LinkPower™ PL3 Series

Web Management User's Manual

August 2017

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Revision History

Version	Date	Modification
V2.0	2015.8	First Version
V2.1	2017.08	1，Content & Header 2，Product Introduction And Feature 3，Layer 3 Static Routing And Ipv6 Configuration 4，Change SNTP to NTP. Add NTP Setting. 5，SNMPv3 Configuration 6，PoE Scheduling Configuration 7，MSTP Configuration 8，IPMC Profile Configuration 9，IPV6 MLD Snooping Configuration 10，Appendix 1 Term List & Appendix 2 FAQ

Certification

Inscape Data Corporation certifies that this product met its published specifications at time of shipment from the factory.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Industry Canada Statement

This Class A digital apparatus complies with Canadian ICES-003.

CE Statement

This product complies with the European Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC as amended by European Directive 93/68/EEC.

Warning: This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Safety Summary

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comply with these requirements.

Before Applying Power

Verify that the product is set to match the available line voltage and all safety precautions are taken.

Over Temperature Warning

To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of (70°C). To prevent product cooling restriction, allow at least 3 inches (7.6 cm) of clearance around the product after installation.

Ground the Instrument

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument must be connected to the ac power supply mains through a three-conductor power cable, with the third wire firmly connected to an electrical ground (safety ground) at the power outlet. For instruments designed to be hard-wired to the ac power lines (supply mains), connect the protective earth terminal to a protective conductor before any other connection is made. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

When installing the unit, always make the ground connection first and disconnect it last.

Jewelry Removal Warning

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Do not Operate in Explosive Atmosphere

Do not operate the product in the presence of flammable gases or fumes.

Chassis Power Connection

Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the device. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the device, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Work During Lightning Activity

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Comply with Local and National Electrical Codes

Installation of the equipment must comply with local and national electrical codes

Do Not Exceed Input and Output Ratings

Do not operate the product to exceed the power input and output ratings.

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1. Introduction

1.1 Product Introduction

LinkPower™ PL3 Series is a high-end cost-effective smart rack style core L3 switch. The series includes LinkPower™ PL3-240084 and LinkPower PL3-480004. The LinkPower PL3-240084 provides 36 10/100/1000Base-T(X) PoE ports, 8 gigabit fiber ports, and 4 10G SFP+ fiber ports. The LinkPower™ PL3-480004 provides 48 10/100/1000Base-T(X) PoE ports and 4 10G SFP+ fiber ports. The increase of switching capacity enhances the data communication function, and the series is suitable for the large-scale network.

The LinkPower™ PL3 series supports IPv4 / IPv6 double stack platform. The series supports a variety of advanced management functions, such as PoE Management, MAC Table, VLANs, Port Isolation, Loop Protection, IGMP Snooping, MLD Snooping, ERPS, DHCP client, DHCP Snooping, STP/RSTP/MSTP, 802.1 x, QoS, port mirror, LLDP, static routing and NTP etc, 128 static routing, and basic QINQ, to provide users with the perfect solution; At the same Time the series supports SNMP v1 / v2, v3 (Simple Network Management Protocol), CLI command line, Web net tube, TELNET mode of Management, make equipment Management more convenient, at the same Time, with the ACL control function, attack prevention function, make the Management more secure.

The series complies with FCC and CE standards and supports one channel AC power input. Using the mute fan can adapt to the work environment temperature range of -10 ℃ to 50 ℃. Also, it can satisfy the requirements of the various site and provide reliable, economical solutions.

1.2 Feature

- IEEE802.3, IEEE802.3u, IEEE802.3ab, IEEE802.3z, IEEE802.3ae
- LinkPower PL3036PFM: 24 * 10/100/1000Base-T(X) PoE ports + 8 * gigabit fiber ports + 4 * 10G SFP+ fiber ports

  LinkPower PL3028PFM: 24 * 10/100/1000Base-T(X) PoE ports + 4 * 10G SFP+ fiber ports

  LinkPower PL3048PFM: 48 * 10/100/1000Base-T(X) PoE ports + 4 * 10G SFP+ fiber ports
- Support V-Ring looped redundancy technology. Self-healing time for a looped network is less than 20 ms
- Support PoE management, POE load timing restart, and on-off.
- Support IGMP Snooping, Static multicast filtering, MLD Snooping filtering
- Support DHCP Snooping, protect from ARP attack, attack of illegal DHCP server access
- Support NTP, easy for real-time synchronization of network time
- Support SNMP v1/v2/v3
- Support LLDP
- Support ACL, enhance the flexibility and safety of network management
- Support QoS, enhance the stability of the network

- Support port mirror, convenient for online debugging
- Support cable testing, convenient for the examining cable length in a project
- Support STP/RSTP/MSTP, enhance the stability of network
- Support IEEE802.1Q VLAN, IEEE802.1ad QINQ
- Support 802.1x authentication to port and MAC
- Support static routing L3 switching technology
- Operation temperature range: -10℃～50℃
- Storage temperature range: -40℃～85℃
- Support silent fan, rack installation

1.3 Overview

Thank you for purchasing our managed switch series, whose all software functions can be managed, configured, and monitored via embedded Web-based(HTML) interface. By a standard browser, you can manage switch at any remote site in the network. A browser as a universal access tool uses the HTTP protocol to communicate with a switch directly.

1.4 Web Management Login

Open installed web browser on your PC, input the switch's IP address like http://xxx.xxx.xxx.xxx, then open that URL to login web management.

Note: IP address of the switch is 192.168.2.1 by default. So please input http://192.168.2.1 in the browser.

When the login window appears, please enter the default username "admin" with password "system" . Then click OK to login.

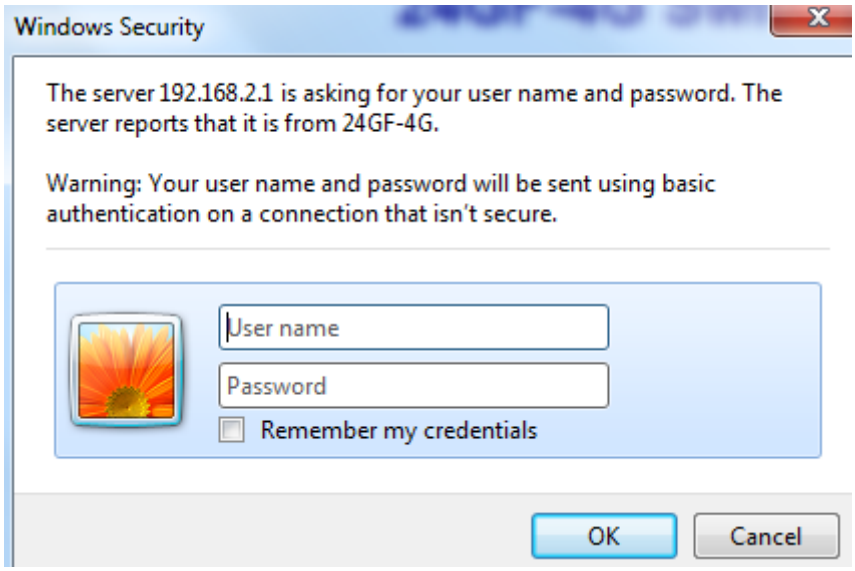


Figure1-1Login Window

Default User Name:admin
Default Password: system

1.5 Web-based User Interface

After entering the username and password, the main screen appears asfollowing Figure1-2.

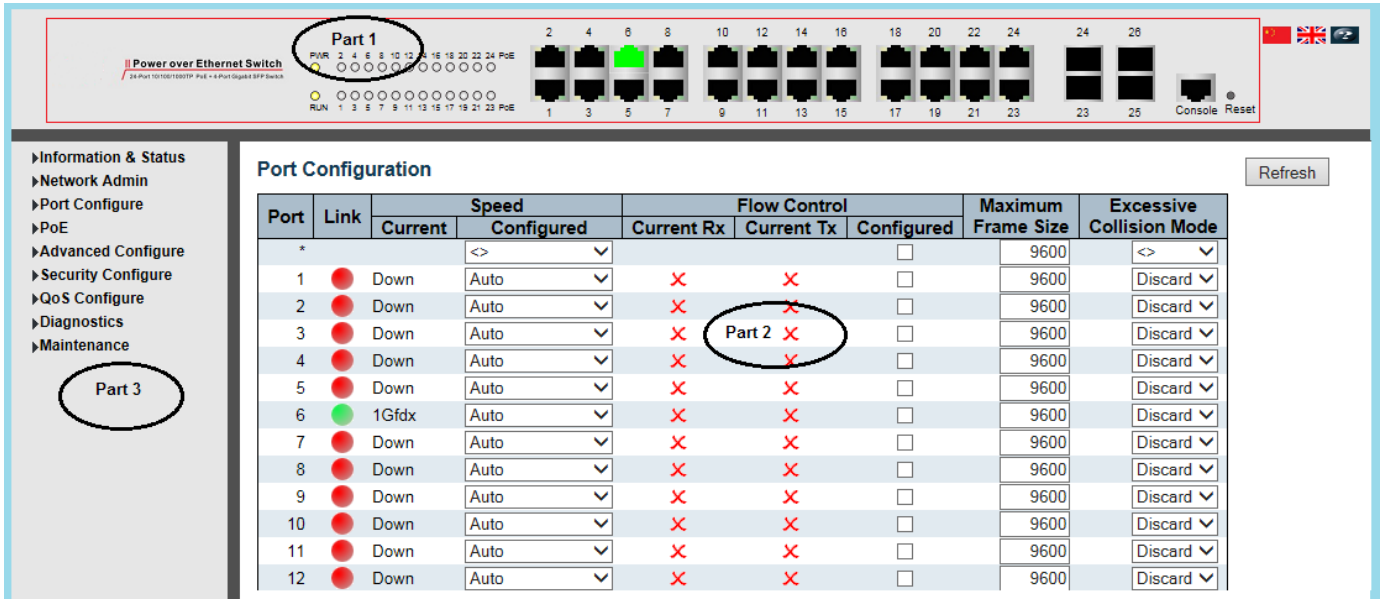


Figure1-2 Web management Main Page interface

This Main Page interface includes mainly 3 parts. Here is description:

Part	Description

Part 1	Company LOGO; Panel display; Port indicators, including PoE and Link working status; Language selection button; Help document
Part 2	The Main Menu, lets you access all the commands and statistics
Part 3	Main Screen, showing configuration details

The Web agent displays an image of the Managed Switch's ports. Different colors mean different states, they are illustrated as follows:

: 100Mbps linked ; : 1000Mbps linked ; : No link

1.6Main Menu

Using the on-board Web agent, you can define system parameters, manage and control the Managed Switch, and all its ports, or monitor network conditions. Via the Web-Management, the administrator can set up the Managed Switch by selecting the functions listed in the Main Menu. Following is a short description:

Information & Status - Users can check switch information and working status under this menu.
Network Admin - Users can check and configure related features of network under this menu.
Port Configure - Users can check and configure specification of ports under this menu.
PoE - Users can check and configure related features of Power-over-Ethernet (PoE) under this menu.
Advanced Configure - Users can check and configure L2 advanced features under this menu.
Security Configure - Users can check and configure security features of the switch under this menu.
QoS Configure - Users can check and configure QoS features of the switch under this menu.

2.Network Management

2.1 IP Configuration

Note: IP address of the switch is 192.168.2.1 by default, and the default subnet mask is255.255.255.0(24)

Click "Network Admin">"IP", screen will shows as:

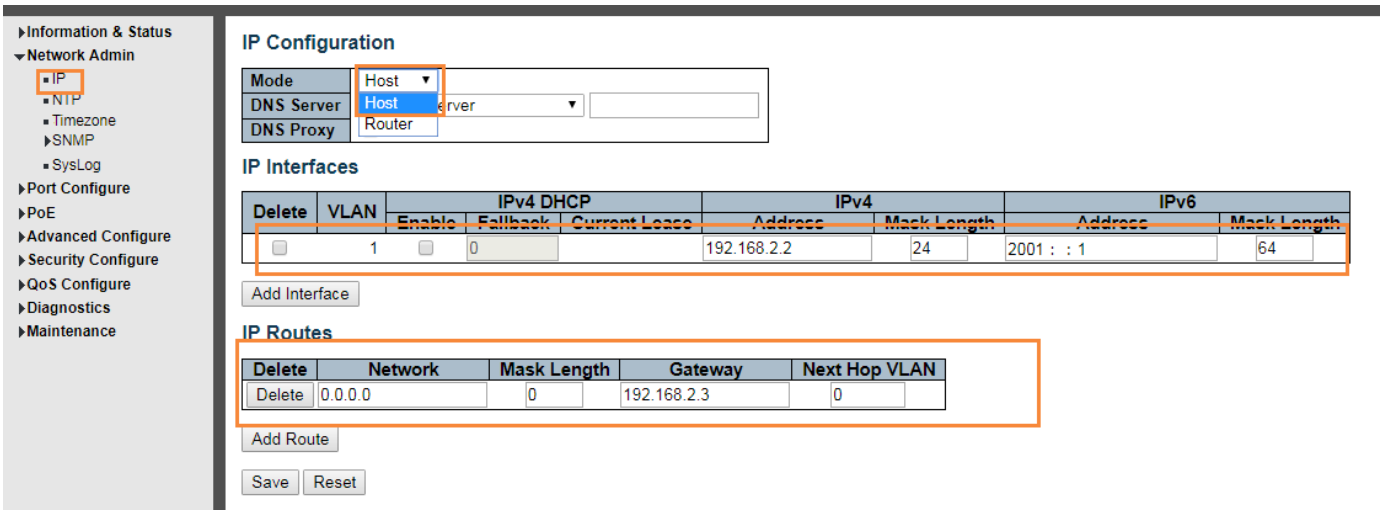


Figure 2-1IP Configuration Screen

Following is description detail about IP configuration:

Name	Description
Port Name	Display system's port name

VLAN	VLAN for for access and management of switch
IPv4 DHCP	- If enable, it means that VLAN port start IPv4 DHCP client, to dynamically get IPv4 addresses of the switch. Otherwise, it will use switch's static IP configuration. - Fallback(Seconds), means the waiting Time for switch to get dynamic IP address via DHCP. The value of "0" here means never over the Time. - Current Lease, means the IP address get from DHCP
IPv4	- Address: static IPv4 address entered by user. - Mask Length: static IPv4subnetmask entered by user.
IPv6	- IP Address, Users can input the static IPv6 address - IP Mask, Users can input the static IPv6 subnet mask
IP Routes	- Destination, Users can iput t he IPv4 address of destination - IP Mask, Users can static IPv4 subnet mask - Next address, Users can input next IPv4 address

Click "Add Interface"to create a new management for VLAN and IP address. Click "Save"to save settings.

Note: The switch only created VLAN1 by default. If the user needs to use other VLAN for switch management, please first add VLAN in the VLAN module, and add the relevant port to the VLAN.

2.2 NTP Configuration

NTP is an acronym for SimpleNetwork Time Protocol, a network protocol for synchronizing the clocks of computer systems. You can specify NTP Servers and set GMT Time zone. The NTP Configuration screens will appear after you click "Network Admin">"NTP".

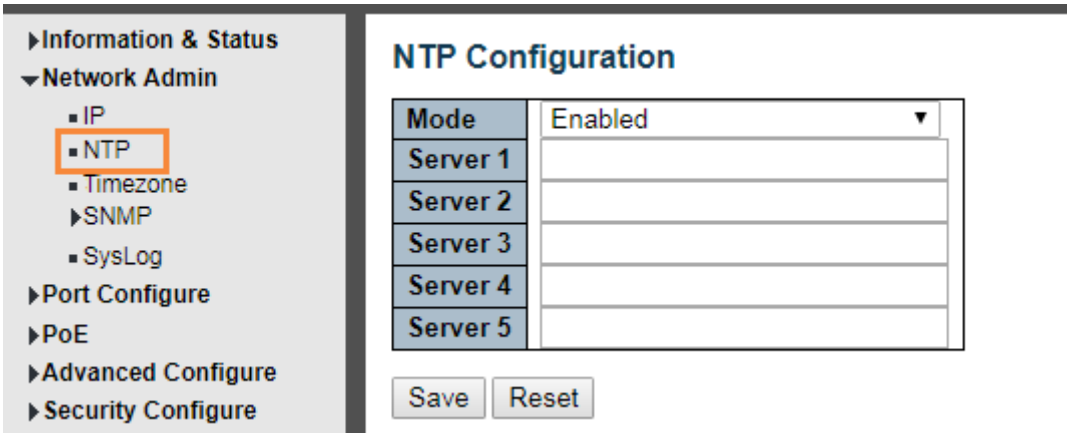


Figure 2-2 NTP Setting Screen

Configuration object and description is:

Object	Description

Mode	Click drop-down menu to select "Enabled" or "Disabled"NTP. Enabled: Enable NTP mode operation. When enabling NTP mode operation, the agent forwards and transfers NTP messages between the clients and the server when they are not on the same subnet domain. Disabled: Disable NTP mode operation.
NTP Sever	After input NTP server IP address, NTP information will be get from that server.

After configuration was set, please click "Save" to save the setting.

2.3Timezone

Timezone is to set the Time of the switch. Users can set the Time according to their locations. You can get into the timezone through "Network admin"> "Timezone," as below figure 2-3

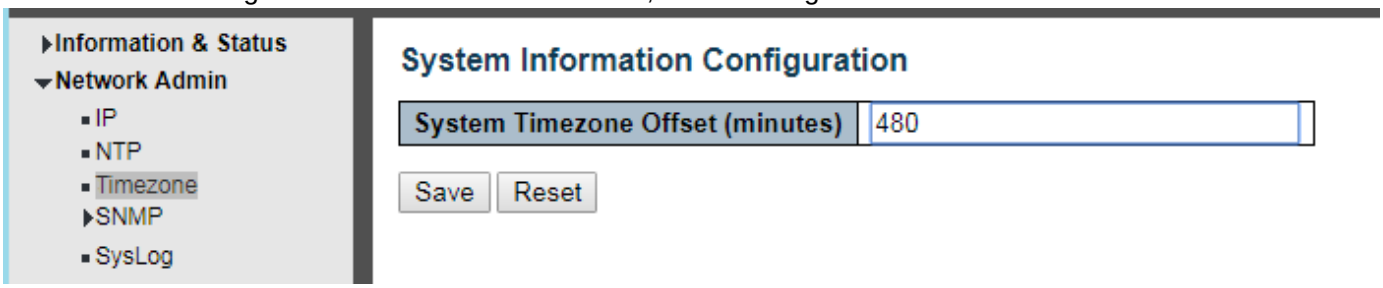


Figure 2-3 NTP Setting

Configuration instructions

Item	Instruction
Time zone setting	Input the Time

Click "save" to enable your settings.

2.3 SNMP Configuration

Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP)protocol suite. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth.

This switch supports SNMPv1, v2c,v3. Different versions of SNMP provides different security level for management stations and network devices.

In SNMP's v1 and v2c, it uses the "Community String" for user authentication. That string is similar to password function. SNMP application of remote user and SNMP of the Switch must use the same community string. SNMP packets of any unauthorized sites will be ignored (discarded).

"Community String" by default for switch's SNMPv1 and v2c access management is:

1. public – allow an authentication management station to read MIB objects.
2. private – allow an authentication management station to read, write and edit MIB objects.

