port 3	Enable	Low	Class 4					OFF	
	port 4	Enable	Low	Class 4					OFF	
	port 5	Enable	Low	Class 4					OFF	
	port 6	Enable	Low	Class 4					OFF	
_	port 7	Disable	Low	Class 4					OFF	
		Enable	Low	Class 4					OFF	

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 ports. A 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.

3 Configuring PoE Auto Recovery

With PoE Auto Recovery enabled, the switch detects the link status between the ports and connected PDs. The switch pings the IP addresses of PDs constantly. If a PD loses connection, the switch will reboot it automatically.

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

PoE A	uto Reco	very: 🔘 Enabl	e 💿 Disable		Apply					
Por	t Config									
Auto I	Refresh									
Select	Port	Ping IP Address	Startup Delay (Seconds)	Interval (Seconds)	Failure Threshold	Break Time (Seconds)	Failures	Reboots	Total Pings	Status
	port 1		30	60	5	15	0	0	0	Disable
	port 2		30	60	5	15	0	0	0	Disable
	port 3		60	60	5	15	0	0	0	Disable
	port 4		60	60	5	15	0	0	0	Disable
	port 5		60	60	5	15	0	0	0	Disable
	port 6		60	60	5	15	0	0	0	Disable
	port 7		60	60	5	15	0	0	0	Disable
	port 8		30	60	5	15	0	0	0	Disable

Figure 3-1 Configuring PoE

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.

Note:

- Before upgrading the connected PoE powered device (PD), disable PoE Auto Recovery on the corresponding port to avoid PD's damage.
- 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). For detailed configurations, refer to *Configuring 802.1Q VLAN*.

__ _ _ _ _ _ _

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

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.
Interval	Specify the interval between two consecutive ping packets.
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, then the switch reboots the PD.
Break Time	Specify how soon the switch reboots the PD after the number of ping failures reaches the threshold.
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.

4 Configuring Extend Mode

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

Figure 4-1 Configuring Extend Mode

Select	Port	Extend Mode
		T
	port 1	Disable
	port 2	Disable
	port 3	Disable
	port 4	Disable
	port 5	Disable
	port 6	Disable
	port 7	Disable
	port 8	Disable

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 dropdown list to enable or disable **Extend Mode**.

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

2) Click **Apply**.

5 Appendix: Default Parameters

Default settings of PoE Config are listed in the following table.

Table 5-1 Default Settings of PoE Config

Parameter	Default Setting
Global Config	
System Power Limit	150.0 W
Port Config	
PoE Status	Enabled
Startup Delay	Low
Interval	Class 4

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

Table 5-2Default Settings of PoE Auto Recovery

Parameter	Default Setting
Global Config	
PoE Auto Recovery	Disabled
Port Config	
Ping IP Address	None
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 5-3Default Settings of Extend Mode

Parameter	Default Setting
Extend Mode	Disabled

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

	Online Help	
0	nline 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.

Note:	
Supported switch models vary among different software versions supports, refer to the actual web interface.	. To check which models the utilit
ure 3-1 Viewing Information About the Utility	
About the utility	Â
The Easy Smart Configuration Utility supports the following TP-Link switch models:	
• TL-SG105E 1.0/2.0/3.0/4.0/5.0	
• TL-SG108E 1.0/2.0/3.0/4.0/5.0/6.0	
• TL-SG105PE 1.0/2.0	
• TL-SG108PE 1.0/2.0/3.0/4.0/4.20/5.0	
• TL-RP108GE 1.0	
• TL-SG116E 1.0/1.20/2.0/2.20	
• TL-SG1016PE 1.0/2.0/3.0/3.20/4.0/5.0/5.20/6.0	
•TL-SG1016DE 1.0/2.0/3.0/4.0/4.20/6.0/7.0	
• TL-SG1024DE 1.0/2.0/3.0/4.0/4.20/6.0/7.0	
• TL-SG1210MPE 2.0/3.0	
• TL-SG1218MPE 1.0/2.0/3.20/4.0/4.20/5.0	
• TL-SG1428PE 1.0/1.20/2.0/2.20/3.0	
• TL-SG605E 5.0	