Trap

Used by the agent to asynchronously inform the NMS of some event. These events may be very serious, such as reboot (someone accidentally turned off switch), or just general information, such as port status change.In these cases, the switch creates trap information and send then to receiver or network admin. Typical trap includes authentication failure, networking changes and cold/hot start trap.

MIB

A MIB is a collection of managed objects residing in a virtual information store. Collections of related managed objects are defined in specific MIB modules. Switch uses standard MIB-II information management module. So, MIB object value can be read by any SNMP web-managed software.

2.3.1 SNMP System Configuration

You can enable or disable the SNMP System Configuration. Its screen will appear after you click"Network Admin">"SNMP">"System"

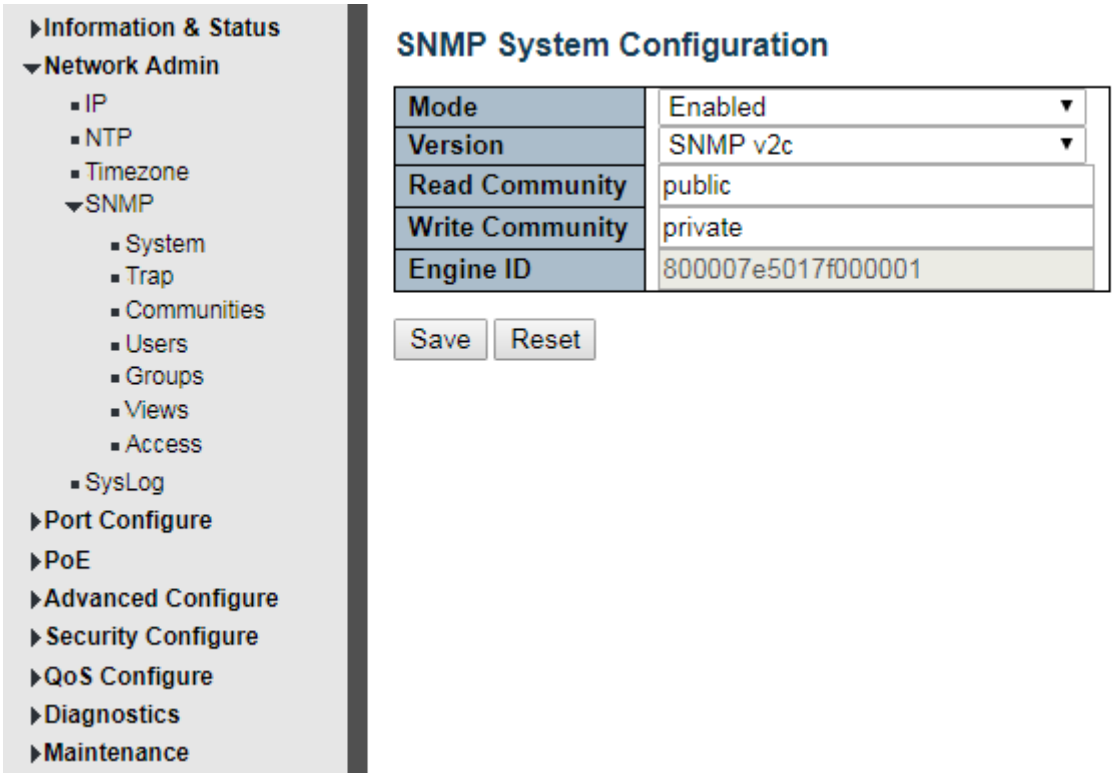


Figure 2-3-1 SNMP System Setting Screen

Configuration object and description is:

Object	Description
Mode	Enabled or DisableSNMP function
Version	Click drop-down menu to select SNMP v2c or SNMP v1 version
Read Community	Public: allow authentication management station to read MIB objects
Write Community	Private: allow authentication management station to read and write MIB objects.

2.3.2 SNMP Trap Configuration

User can enable or disable SNMP Trap function and set configuration. Click "Network Admin">"SNMP">"Trap" , then this screen will show as:

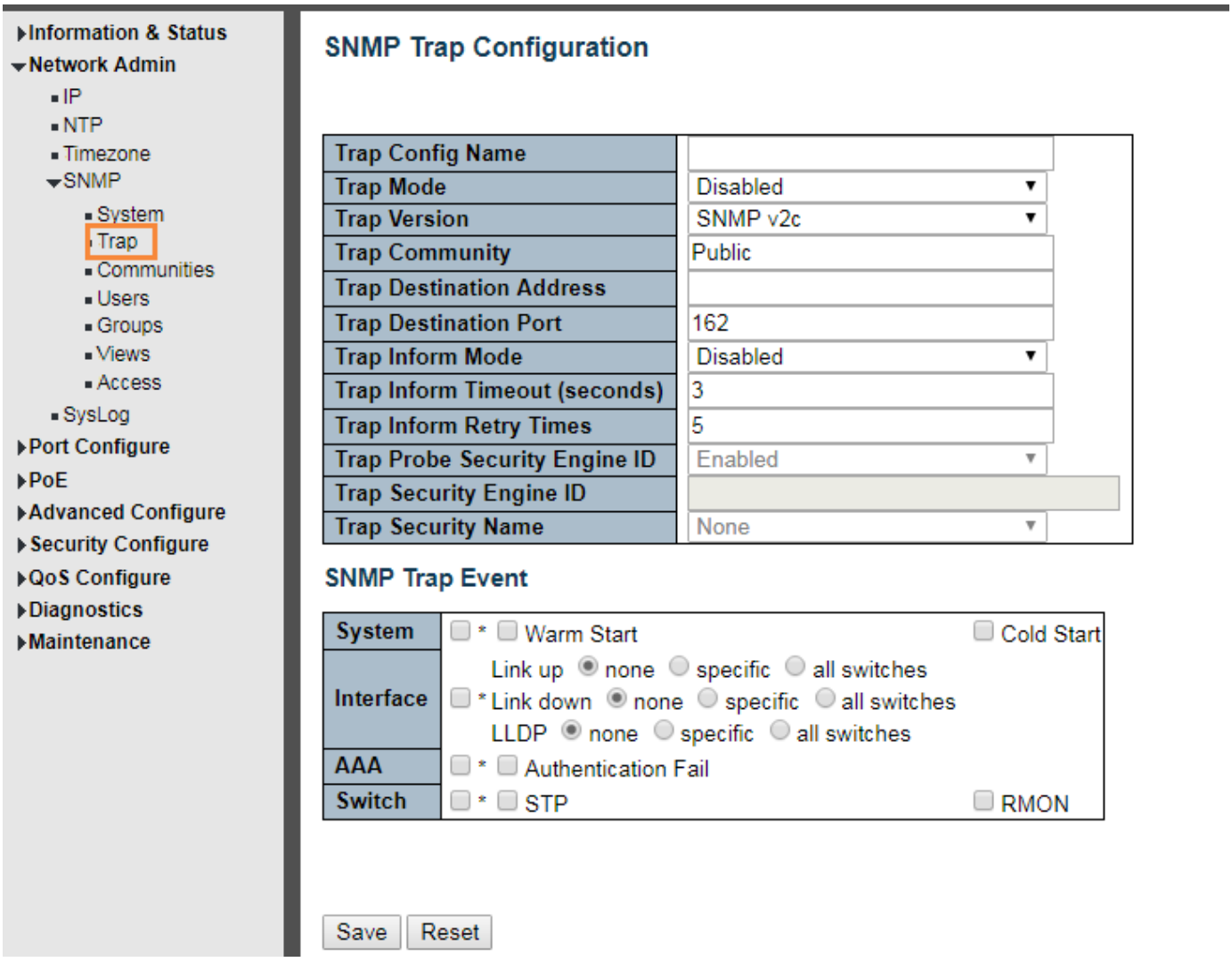


Figure 2-3-2

2.4.3 Communities

Users can set the new community name through "Network admin"> "SNMP"> "Communities", as below figure 2-4-3

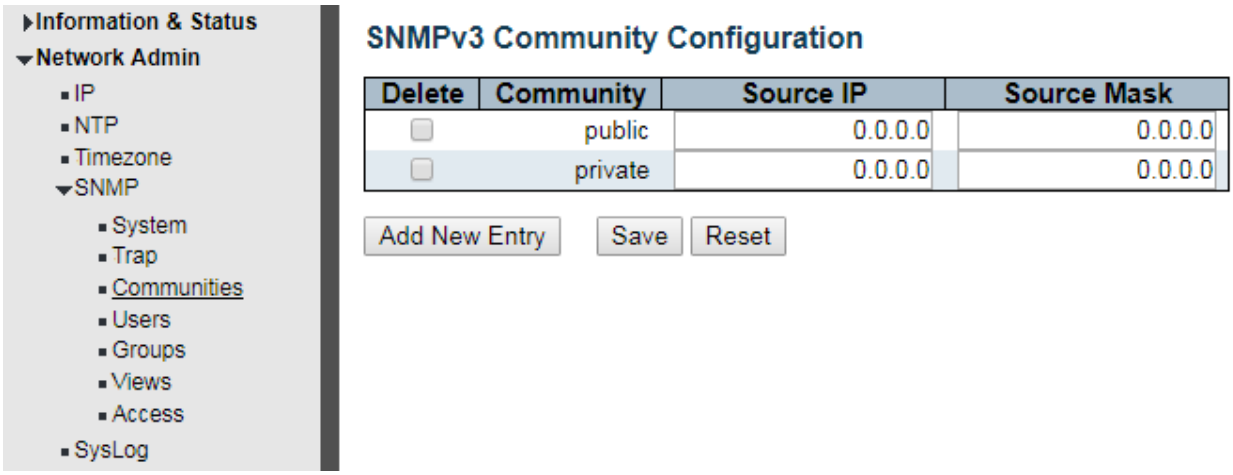


Figure 2-4-3 Adding Community

Configuration Instruction

Item	Instruction
Community	Input the name of the new community
Source IP	Input IPv4 source address
Source Mask	Input IPv4 subnet mask

Click "Save" to enable your settings.

2.4.4 Users

SNMP v3 is using USM (User-Based Security Model) authentication mechanism. The administrator can set authentication and Encryption function. The authentication is verify the validity of a message sender and to avoid illegal user access. Encryption is for encrypting the communication between NMS and Agents to be bugged. Adopting above two functions, it provides greater security for communication between NMS and Agent.

Users can set a SNMP v3 account and EncryMode. Click "Network Admin"> "SNMP"> "Users", as below :

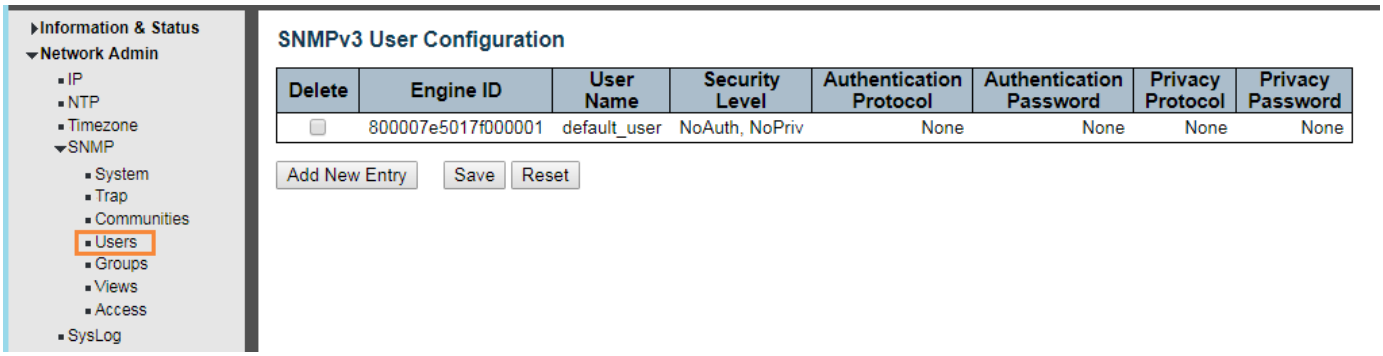


Figure 2-4-4 Adding Users

Configuration Instruction:

Object	Instruction
Engine ID	Default Value 800007e5017f000001. The switch default value is recommended
User Name	Input the new account name of SNMPv3
Security Level	Three EncryModes, NoAuth, NoPriv，Auth, NoPriv，Auth,Priv, choosing by dropping down the menu
Authentication Protocol	Choose for MD5 and SHA
Authentication Password	Input the encrypted password
Privacy Protocol	Choose for DES and AES
Privacy Password	Input the encrypted password

Click "Save" to enable your settings.

2.4.5 Views

Users can set the visit view of SNMPv3. Click “Network Admin” > “SNMP” > “View”. As below:

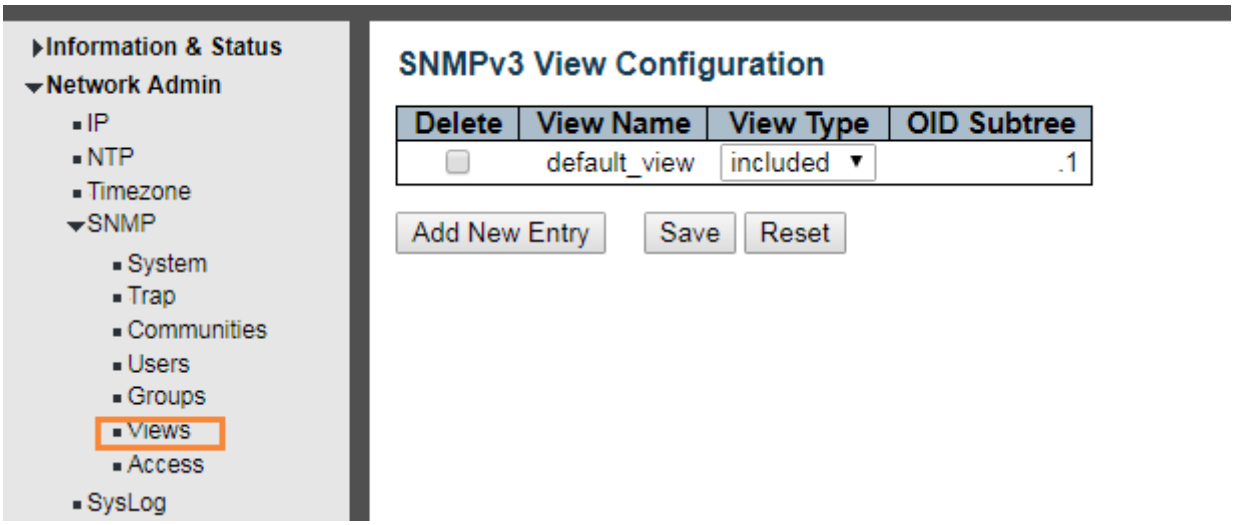


Figure 2-4-5 SNMPV3 Adding Views

Configuration Instruction

Object	Instruction
Views Name	Input the name of Views
Views Type	Choose for included and excluded
OID Subtree	Input OID subtree, such as 1.2

Click "Saving" to enable your settings.

2.4.6 Access

Uses can set an Access to load a built Views. Click "Network Admin"> "SNMP"> "Access", as below:

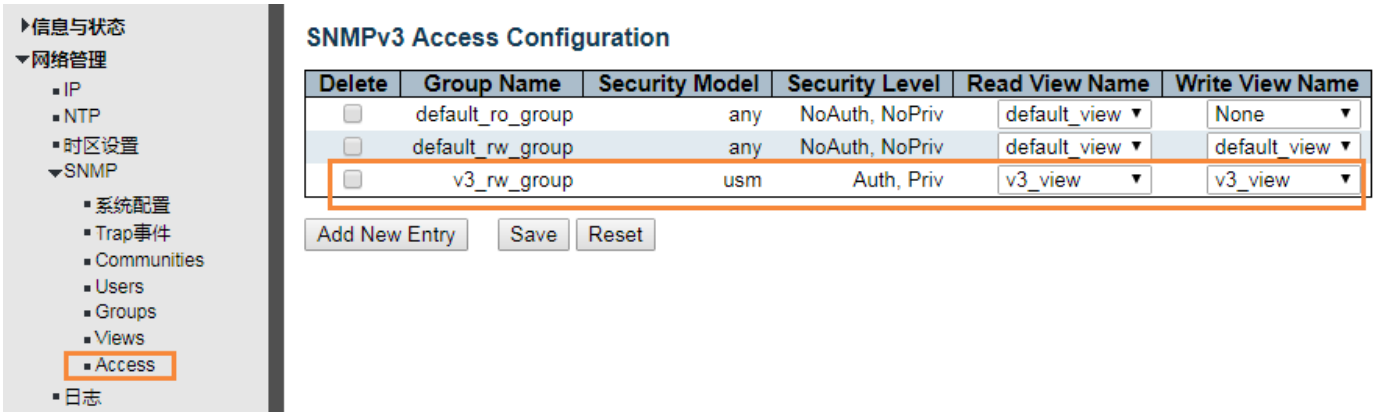


Figure 2-4-6 SNMPv3 Access Load Setting

Configuration Instruction

Object	Instruction
Group Name	Input the name of group
Security Model	Choose for any v1 v2c usm
Security Level	Three EncryModes, NoAuth, NoPriv，Auth, NoPriv，Auth,Priv, choosing by dropping down the menu
Read View Name	Chose the built views
Write View Name	Chose the built views

Click "Save" to enable your settings.

2.4.7 Groups

Users can set Groups to load built Users and Access. Click "Network Admin"> "SNMP"> "Groups", as below

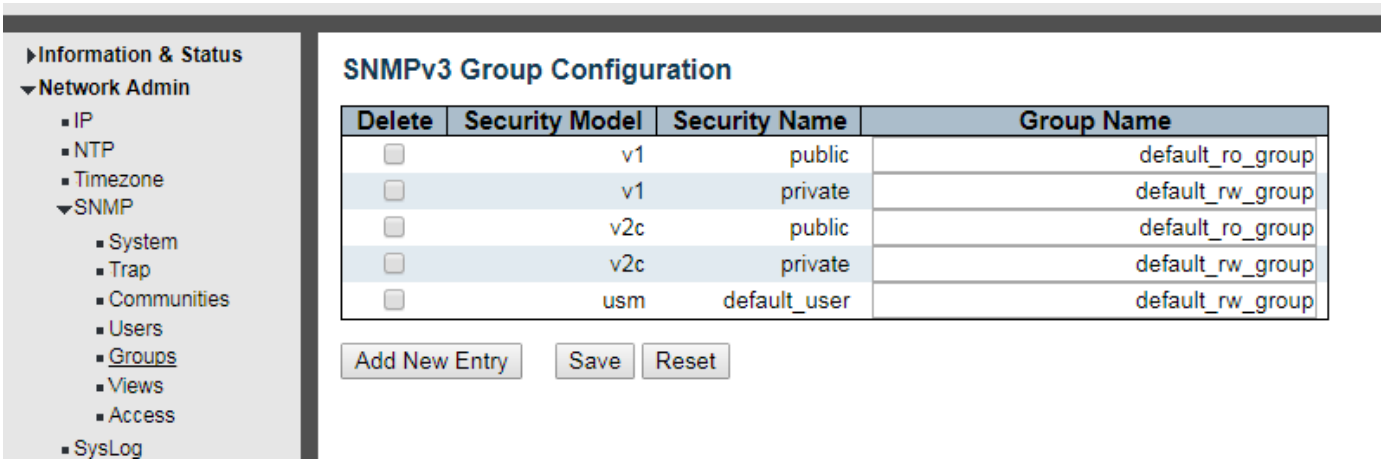


Figure 2-4-7 SNMPV3 Groups Load Setting

Configuration Instruction

Object	Instruction
Security Model	Choose for v1 v2c usm
Security Name	Choose the built account name. For built team name under v1 v2c, built account name under usm
Group Name	Input built group name

Click "Save" to enable settings.

2.4 System LogConfiguration

User can configure switch's system log, via following screen after click "Network Admin">"Syslog"

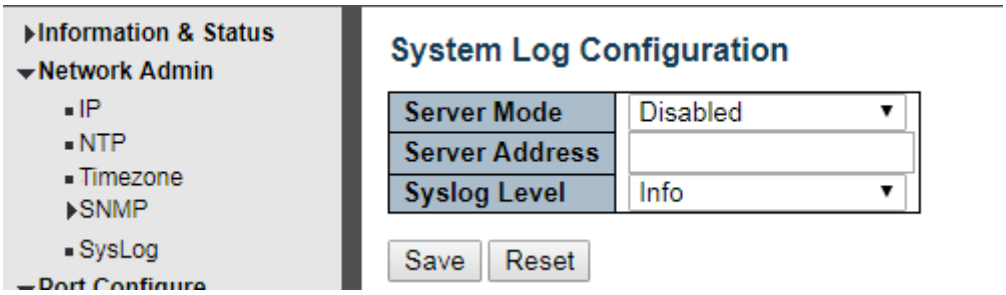


Figure2-4System Log Configuration Screen

Configuration object and description is:

Object	Description
Server Mode	Enabled or Disable SNMP System Log function. If "Enable"is selected, switch will send System Log to defined server.
Server Address	Defined server IP address
Syslog Level	To define level of System Log, including: **Info**: Information, warnings and errors. **Warning**: warnings and errors. **Error**: errors.

3.Port Configure

3.1 Port Configuration

This page is for configuring port specifications of switch. After click "Port Configure">"Ports", this screen will appear as:

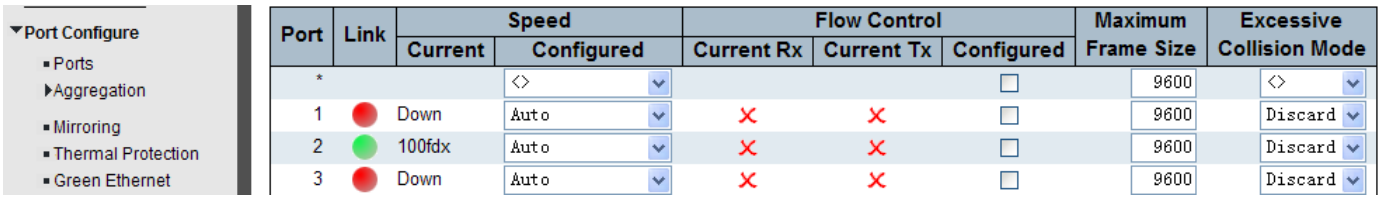


Figure 3-1Port Configure Screen

Configuration object and description is:

Object	Description
Link	Red color means Link Down, green color means Link Up
Speed	Select the port speed and full / half duplex mode. "Disabled" means that port is disabled. "Auto"meaning in full-duplex (FDX) or half-duplex mode (HDX) (1000mbps always in full-duplex mode) auto negotiateamong 10,100,1000Mbps devices. "Auto" setting allows the port to automatically determine the fastest settings for the device connected, and to apply these settings. "1000-X_AMS" means that port is Ethernet/Optical combo port, and optical port is prioritized. Other options are10M HDX, 10M FDX, 100M HDX, 100M FDX, 1000M FDX, 1000-X.
Flow Control	It is a flow control mechanism for a variety of port configurations. Full-duplex ports use 802.3x flow control, half-duplex ports use backpressure flow control. It is disabled by default. Check to enable flow control.
Maximum Frame Size	It is used to set the maximum frame size for Ethernet. The default setting is 9600, which is to support Jumbo frames.

Click "Save" to store and active settings.

3.2 Link Aggregation

Users can set up multiple links among multiple switches. Link Aggregation, is a method that tie some physical ports together as one logic port, to enlarge bandwidth. This switch supports up to 13 groups Link Aggregation, 2 to 8 port as one group.

Note: If any port in the link aggregation group is disconnected, data packet that sent to disconnected port will share load with other connected port in this aggregation group.

3.2.1 Static Aggregation

In this page, user can configure static aggregation of switch's ports. After click the menu "Port Configure">"Aggregation">"Static", followed window will appear for making static aggregation settings.

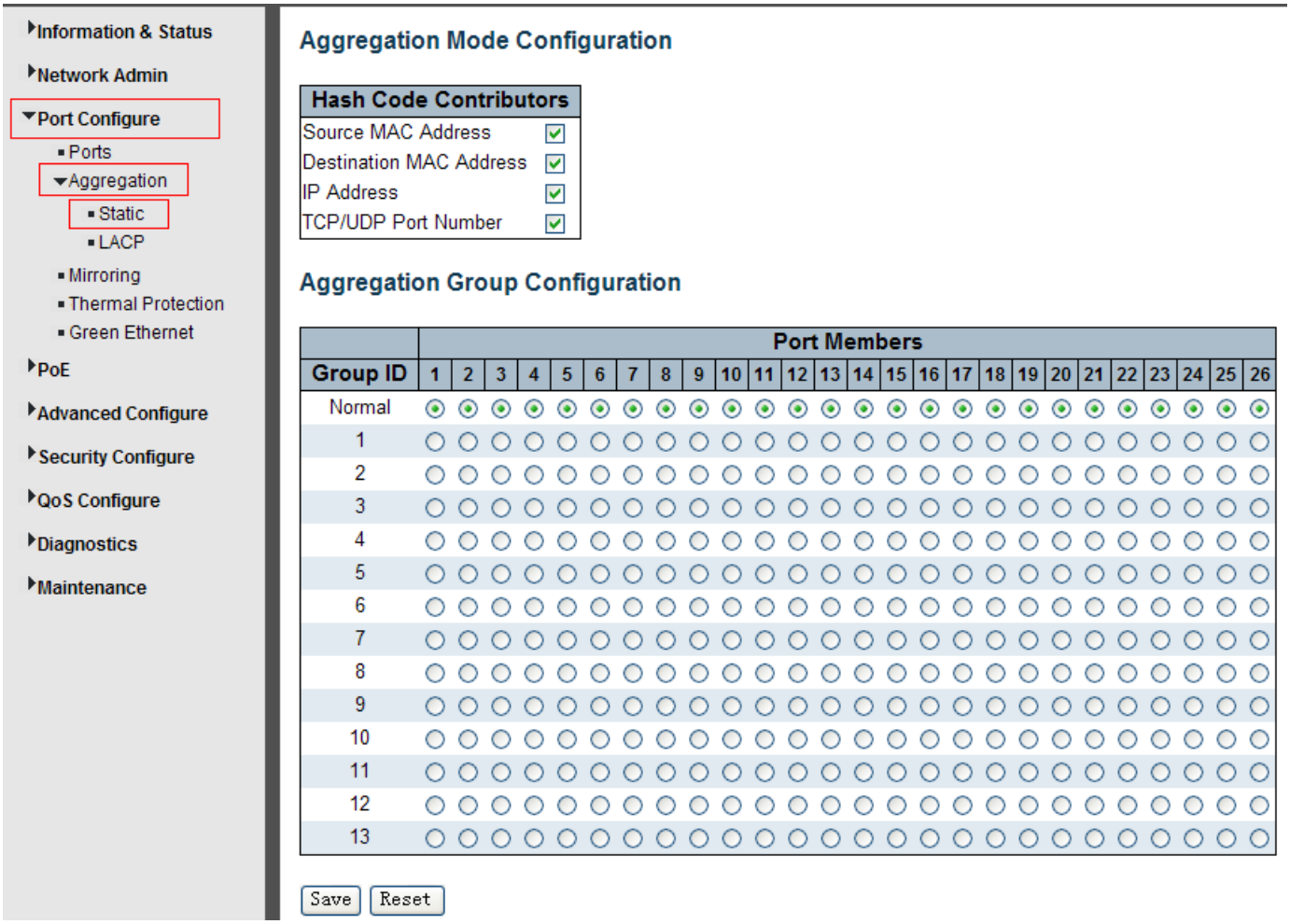


Figure 3-2Port Static Aggregation Configuration Screen

Configuration object and description is:

Object	Description
Aggregation Mode Configuration	This parameter is flow hash algorithm among LAG(Link Aggregated Group) ports.
Group ID	Static aggregation group ID
Port Members	This switch supportsup to 13 groups Link Aggregation, 2 to 8 port as one group.

Click "Save" to store and active settings.

Note: It allows a maximum of 8 ports to be aggregated as 1 static trunk group at the same Time.

3.2.2 LACPAggregation

Link Aggregation Control Protocol (LACP) provides a standardized means for exchanging information between Partner Systems that require high-speed redundant links. Link aggregation lets you group up to eight consecutive ports into a single dedicated connection. This feature can expand bandwidth to a device on the network. LACP operation requires full-duplex mode. For more detailed information, refer to the IEEE 802.3ad standard.

Users can create dynamic aggregation group for switches. After click "Port Configure">"Aggregation">"LACP", users can set LACP configuration in followed screen.

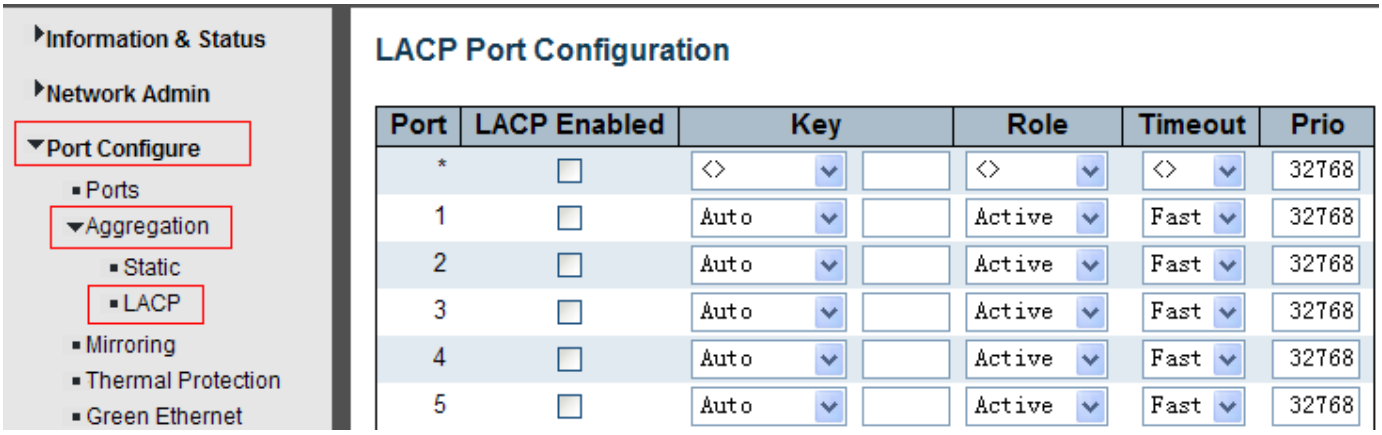


Figure 3-3 LACP Configuration Screen

Configuration object and description is:

Object	Description
LACP	Enable or disable LACP function of that port.
Key	The Key value incurred by the port, range 1-65535 . The Auto setting will set the key as appropriate by the physical link speed, 10Mb = 1, 100Mb = 2, 1Gb = 3. Using the Specific setting, a user-defined value can be entered. Ports with the same Key value can participate in the same aggregation group, while ports with different keys cannot.
Role	The Role shows the LACP activity status. The Active will transmit LACP packets each second, while Passive will wait for a LACP packet from a partner (speak if spoken to).
Timeout	The Timeout controls the period between BPDU transmissions. Fast will transmit LACP packets each second, while Slow will wait for 30 seconds before sending a LACP packet.
Prio	The Prio controls the priority of the port. If the LACP partner wants to form a larger group than is supported by this device then this parameter will control which ports will be active and which ports will be in a backup role. Lower number means greater priority.

Click "Save" to store and active settings.

3.3 Port Mirroring

Configure port Mirroring on this page. This function provides monitoring of network traffic that forwards a copy of each incoming or outgoing packet from one port of a network switch to another port where the packet can be studied. It enables the manager tokeep close track of switch performance and alter it if necessary.

To configure Mirror settings, please click "Port Configure">"Mirroring" . Then followed screen will appear as:

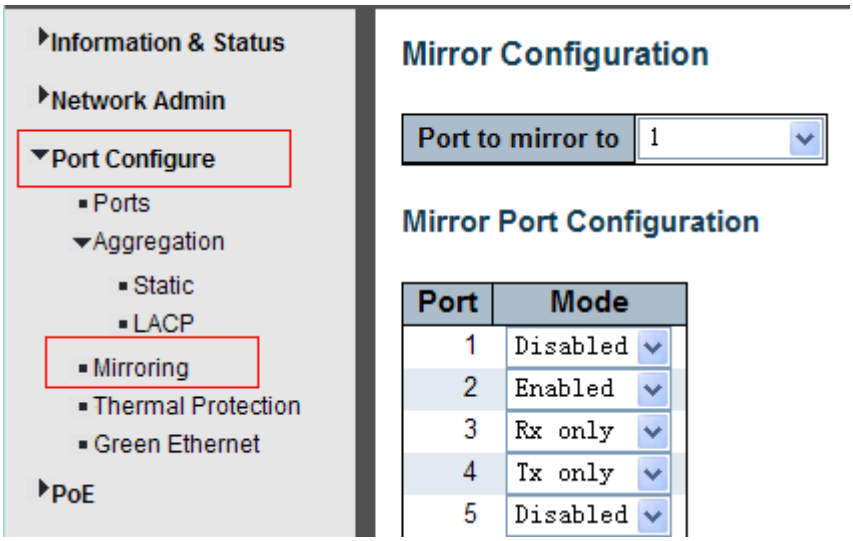


Figure 3-4Mirror Configuration Screen

Configuration object and description is:

Object	Description
Port mirror to	Frames from ports that have either source (rx) or destination (tx) mirroring enabled are mirrored on this port. Disabled disables mirroring.
Mode	Select source port mirror mode. Rx only Frames received on this port are mirrored on the mirror port. Frames transmitted are not mirrored. Tx only Frames transmitted on this port are mirrored on the mirror port. Frames received are not mirrored. Disabled Neither frames transmitted nor frames received are mirrored. Enabled Frames received and frames transmitted are mirrored on the mirror port. Note: For a given port, a frame is only transmitted once. It is therefore not possible to mirror mirror port Tx frames. Because of this, mode for the selected mirror port is limited to Disabled or Rx only.

Click "Save" to store and active settings.

Note: You can not set fast speed port(s) mirror to a low speed port. For example, there is problem if

you try to mirror 100Mbps port(s) to a 10 Mbps port. So destination port should has equal or higher speed comparing to source port. Besides, source port and destination port should not be same one.

3.4 Thermal Protection Configuration

Thermal protection is for detecting and protecting working switch. When switch detected port temperature is higher that defined temperature, system will disable the port, to protect the switch.

After click "Port Configure">"Thermal Protection", followed screen will appear as:

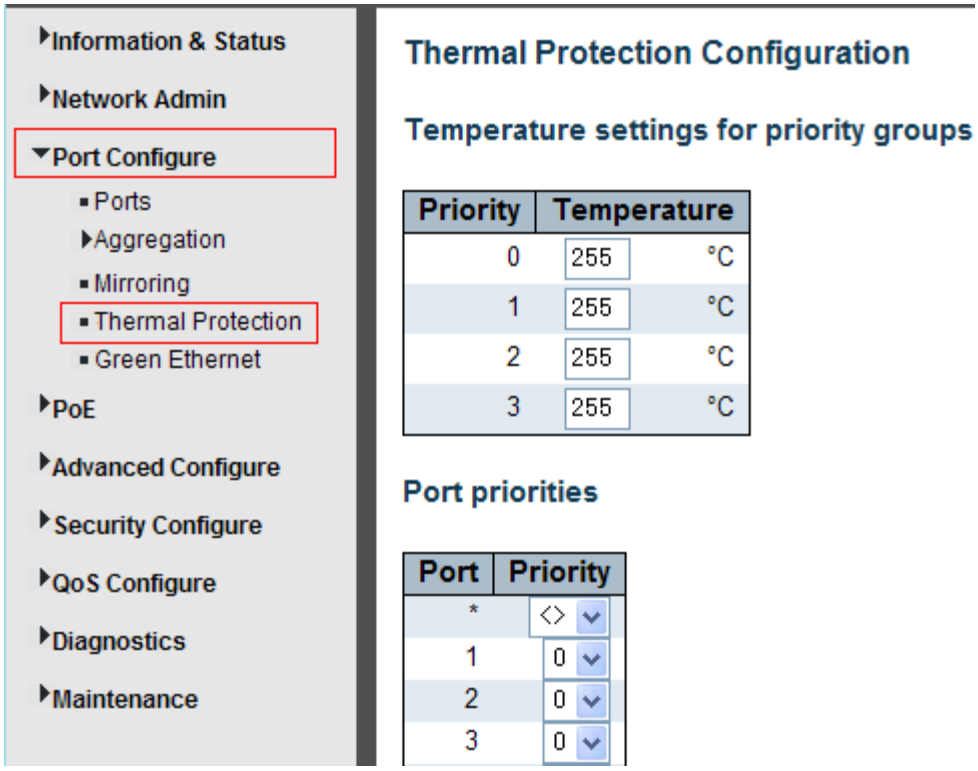


Figure 3-5Thermal Protection Configuration Screen

Configuration object and description is:

Object	Description
Temperature settings for priority groups	This switch support 4 Thermal Protection priority groups, and each of them can have a defined temperature for protection.
Port priorities	Define which priority group that port belong to.

Click "Save" to store and active settings.

Note: By default, all ports of switch are belong to Priority Group 0, with protected temperature 225 degree C.

4.PoE Configuration

Power-over-Ethernet (PoE), means Ethernet network power supply via 100BASE-TX, 1000BASE-T. Its maximum power distance is 100 meters. By PoE power system, based on Ethernet wiring network of UTP Cat5 or higher Cable, it can give power to IP camera, VoIP phone, wireless AP, as well as transmit data. So there is no need to concern about the power wire building, reducing the cost of networking building.

PoE power supply system has unified standard, IEEE 802.3af and 802.3at. So devices from different manufacturers have no problem in general usage, as long as they are complied with these standards.

PD, it is defined aspowered device in the PoE Power Supply System , primarily including IP camera, wireless AP, network VoIP phone, and other IP-based terminal equipment.

The whole process of PoE:
1. Detection: At beginning, PSE device output a very small voltage, to detect and judge if its linked PD is IEEE802.3af / IEEE802.3at compliant device. Only if detected that PD is a standard compliant device, then it will go to next step.
2. PDClassification: After detected PDs, PSE will classify them and recognize what is the power that PD required.
3. Power up: When above 2 steps finished, PSE start feeding required power for PD, with 44~57VDC output voltage.
4. Power supply: PSE provides stable 44~57V DC to PDs, and auto feeding power as requirement of PDs. Maximum power of single PoE port for IEEE 802.3af devices: 15.4W; Maximum power of single PoE port for IEEE 802.3at devices: 25.5W.
5. Disconnection: If PD is disconnected or user disable PoE from management software, PSE will quickly(300-400ms) stop powering PD.

In any moment of PSE powering PD process, PSE will stop working and then restart from step1 if abnormal situation happens, such as PD Short circuit, power consumption is higher than feeding power, and so on.

4.1 PoE Setting

After click "PoE">"PoE Setting", user can make PoE settings in followed screen:

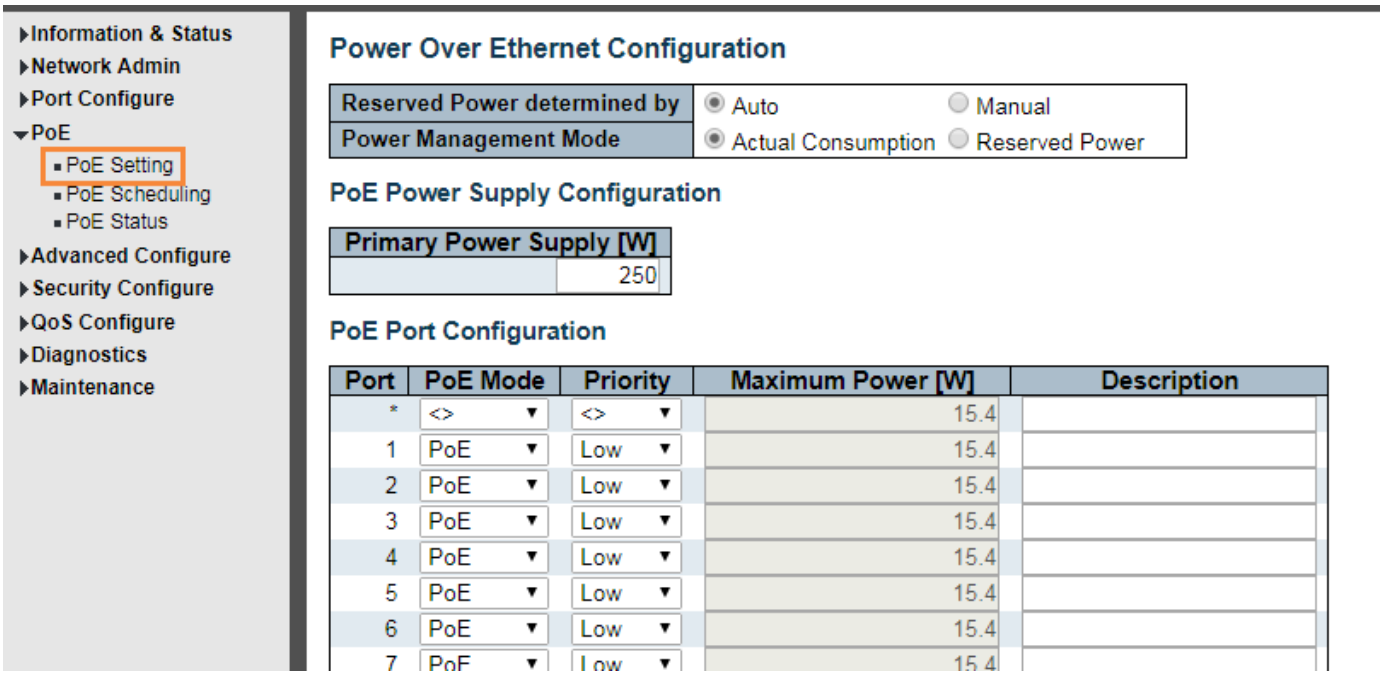


Figure 4-1 PoE Setting Screen

Configuration object and description is:

Object	Description
Reserved Power determined by	This switch supports 2 modes for reserved power determination. Auto: Switch automatically assigned maximum power of switch port according to detected PD class. About PD Class, please refer to the 802.3af / 802.3at definition. Manual: Maximum reserved power of the port is customize by the user.
Power Management Mode	This switch supports 2 modes for Power Management. 1. Actual Consumption: In this mode, when the actual power consumption of all the ports exceeds the switch's power budget, the lowest priority port will be shut down. If all ports have the same priority, then the maximum port number would be shut down. 2. Reserved Power: In this mode, when the reserved power consumption of all the ports exceeds the switch's power budget, the port that connect to new PD will not be enabled.
Primary Power Supply [W]	Users can set the maximum primary power of the whole switch. Default setting is 370W.
PoE Mode	This switch support 802.3af(PoE) and 802.3at(PoE+) mode. Default setting is 802.3at.
Priority	Define the priority of the PoE port. Priority from low to high is Low, High, Critical.
Maximum Power(W)	It is for define port's maximum Power when user set Manual as reserved power determination mode.

Click "Save" to store and active settings.

4.2 PoE Status

In this page, user can check and look PoE status of all ports, after click "PoE">"PoE Status".

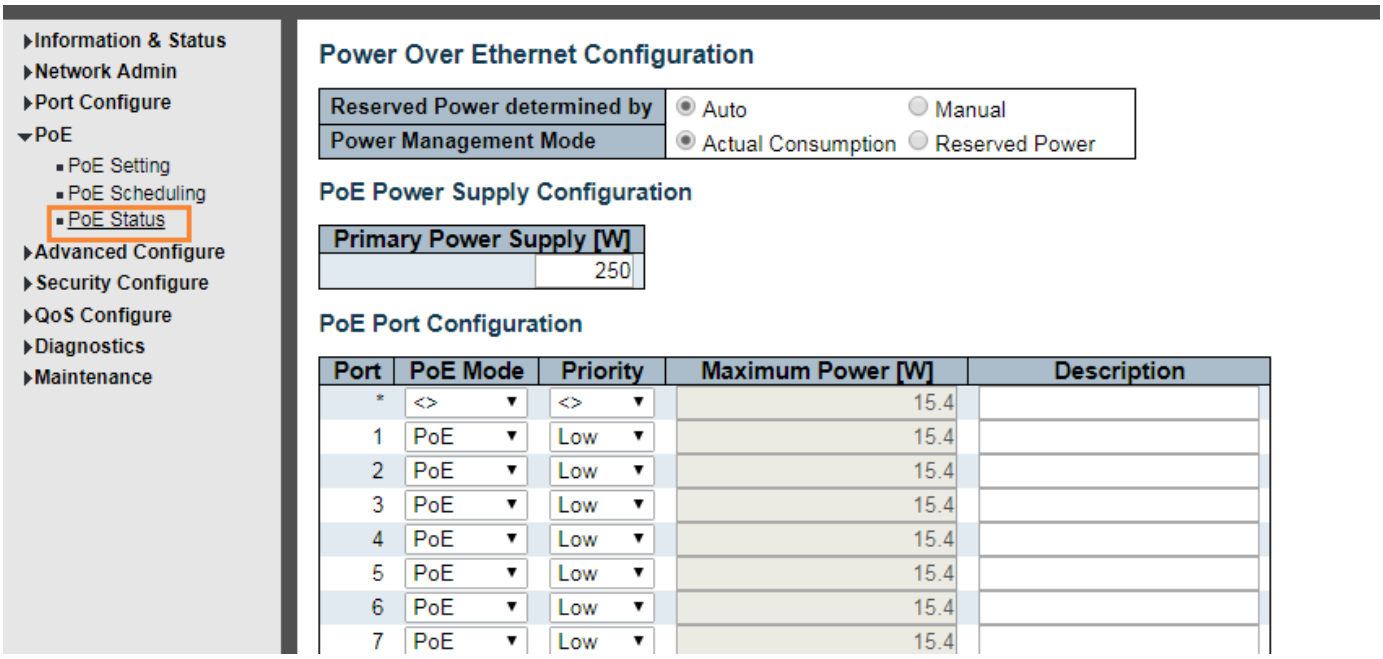


Figure 4-2 PoE Status Screen

4.3 PoE Scheduling

The series supports PoE scheduling, users can set timing PoE reboot and enable/disable PoE on time schedule.

Click "PoE"> "PoE Scheduling", as below:

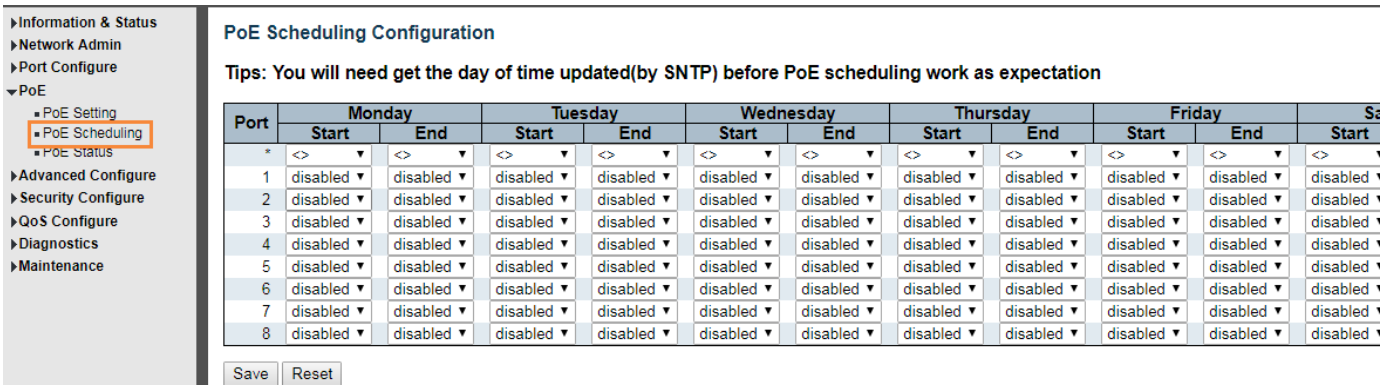


Figure 4.3PoE Scheduling

Object	Instruction
Cycle	Selection range: Monday to Sunday.
Start	Restoration for PoE, Time range: 00:00-24:00
End	Time range: 00:00-24:00

5. Advanced Configure

5.1 VLAN

VLAN(Virtual Local Area Network) logically divides one LAN(Local Area Network) into a plurality of subsets, and each subset will form their broadcast area network. In short, VLAN is a communication technology that logically divides one physical LAN into multiple broadcast area networks (multiple VLAN). Hosts within a VLAN can communicate directly. But VLAN groups can not directly communicate with each other. So it will limit the broadcast packets within a VLAN. Since it can not directly access VLAN groups, thus it improves network security.

Click "Advanced Configure">"VLANs"to see 802.1Q VLAN configuration screen as following:

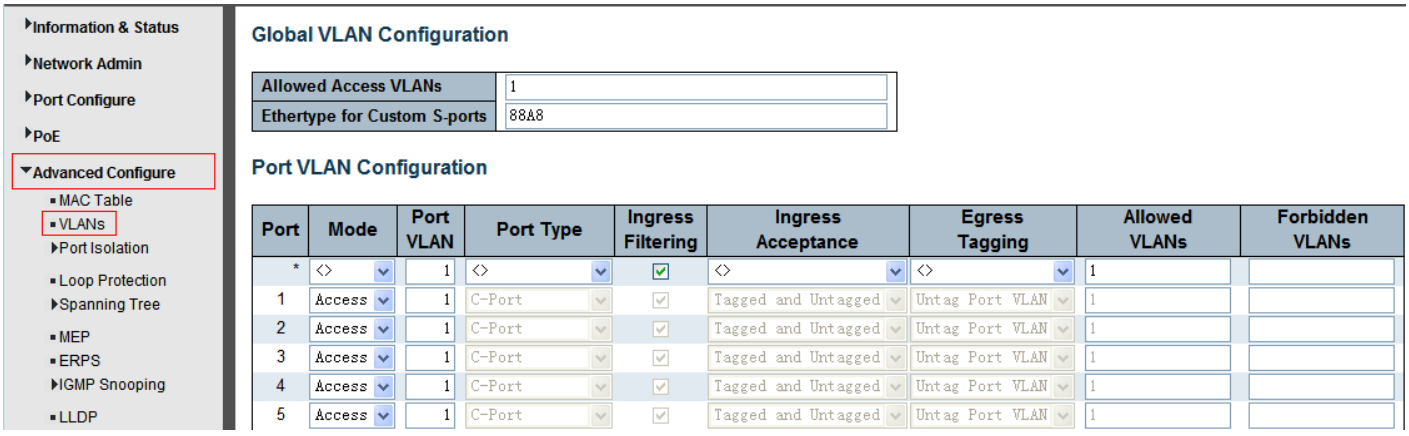


Figure 5-1802.1Q VLAN Configuration Screen

Configuration object and description is:

Object	Description
Allowed VLANs	Here displays created VLAN ID. It is 1 by default. If you want to create new VLAN, just need to add VLAN ID here.

Ethertype for Custom S-ports	This field specifies the ethertype/TPID (specified in hexadecimal) used for Custom S-ports. The setting is in force for all ports whose Port Type is set to S-Custom-Port.
Mode	The port mode (default is Access) determines the fundamental behavior of the port in question. A port can be in one of three modes as described below. Whenever a particular mode is selected, the remaining fields in that row will be either grayed out or made changeable depending on the mode in question. Grayed out fields show the value that the port will get when the mode is applied. **Access:** Access ports are normally used to connect to end stations. Access ports have the following characteristics: • Member of exactly one VLAN, the Port VLAN (a.k.a. Access VLAN), which by default is 1 • Accepts untagged and C-tagged frames • Discards all frames that are not classified to the Access VLAN • On egress all frames classified to the Access VLAN are transmitted untagged. Other (dynamically added VLANs) are transmitted tagged **Trunk:** Trunk ports can carry traffic on multiple VLANs simultaneously, and are normally used to connect to other switches. Trunk ports have the following characteristics: • By default, a trunk port is member of all VLANs (1-4094) • The VLANs that a trunk port is member of may be limited by the use of Allowed VLANs • Frames classified to a VLAN that the port is not a member of are discarded • By default, all frames but frames classified to the Port VLAN (a.k.a. Native VLAN) get tagged on egress. Frames classified to the Port VLAN do not get C-tagged on egress • Egress tagging can be changed to tag all frames, in which case only tagged frames are accepted on ingress **Hybrid:** Hybrid ports resemble trunk ports in many ways, but adds additional port configuration features. In addition to the characteristics described for trunk ports, hybrid ports have these abilities: • Can be configured to be VLAN tag unaware, C-tag aware, S-tag aware, or S-custom-tag aware • Ingress filtering can be controlled • Ingress acceptance of frames and configuration of egress tagging can be configured independently
Port VLAN	Determines the port's VLAN ID (a.k.a. PVID). Allowed VLANs are in the range 1 through 4094, default being 1. On ingress, frames get classified to the Port VLAN if the port is configured as VLAN unaware, the frame is untagged, or VLAN awareness is enabled on the port, but the frame is priority tagged (VLAN ID = 0). On egress, frames classified to the Port VLAN do not get tagged if Egress Tagging configuration is set to untag Port VLAN. The Port VLAN is called an "Access VLAN" for ports in Access mode and Native VLAN for ports in Trunk or Hybrid mode.

Port Type	Ports in hybrid mode allow for changing the port type, that is, whether a frame's VLAN tag is used to classify the frame on ingress to a particular VLAN, and if so, which TPID it reacts on. Likewise, on egress, the Port Type determines the TPID of the tag, if a tag is required. **Unaware:** On ingress, all frames, whether carrying a VLAN tag or not, get classified to the Port VLAN, and possible tags are not removed on egress. **C-Port:** On ingress, frames with a VLAN tag with TPID = 0x8100 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with a C-tag. **S-Port:** On ingress, frames with a VLAN tag with TPID = 0x8100 or 0x88A8 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with an S-tag. **S-Custom-Port:** On ingress, frames with a VLAN tag with a TPID = 0x8100 or equal to the Ethertype configured for Custom-S ports get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with the custom S-tag.
Ingress Filter	Hybrid ports allow for changing ingress filtering. Access and Trunk ports always have ingress filtering enabled. If ingress filtering is enabled (checkbox is checked), frames classified to a VLAN that the port is not a member of get discarded. If ingress filtering is disabled, frames classified to a VLAN that the port is not a member of are accepted and forwarded to the switch engine. However, the port will never transmit frames classified to VLANs that it is not a member of.。
Ingress Acceptance	Hybrid ports allow for changing the type of frames that are accepted on ingress. **Tagged and Untagged** Both tagged and untagged frames are accepted. **Tagged Only** Only tagged frames are accepted on ingress. Untagged frames are discarded. **Untagged Only** Only untagged frames are accepted on ingress. Tagged frames are discarded.
Egress Tagging	Ports in Trunk and Hybrid mode may control the tagging of frames on egress. **Untag Port VLAN** Frames classified to the Port VLAN are transmitted untagged. Other frames are transmitted with the relevant tag. **Tag All** All frames, whether classified to the Port VLAN or not, are transmitted with a tag. **Untag All** All frames, whether classified to the Port VLAN or not, are transmitted without a tag. This option is only available for ports in Hybrid mode.

Allowed VLANs	Ports in Trunk and Hybrid mode may control which VLANs they are allowed to become members of. Access ports can only be member of one VLAN, the Access VLAN. The field's syntax is identical to the syntax used in the Enabled VLANs field. By default, a Trunk or Hybrid port will become member of all VLANs, and is therefore set to **1-4094**. The field may be left empty, which means that the port will not become member of any VLANs.
Forbidden VLANs	A port may be configured to never be member of one or more VLANs. This is particularly useful when dynamic VLAN protocols like MVRP and GVRP must be prevented from dynamically adding ports to VLANs. The trick is to mark such VLANs as forbidden on the port in question. The syntax is identical to the syntax used in the Enabled VLANs field. By default, the field is left blank, which means that the port may become a member of all possible VLANs.

Click "Save" to store and active settings.

5.2 Port Isolation

Port isolation is for limiting data between ports. It is similar to VLAN, but stricter.

5.2.1 Port Group

This switch supports port groups. Members of port group can forward date.

Note: port can belong to multiple port groups. Data can be forwarded among any port that belongs to one port group.

After Click "Advanced Configure">"Port Isolation">"Port Group," then followed screen will appear for making port group configuration.

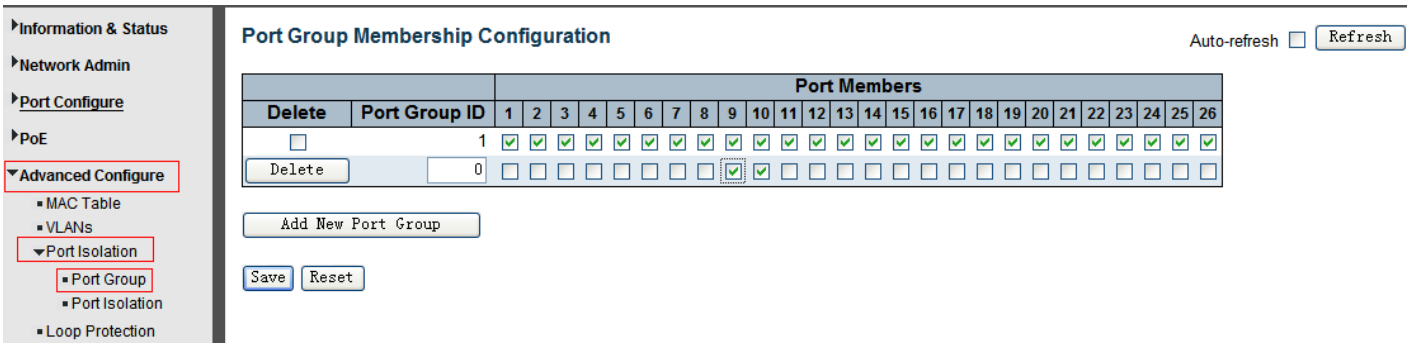


Figure 5-2 Port Group Configuration Screen

Configuration object and description is:

Object	Description

Port Members	Check the corresponding box to set them as one port group.

Click "Add New Port Group" to create a new port group, "Delete" to remove the corresponding port group, and "Save" to store and active settings.

5.2.2 Port Isolation

After Click "Advanced Configure">"Port Isolation">"Port Isolation", then followed screen will appear for making port isolation configuration.

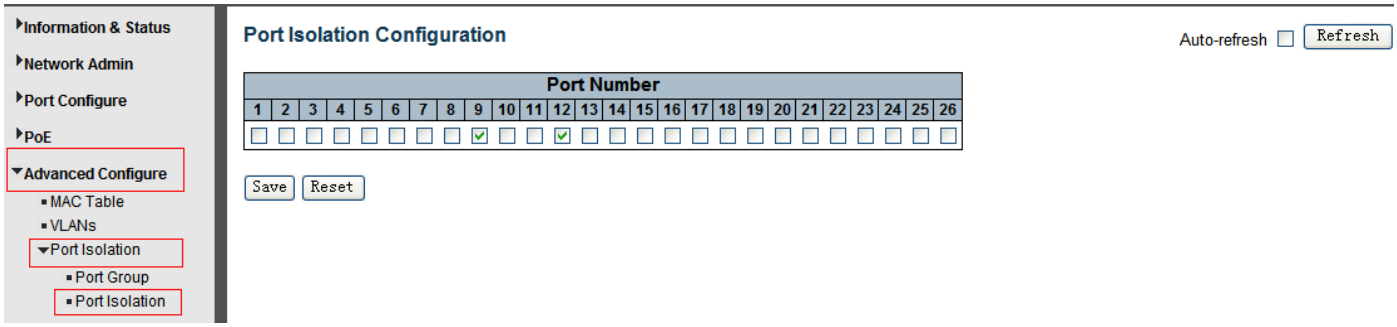


Figure 5-3 Port Isolation Configuration Screen

Configuration object and description is:

Object	Description
Port Number	Check box to set corresponding port as port isolation, so that they can not forward data flow.

Click "Save" to store and active settings.

5.3 STP

The Spanning Tree Protocol (STP) can be used to detect and disable network loops, and to provide backup links between switches, bridges or routers. This allows the switch to interact with other bridging devices in your network to ensure that only one route exists between any two stations on the network, and provide backup links that automatically take over when a primary link goes down.

5.3.1 STP Bridge Settings

This page allows you to configure port STP settings. After Click "Advanced Configure">"Spanning Tree">"Bridge Settings," followed screen will appear.

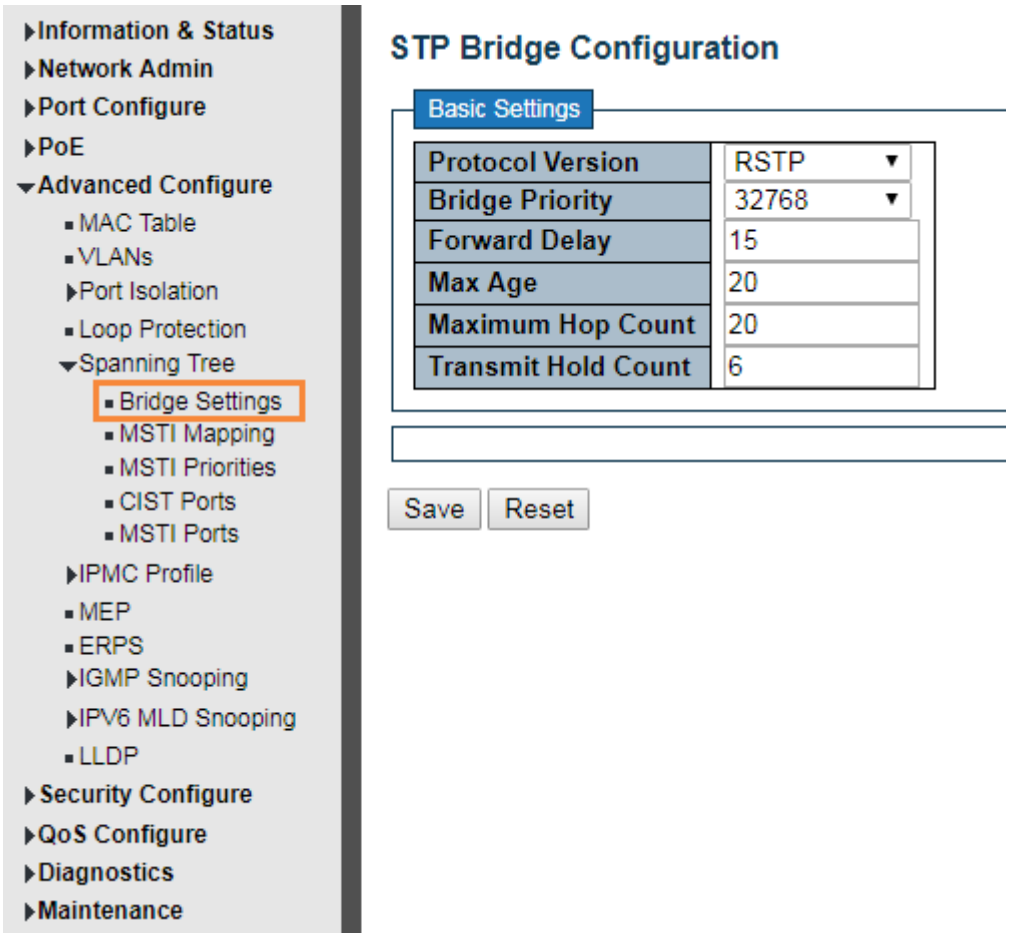


Figure 5-4 Spanning Tree Configuration Screen

Configuration object and description is:

Object	Description
Protocol Version	Click drop-down menu to select STP protocol version, including: STP - Spanning Tree Protocol (IEEE802.1D); RSTP - Rapid Spanning Tree Protocol (IEEE802.1w)
Bridge Priority	Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a *Bridge Identifier*.
Forward Delay (4-30)	Forward Delay setting range is from 4 to 30 seconds. Default value is 15 seconds.
Max Age (6-40)	The maximum age of the information transmitted by the Bridge when it is the Root Bridge. Valid values are in the range 6 to 40 seconds. Default value is 20 .
Maximum Hop Count (6-40)	This defines the initial value of remaining Hops for MSTI information generated at the boundary of an MSTI region. It defines how many bridges a root bridge can distribute its BPDU information. Valid values are in the range 6 to 40 hops.

Transmit Hold Count (1-10)	The number of BPDU's a bridge port can send per second. When exceeded, transmission of the next BPDU will be delayed. Valid values are in the range 1 to 10 BPDU's per second. Default value is 6 .

Click "Save" to store and active settings.

5.3.2MSTI Mapping

Users can set the mapping, Click "Advanced Configure"> "Spanning Tree"> "MSTI Mapping".

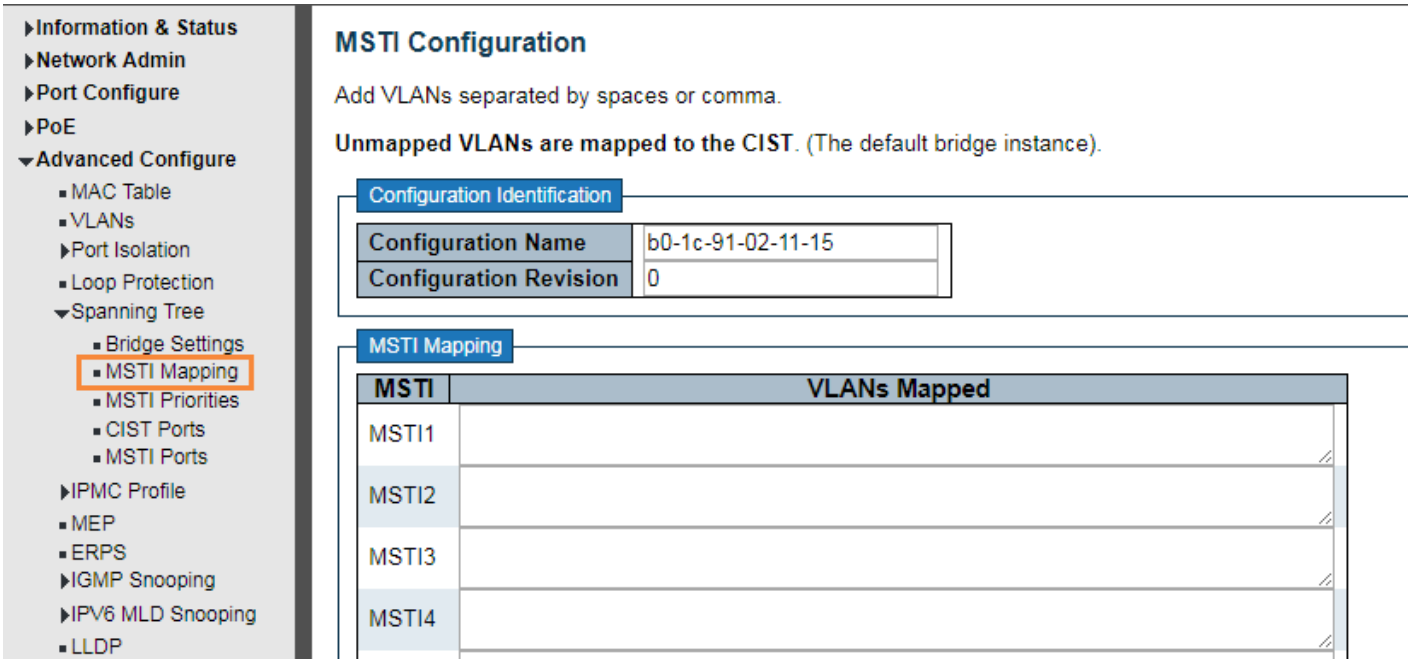


Figure 5-3-2 MSTI Mapping Setting

Configuration Instruction

Object	Instruction
Configuration Name	Set domain name of MSTP
Configuration Revision	Set Configuration Revision
MSTI Mapping	Input the VLAN that need mapping

Click "Save" to enable your settings.

Note: Please set the same value for configuration name and configuration revision of all switches in the looped network when set MSTP

5.3.3 MSTI Priorities

Users can set MSTI priorities, click "advanced configure"> "Spanning Tree"> "MSTI Priorities"

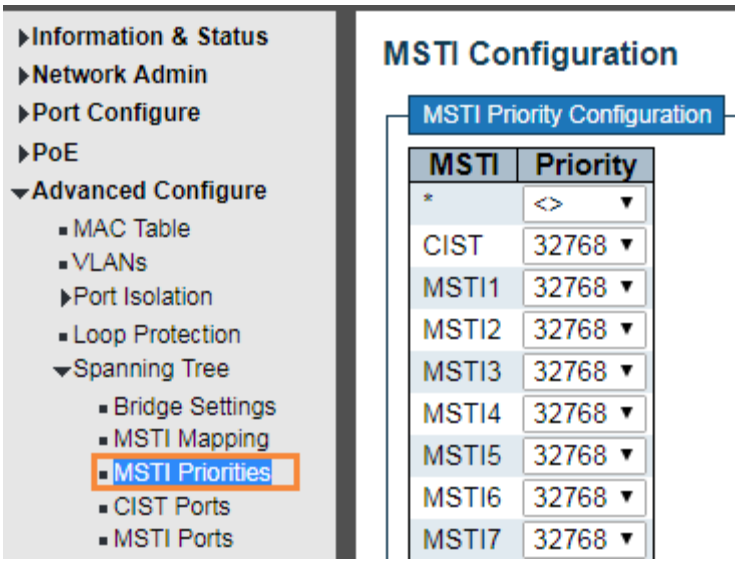


图 5-3-3 MSTI Priorities Setting

Configuration Instruction

Object	Instruction
MSTI Priorities	Set the priority, value ranges: 0-61440

Click "Save" to enable your settings.

Note: The priority value must be in multiples of 4094, at the range of 0-61440

5.3.4 STP Bridge Port

After Click "Advanced Configure">"Spanning Tree">"Bridge Ports," followed screen will appear.

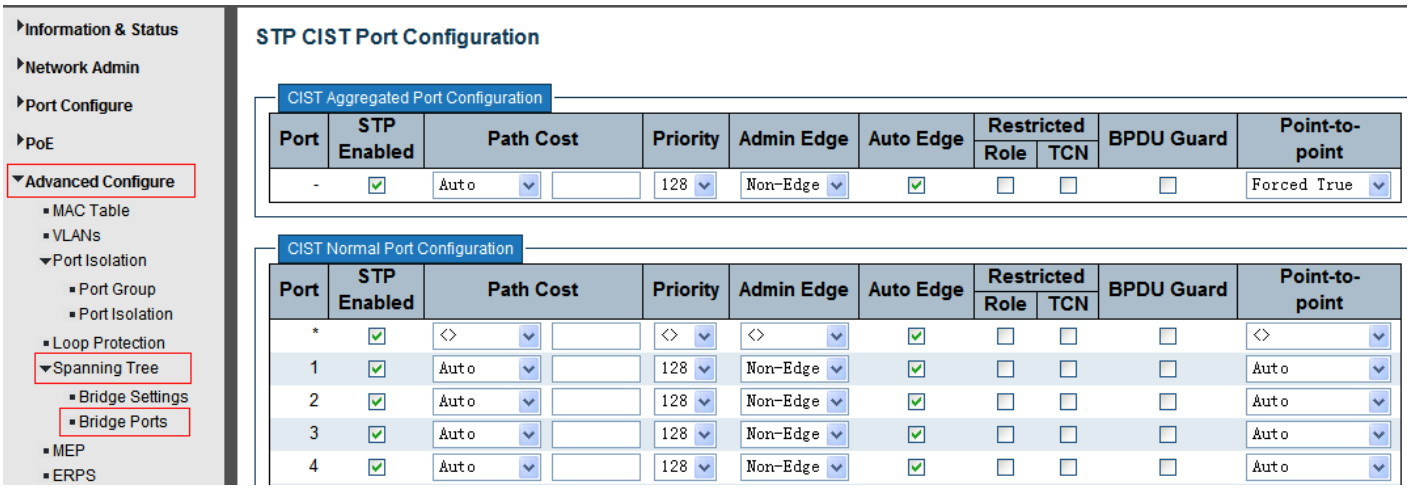


Figure 5-5 STPConfiguration Screen

Configuration object and description is:

Object	Description
STP Enabled	Check to enable STP function.
Path Cost(0=Auto)	Controls the path cost incurred by the port. The Auto setting will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values. Using the Specific setting, a user-defined value can be entered. The path cost is used when establishing the active topology of the network. Lower path cost ports are chosen as forwarding ports in favour of higher path cost ports. Valid values are in the range 1 to 200000000.
Priority	Controls the port priority. This can be used to control priority of ports having identical port cost. (See above).
Auto Edge	Check box to set corresponding port as Auto Edge.
Restricted Role	Check box to set corresponding port as Restricted Role
Restricted TCN	Check box to set corresponding port as Restricted TCN
BPDU Guide	Check box to enable BPDU Guide. So when port receives BPDU reception, it will turn to Disable(Shut Down) status.
Point-to-point	Controls whether the port connects to a point-to-point LAN rather than a shared medium. This can be automatically determined, or forced either true or false. Transition to the forwarding state is faster for point-to-point LANs than for shared media.(This applies to physical ports only. Aggregations are always forced Point2Point.

Click "Save" to store and active settings.

5.3.5 MSTI Ports

Users can set MSTI ports, click "Advanced Configure"> "Spanning Tree"> "MSTI Ports"

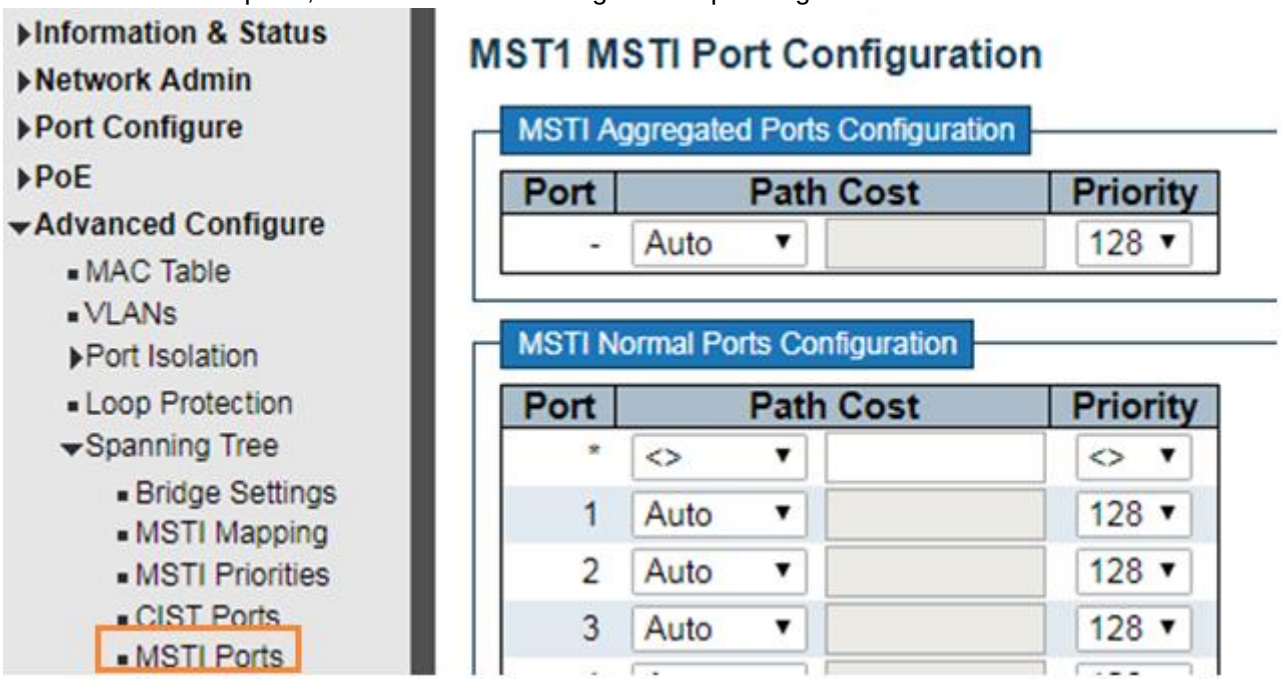


Figure 5-3-5 MSTI Ports Setting

Configuration Instruction

Object	Instruction
Path Cost	Used to define a metric, representing the associated overhead of forwarding packets to a specified port list.The port overhead can be automatically set or set to a metric value.The default value is 0 (automatic).The lower the number, the more likely it is to select the port to forward the packet. Controls the path cost incurred by the port. The Auto setting will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values. Using the Specific setting, a user-defined value can be entered. The path cost is used when establishing the active topology of the network. Lower path cost ports are chosen as forwarding ports in favour of higher path cost ports. Valid values are in the range 1 to 200000000.
Priority	When the port's path overhead is the same, the priority is used to decide the forwarding state of the port.

5.4 MAC Address Table

This page allows you to configure Mac address table settings. After Click "Advanced Configure">"Mac Table," followed screen will appear.

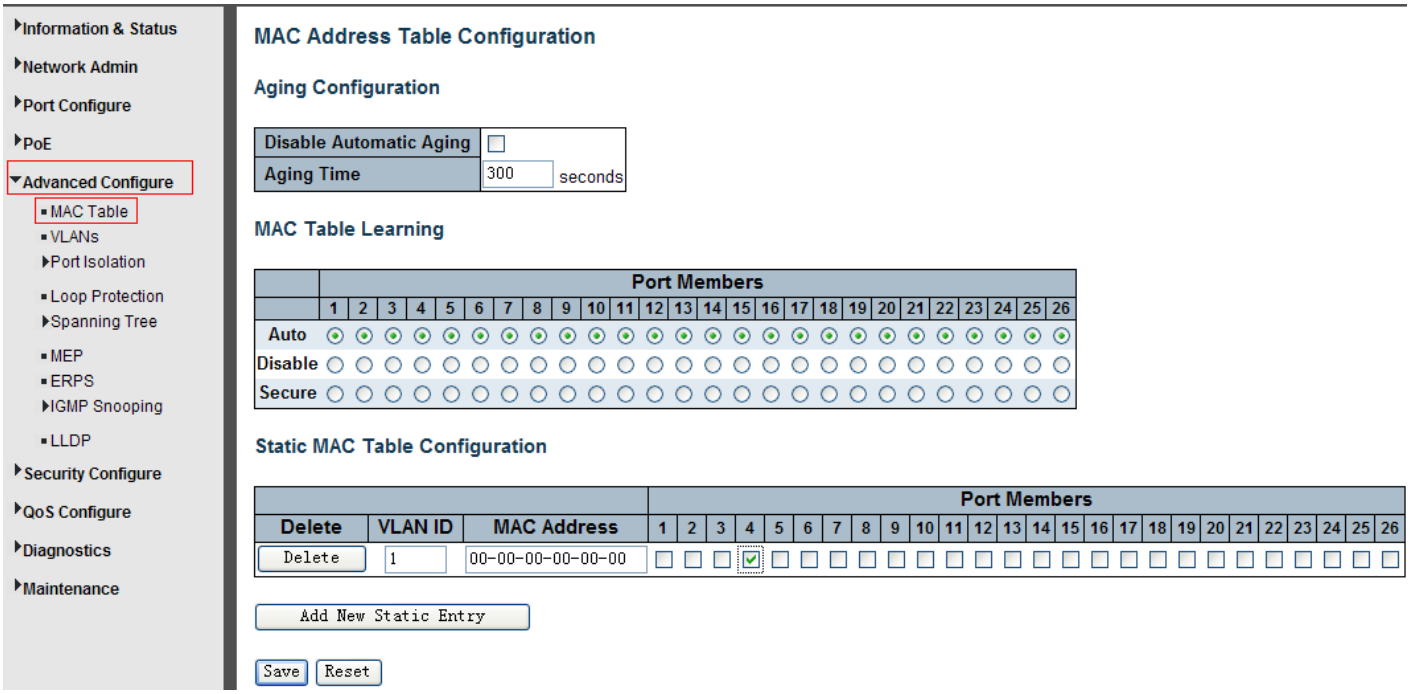


Figure 5-6 MAC Address Table Configuration Screen

Configuration object and description are:

Object	Description
Disable Automatic Aging	If the box is checked, then the automatic aging function is disabled.
Aging Time	The Time after which a learned entry is discarded. Range: 10-1000000 seconds; Default: 300 seconds.
MAC Table Learning	This switch supports 3 types for MAC Table Learning 1. Auto: port will auto learn Mac address. 2. Disable: port will NOT learn MAC address. 3. Secure: port only forward data of configured static MAC address.
Static MAC Table Configuration	The static entries in the MAC table are shown in this table. Click "Add New Static Entry" to create a new record.

Click "Save" to store and active settings.

5.5 IGMP Snooping

Internet Group Management Protocol (IGMP) lets hosts and routers share information about multicast group memberships. IGMP snooping is a switch feature that monitors the exchange of IGMP messages and copies them to the CPU for feature processing. The overall purpose of IGMP Snooping is to limit the forwarding of multicast frames to only ports that are a member of the multicast group.

5.5.1 Basic Configuration

After Click "Advanced Configure">"IGMP Snooping">"Basic Configuration", followed screen will appear.

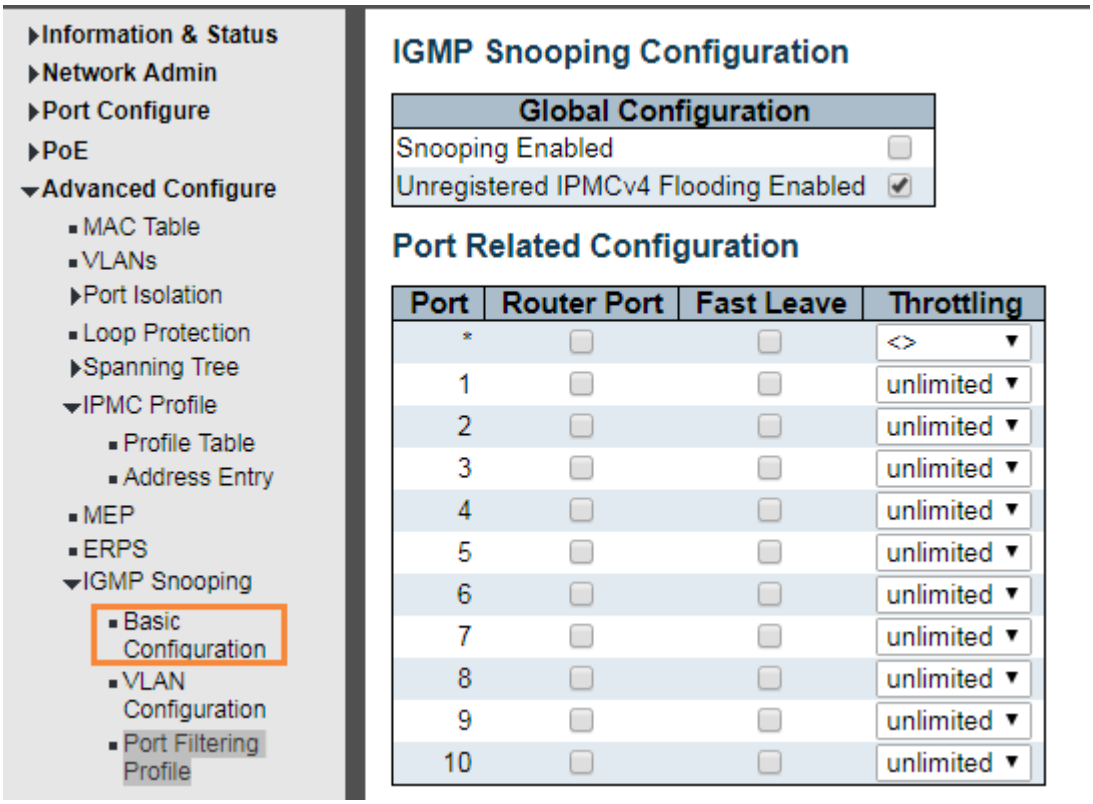


Figure 5-7 IGMP Snooping Basic Configuration

Configuration object and description is:

Object	Description
Snooping Enabled	Enableor disable the IGMP snooping. The default value is "Disabled". Enable: check the box; Disable: do not check the box.
Unregistered IPMCv4 Flooding Enabled	Check the box to enable unregistered IPMCv4 Flooding
Router Port	Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier. If an aggregation member port is selected as a router port, the whole aggregation will act as a router port.

Fast Leave	Fast leave performs deleting MAC forward entry immediately upon receiving message for group de-registration

Click "Save" to store and active settings.

5.5.2 IGMP Snooping VLAN Configuration

After Click "Advanced Configure">"IGMP Snooping">"VLAN Configuration", followed screen will appear.

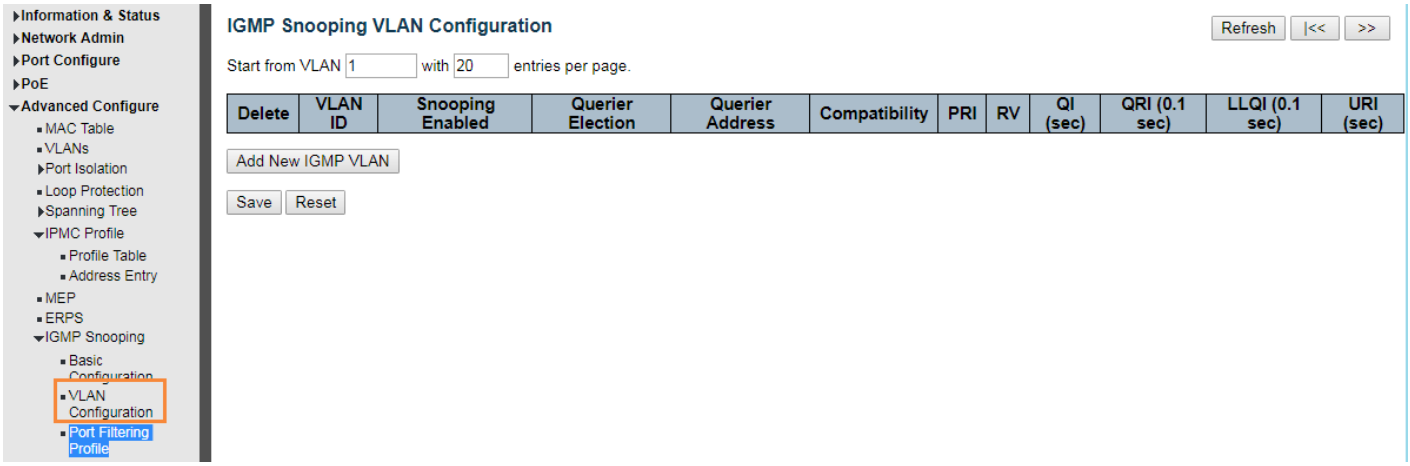


Figure 5-7 IGMP Snooping VLANConfiguration

Configuration object and description are:

Object	Description
Snooping Enabled	Enable the per-VLAN IGMP Snooping. Up to 32 VLANs can be selected for IGMP Snooping.
Querier Election	Enable to join IGMP Querier election in the VLAN. Disable to act as an IGMP Non-Querier.
Querier Address	Define the IPv4 address as source address used in IP header for IGMP Querier election.When the Querier address is not set, system uses IPv4 management address of the IP interface associated with this VLAN.When the IPv4 management address is not set, system uses the first available IPv4 management address.Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

Click "Save" to store and active settings.

5.5.3 Port Filtering Profile

Set Port filtering profile, click "Advanced Configure"> "IGMP Snooping"> "Port Filtering Profile"

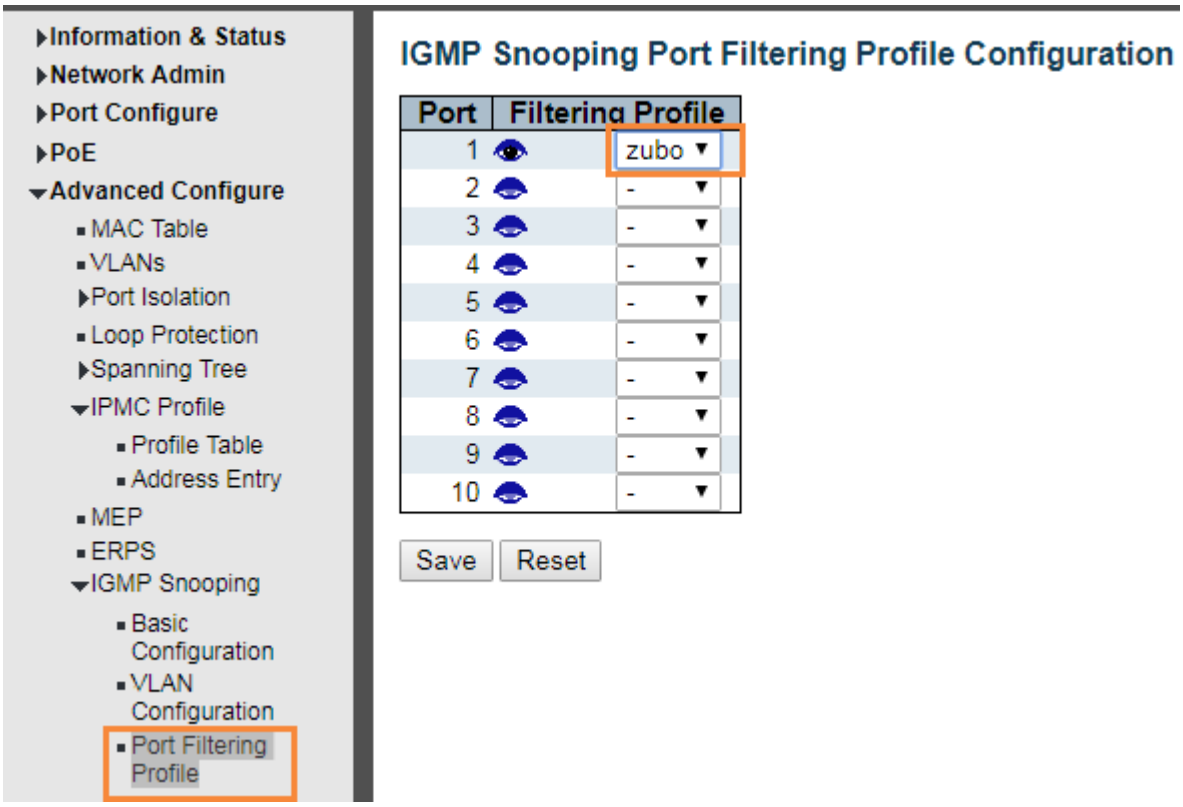


Figure 5-5-3 Port Filtering Profile Setting

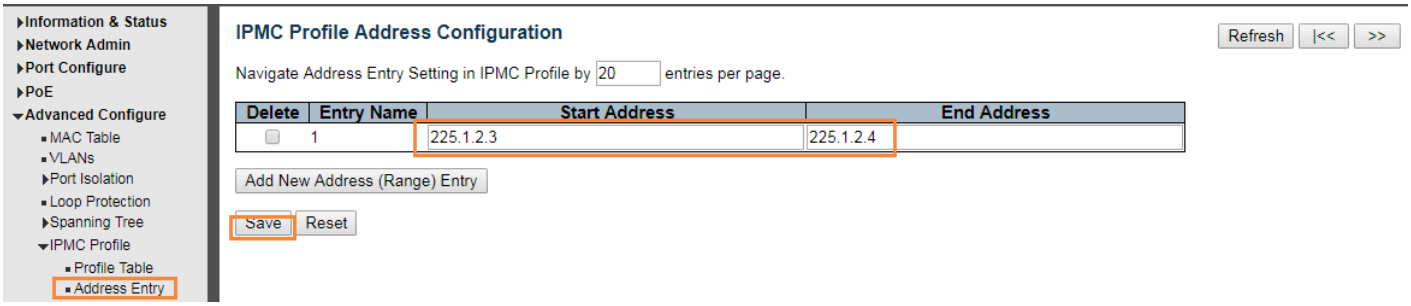
Configuration Instruction

Object	Instruction
VLAN ID	
Enable Snooping	Enable the per-VLAN IGMP Snooping. Up to 32 VLANs can be selected for IGMP Snooping.
Querier（Querier Election）	Enable to join IGMP Querier election in the VLAN. Disable to act as an IGMP Non-Querier.
Querier（Querier Address）	Define the IPv4 address as source address used in IP header for IGMP Querier election. When the Querier address is not set, system uses IPv4 management address of the IP interface associated with this VLAN. When the IPv4 management address is not set, system uses the first available IPv4 management address. Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

Click "Save" to enable your setting.

5.6 IPMC Profile

Users can set the filter multicast list, Click "Advanced Configure"> "IPMC Profile"> "Address Entry"



Configuration Instruction

Object	Instruction
Entry Name	Input the name of the group to be filtered
Start Address	Input the start group address
End Address	Input the end group address

Click "Save" to enable your setting.

Bind the filter multicast list, click "Advanced Configure"> "IPMC Profile"> "Profile Table

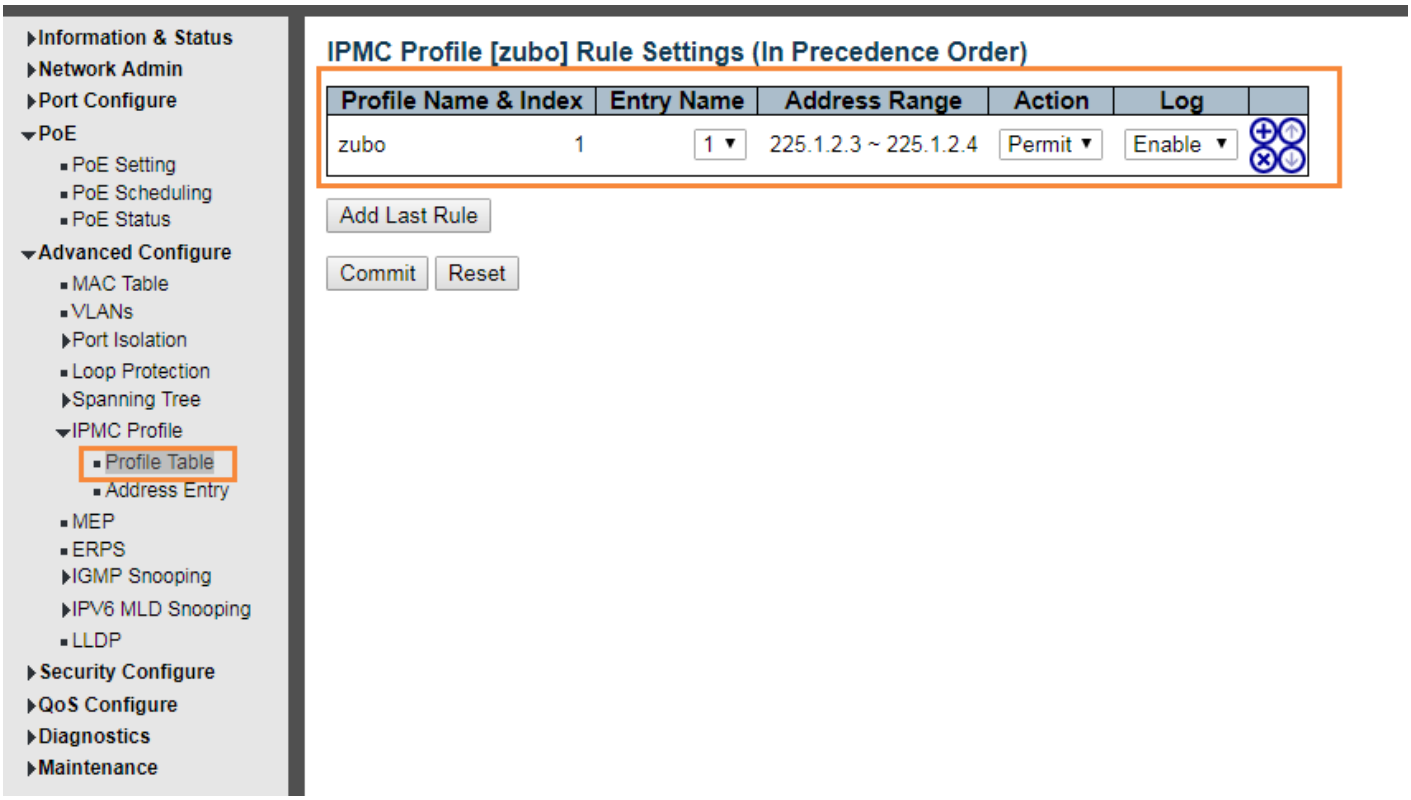


Figure 5-6 IGMP Snooping Setting

Object	Instruction
Entry Name	Choose created Address Entry by dropping down the menu.
Action	Choose Deny / Permit
Log	Enable / Disable

5.7 IPV6 MLD Snooping

IPV6 MLD Snooping is a multicast management and control mechanism working on the Layer 2 Ethernet switch

When enabling IPV6 MLD Snooping, the switch receives the IPV6 MLD message by listening for each interface, to exchange interface and multicast group address mapping relationship, and according to establish the mapping relationship to forward the multicast data flow.

5.7.1 Basic Configuration

Click "Advanced Configure"> "IPv6 MLD Snooping"> "Basic Configuration", to check the configuration information of IPv6 MLD Snooping.

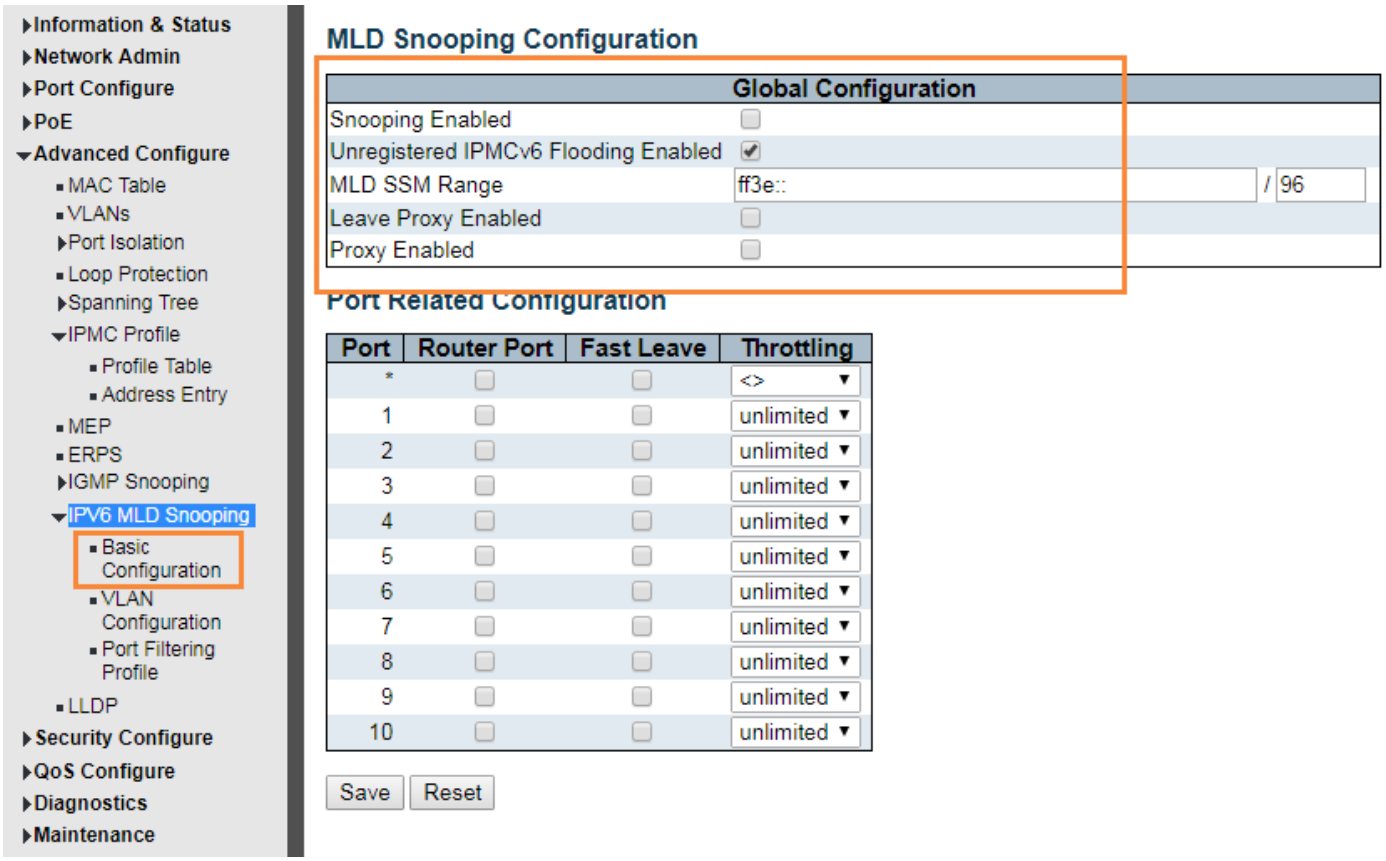


Figure 5-7-1 IGMP Snooping Basic Setting

Configuration Instruction

Object	Instruction
Snooping Enable	Enable/ Disable IGMP Snooping
Unregistered IPMCv6 Flooding Enable	
Router Port	Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or MLD querier. If an aggregation member port is selected as a router port, the whole aggregation will act as a router port.
Fast leave	Fast leavePerforms deleting MAC forward entry immediately upon receiving a message for group de-registration

Click "Save" to enable your setting.

5.7.2 VLAN Configuration

Click "Advanced Configure"> "IPv6 MLD Snooping"> "VLAN Configuration", to check configuration information of IPv6 MLD Snooping.

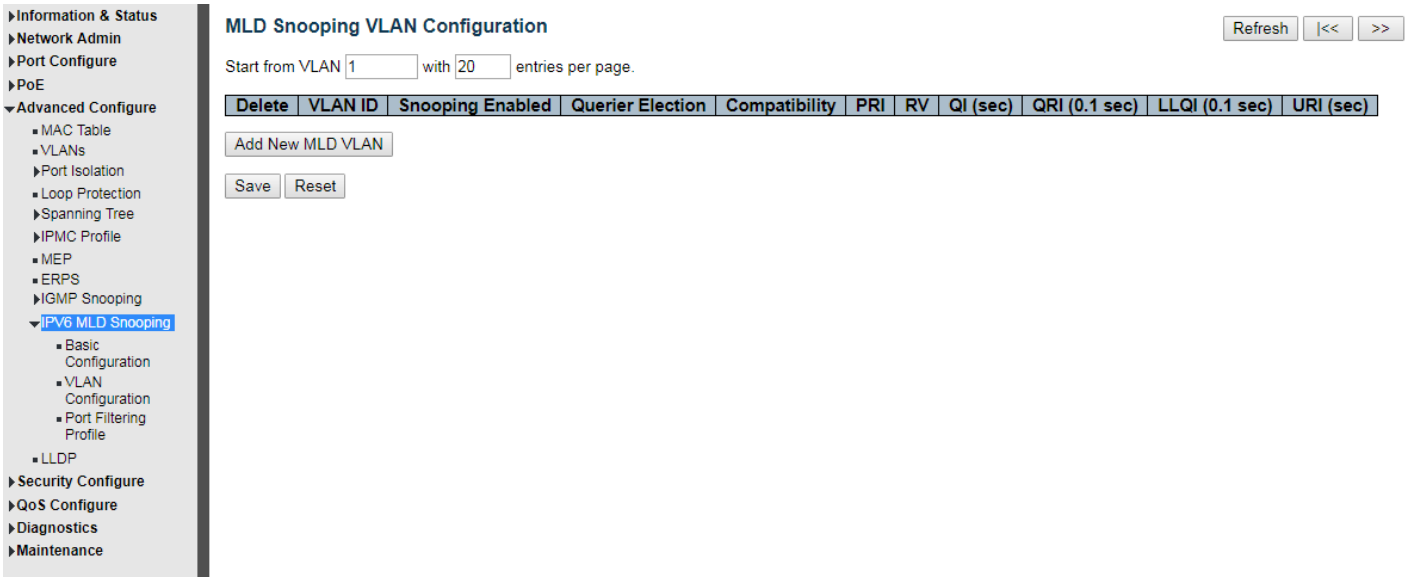


Figure 5-7-2 IPV6 MLD Snooping Setting

Configuration Instruction

Object	Instruction
VLAN ID	
Snooping Enable	Enable the per-VLAN IGMP Snooping. Up to 32 VLANs can be selected for IGMP Snooping.

Querier（Querier Election）	Enable to join MLD Querier election in the VLAN. Disable to act as an MLD Non-Querier.

Click "Save" to enable your setting.

5.8 ERPS

ERPS (Ethernet Ring Protection Switching), integrates OAM function, and APS protocol. If the ring network was interrupted accidentally, the fault recovery times could be less than 50ms to bring the system back to normal operation quickly. ITU-T G.8032 is the first industry-standard for ERPS.

Note: Before enabling ERPS, the STP of the ring port should be disabled.

After Click "Advanced Configure">"ERPS," the following screen will appear.

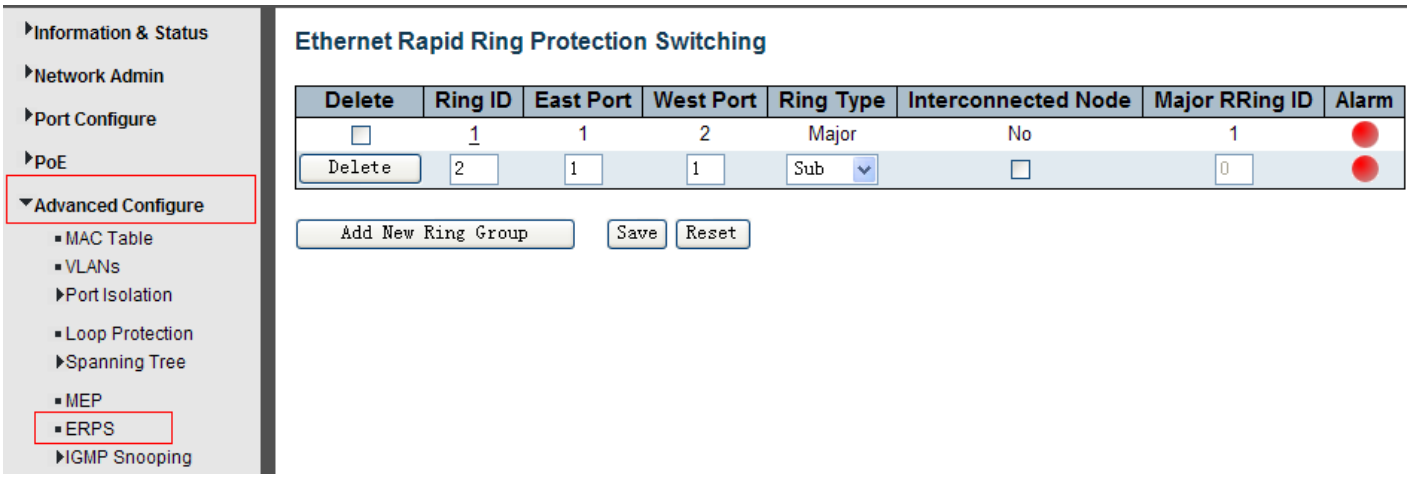


Figure 5-8EPRSConfiguration

Configuration object and description are:

Object	Description
Ring ID	ERPS Ring ID
East Port	Number of the port which participate in this Ring protection.
West Port	Number of the other port which participate in this Ring protection.
Ring Type	Available selection: "Major Ring" or "Sub Ring". Only in case of Multi Ring application, "Sub Ring" is required to configure. Default Ring Type: "Major Ring". Only if there is multi ring application, it is required to set.

Interconnected Node	In Multi Ring application, Interconnected Node is the node that connect 2 or more rings.
Major Ring ID	In Single Ring application, Major Ring ID is same as Ring ID. In Multi Ring application, Sub Ring has to be type as Major Ring ID.
R-APS VLAN(1-4094)	Define VLAN for R - APS VLAN .

Click "Add New Ring Group"to create a new ERPS ring application.

Click "Save" to store and active settings.

After click the number under "Ring ID", it will go to the page for RingConfiguration as followed screen:

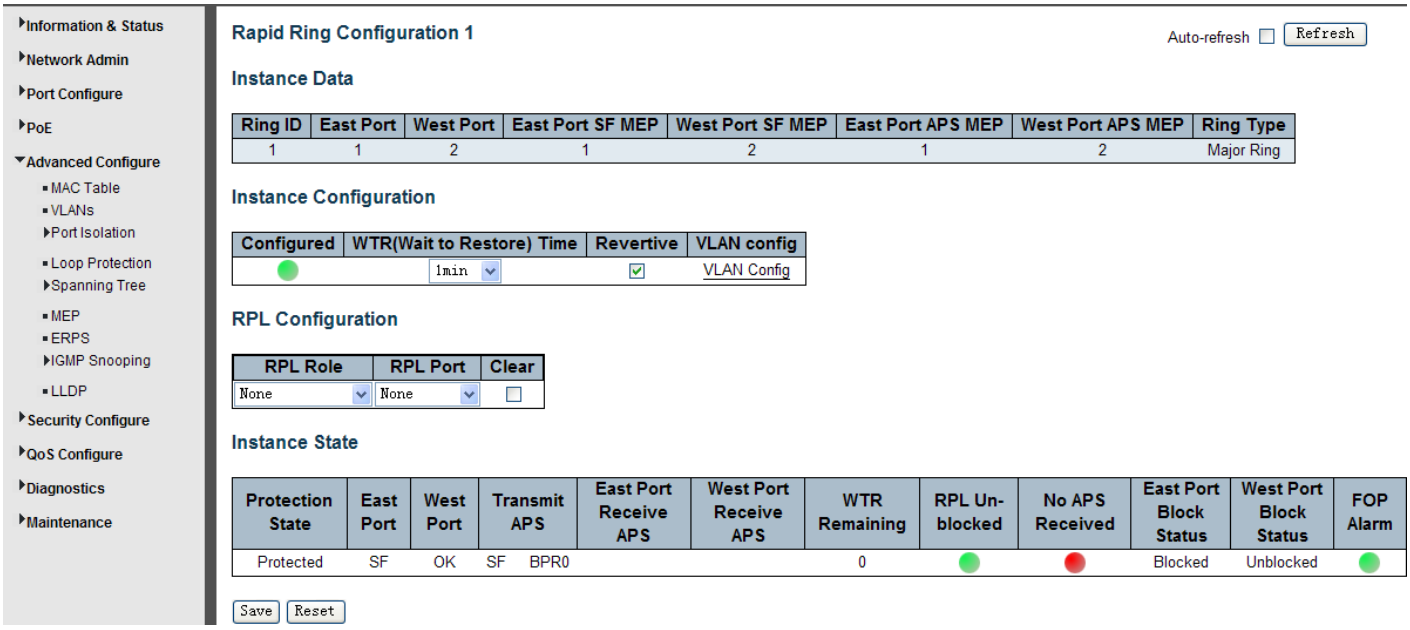


Figure 5-9EPRS Ring Configuration

Configuration object and description is:

Object	Description
WTR(Wait to Restore) Time(1-12)	Click Click drop-down menu to select WTR time for R-APS. Available selection: 1-12min Default: 1 min
Revertive	Check to enable Revertive status of R-APS.
VLAN config	After clicked "VLAN config ", it will go the page of Rapid Ring VLAN Configuration.
RPLRole	Click drop-down menu to select "None", "RPL Owner", or "RPL Neighbor" role.
RPL Port	Click drop-down menu to select "None", "East Port", or "West Port".

Click "Save" to store and active settings.

After clicked " VLAN config ", it will go the page of Rapid Ring VLAN Configuration as following screen:

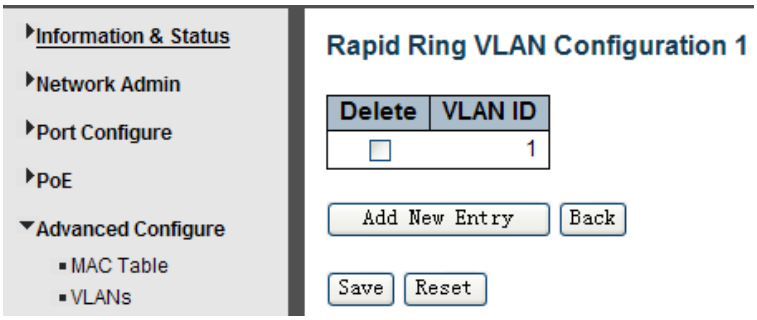


Figure 5-10 Rapid Ring VLAN Configuration

Click "Add New Entry" to create a new entry. Click "Save" to store and active settings.

5.9 LLDP

Link Layer Discovery Protocol (LLDP) is used to discover necessary information about neighboring devices on the local broadcast domain. LLDP is a Layer 2 protocol that uses periodic broadcasts to advertise information about the sending device. Advertised information is represented in Type Length Value (TLV) format according to the IEEE 802.1ab standard and can include details such as device identification, capabilities, and configuration settings. LLDP also defines how to store and maintain information gathered about the neighboring network nodes it discovers.

After Click "Advanced Configure">"LLDP," the following screen will appear.

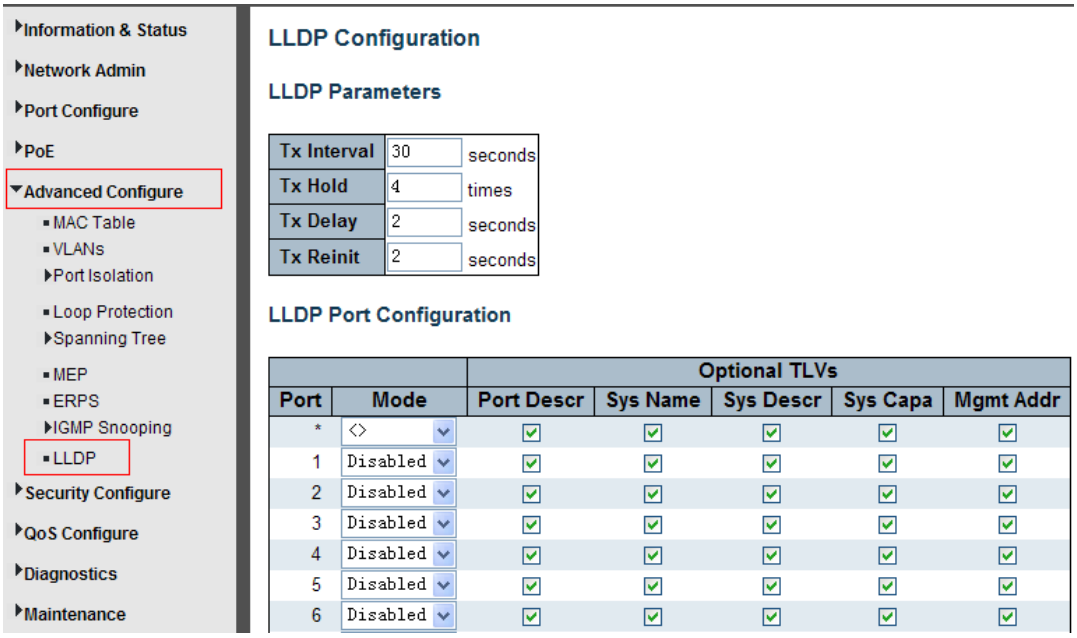


Figure 5-9 LLDPConfiguration Screen

Configuration object and description is:

Object	Description

LLDP Parameters	Here allows the user to inspect and configure the current LLDP port settings: ➢ Tx Interval: Transmission Interval Time ➢ Tx Hold: Hold Time Multiplier ➢ Tx Delay: Transmit Delay Time ➢ Tx Remit: Transmit Remit Time
Mode	Select LLDP messages transmit and receive modes for LLDP Protocol Data Units. Options are Tx only, Rx only, Enabled, and Disabled.
Optional TLVs	To configure the information included in the TLV field of advertised messages. When followed option is checked, corresponding information will be included in LLDP information transmitted. ➢ Port Descr: Port Description ➢ Sys Name: System Name ➢ Sys Descr: System Description ➢ Sys Capa: System Capability ➢ Mgmt Addr: Management Address

Click "Save" to store and active settings.

5.10 Loop Protection

Loop protection is to avoid broadcast loops. After Click "Advanced Configure">"Loop Protection," the following screen will appear.

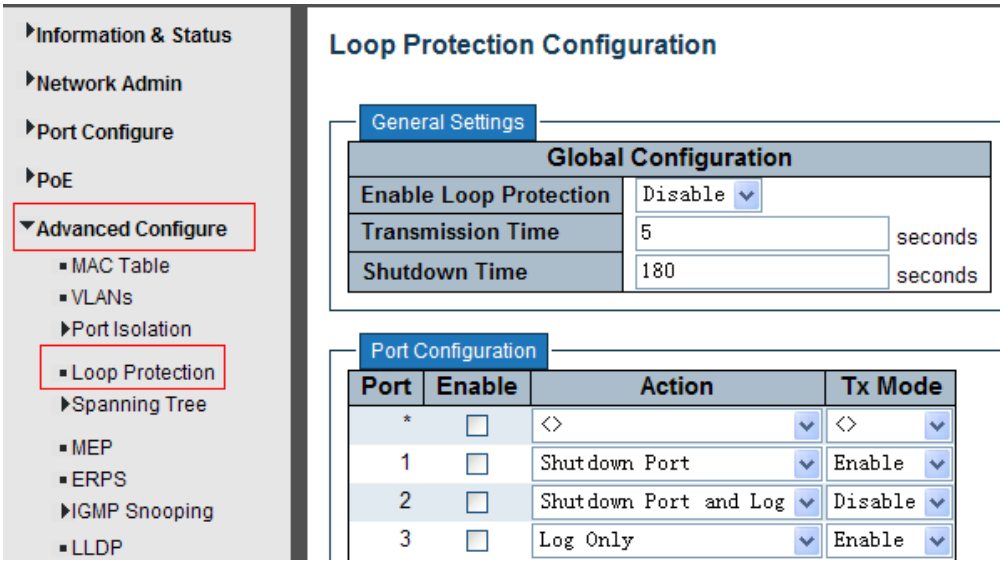


Figure 5-10 Loop ProtectionConfiguration Screen

Configuration object and description is:

Object	Description
Global Configuration	Enable Loop Protection: click drop-down menu to disable or enable Loop Protection; Transmission Time: enter a number to set Loop ProtectionInterval Time; Shutdown Time: enter a number to set port Shutdown Time.

Enable	Check to enable corresponding port loop protection.
Action	Action take when the port detected loop. There are 3 types of action for users to select, Shutdown port, Shutdown port and Log, Log Only.
Tx Mode	To enable or disable Tx.

Click "Save" to store and active settings.

6. QoS Configure

Quality of Service (QoS) is an advanced traffic prioritization feature that allows you to establish control over network traffic. QoS enables you to assign various grades of network service to different types of traffic, such as multi-media, video, protocol-specific, Time-critical, and file-backup traffic. This function not only reserves bandwidth but also limits other traffic that is not so important.

6.1 QoS Port Classification

After Click "QoS Configure">"Port Classification" , followed screen will appear.

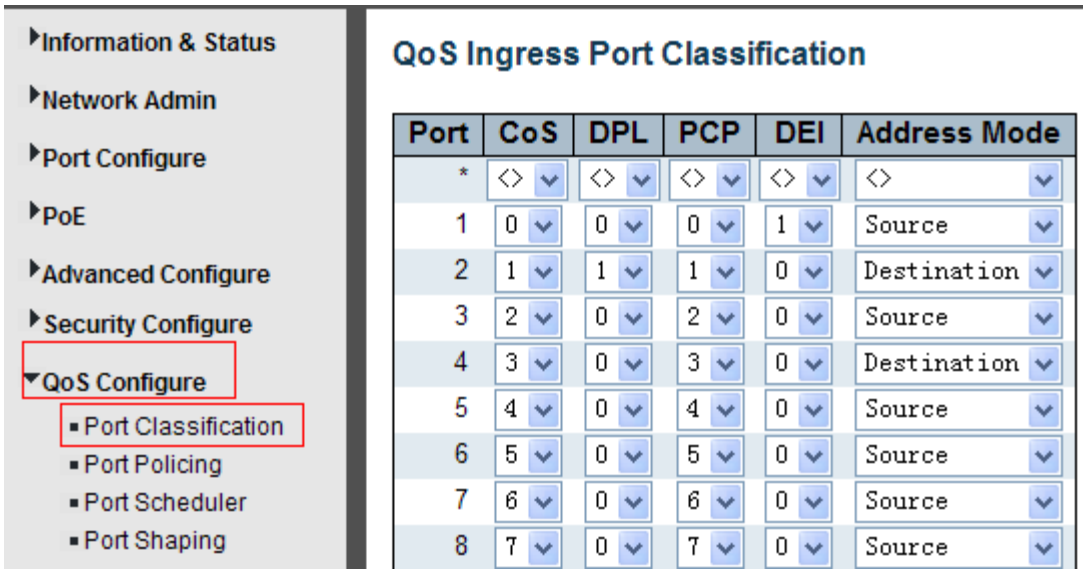


Figure 6-1 Port ClassificationConfiguration Screen

Configuration object and description is:

Object	Description
CoS	Controls the default class of service, ranging from 0 (lowest) to 7 (highest).

	All frames are classified to a CoS. There is a one to one mapping between CoS, queue and priority. A CoS of 0 (zero) has the lowest priority The classified CoS can be overruled by a QCL entry. Note: If the default CoS has been dynamically changed, then the actual default CoS is shown in parentheses after the configured default CoS.
DPL	Controls the default drop precedence level. All frames are classified to a drop precedence level. The classified DPL can be overruled by a QCL entry.
PCP	Controls the default PCP value. All frames are classified to a PCP value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the PCP value in the tag. Otherwise the frame is classified to the default PCP value.
DEI	Controls the default DEI value. All frames are classified to a DEI value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the DEI value in the tag. Otherwise the frame is classified to the default DEI value.
Address Mode	The IP/MAC address mode specifying whether the QCL classification must be based on source (SMAC/SIP) or destination (DMAC/DIP) addresses on this port. The allowed values are: Source: Enable SMAC/SIP matching. Destination: Enable DMAC/DIP matching.

Click "Save" to store and active settings.

6.2 Port Policing

After Click "QoS Configure">"Port Policing," the following screen will appear.

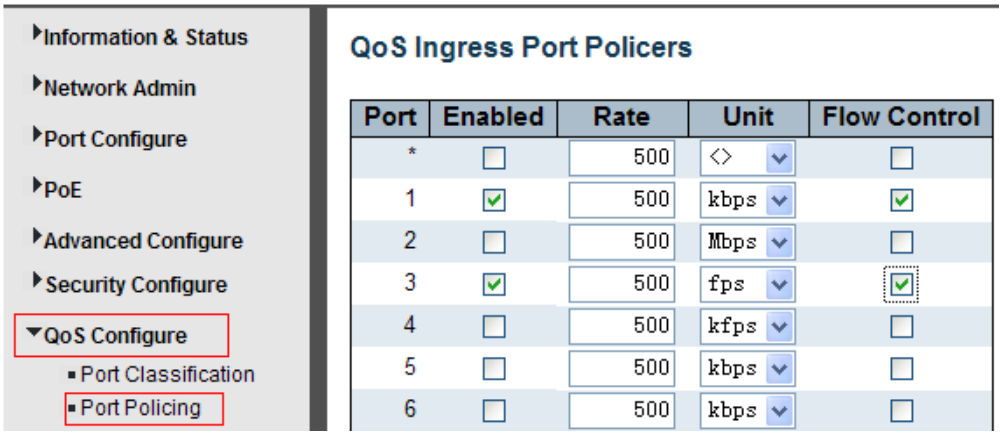


Figure 6-2Port PolicingConfiguration Screen

Configuration object and description is:

Object	Description
Enabled	Check the box to enable Port Policing.

Rate	Controls the rate for the policer. The default value is 500. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".
Unit	Controls the unit of measure for the policer rate as kbps, Mbps, fps or kfps . The default value is "kbps".
Flow Control	If flow control is enabled and the port is in flow control mode, then pause frames are sent instead of discarding frames.

Click "Save" to store and active settings.

6.3 Storm Control Configuration

After Click "QoS Configure">"Storm Control," the following screen will appear.

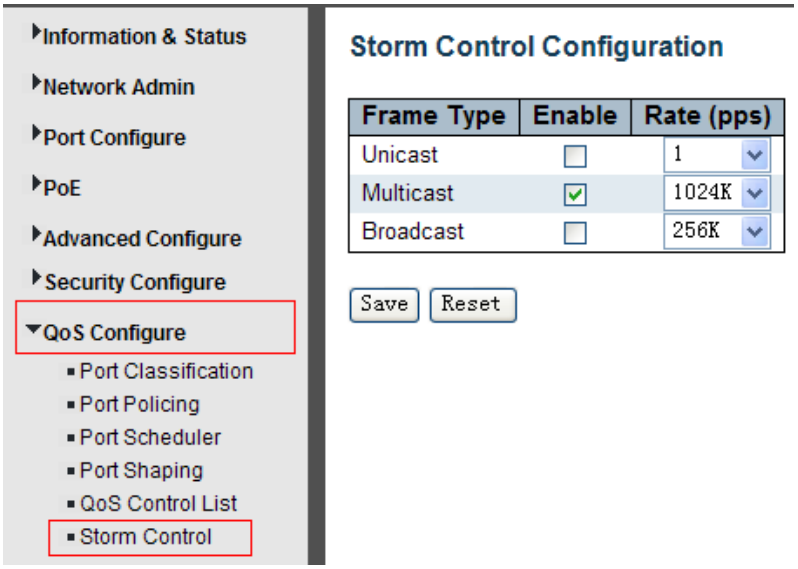


Figure 6-3Port PolicingConfiguration Screen

Configuration object and description are:

Object	Description
Frame Type	This switch supports 3 kinds of Frame Type: Unicast, Unknown Multicast, Broadcast.
Enable	Check the box to enable Storm Control.
Rate(pps)	The rate unit is packets per second (pps). Valid values are:1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1K, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K or 1024K..

Click "Save" to store and active settings.

7.Security Configure

7.1 Password

To change the system login password of the switch, please click "Security Configure">"Password."

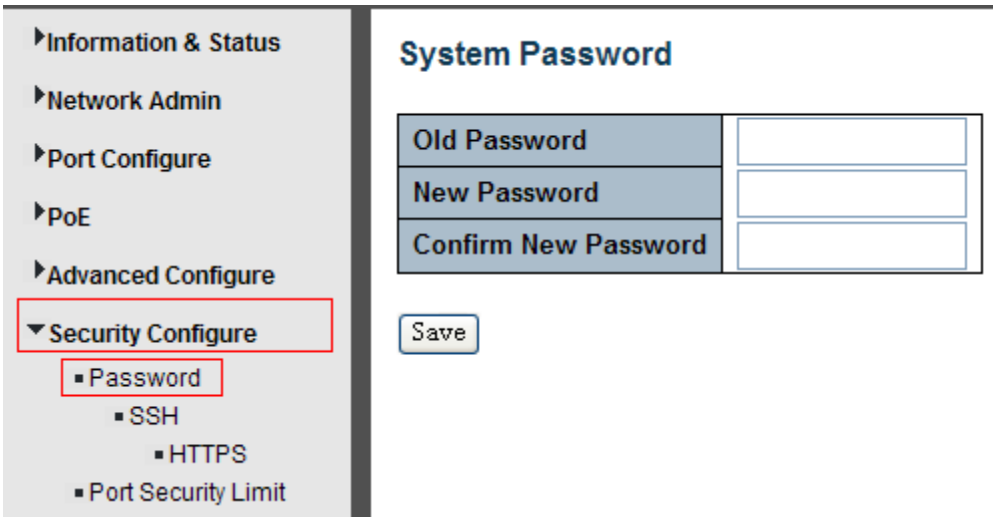


Figure 7-1 System Password Configuration Screen

Click "Save" to store and active settings.

7.2 802.1X

In the 802.1X-world, the user is called the supplicant, the switch is the authenticator, and the RADIUS server is the authentication server. The switch acts as the man-in-the-middle, forwarding requests, and responses between the supplicant and the authentication server. Frames sent between the supplicant and the switches are special 802.1X frames, known as EAPOL (EAP over LANs) frames. EAPOL frames encapsulate EAP PDUs (RFC3748). Frames sent between the switches and the RADIUS server are RADIUS packets.

RADIUS packets also encapsulate EAP PDUs together with other attributes like the switch's IP address, name, and the supplicant's port number on the switch. EAP is very flexible, in that it allows for different authentication methods, like MD5-Challenge, PEAP, and TLS. The important thing is that the authenticator (the switch) doesn't need to know which authentication method the supplicant and the authentication server are using, or how many information exchange frames are needed for a particular method. The switch simply encapsulates the EAP part of the frame into the relevant type (EAPOL or RADIUS) and forwards it.

When authentication is complete, the RADIUS server sends a special packet containing a success or failure indication. Besides forwarding this decision to the supplicant, the switch uses it to open up or block traffic on the switch port connected to the supplicant.

The IEEE 802.1X standard defines a client-server-based access control and authentication protocol that restricts unauthorized clients from connecting to a LAN through publicly accessible ports. The authentication server authenticates each client connected to a switch port before making available any services offered by the switch or the LAN.

Until the client is authenticated, 802.1X access control allows only Extensible Authentication Protocol over LAN (EAPOL) traffic through the port to which the client is connected. After authentication is successful, regular traffic can pass through the port.

This switch supports 802.1X port-based authentication. In this page, user can configure 802.1X. After click "Security Configure">"802.1X", followed screen will appear.

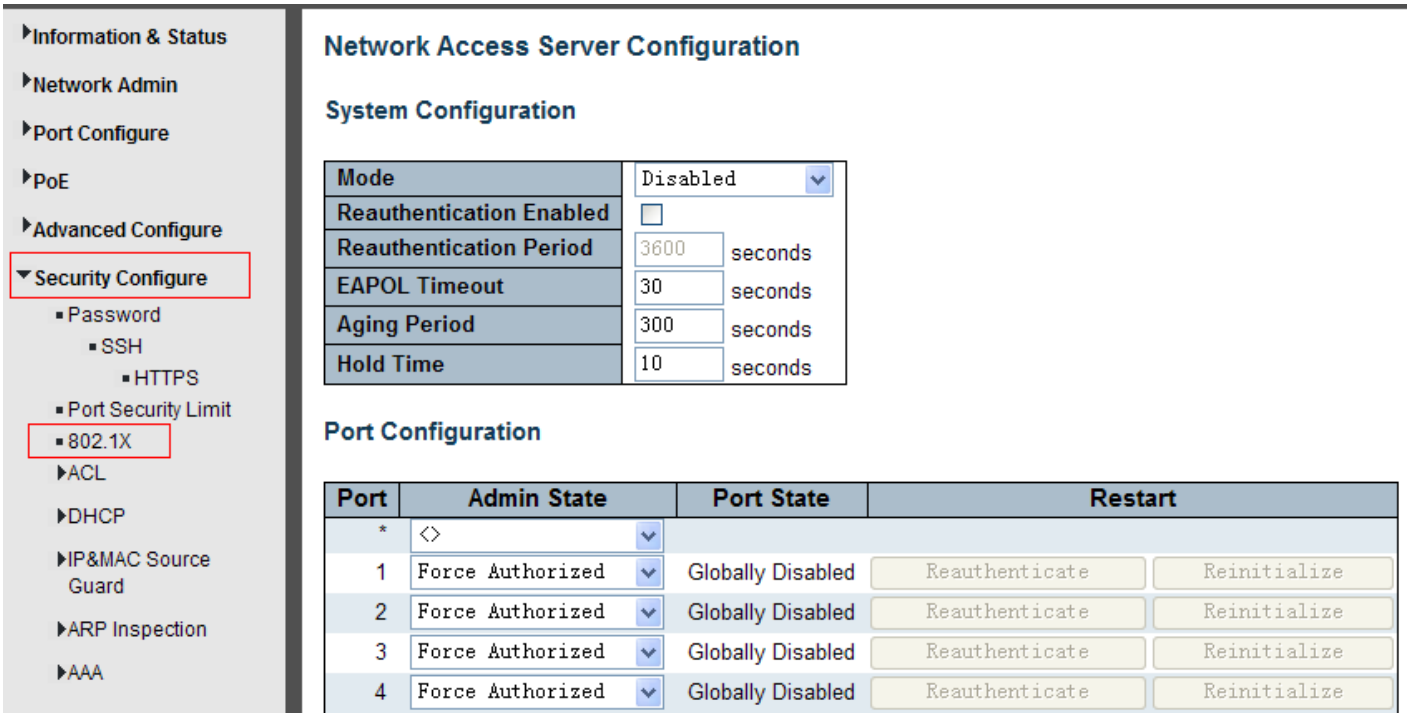


Figure 7-2 802.1XConfiguration Screen

Configuration object and description is:

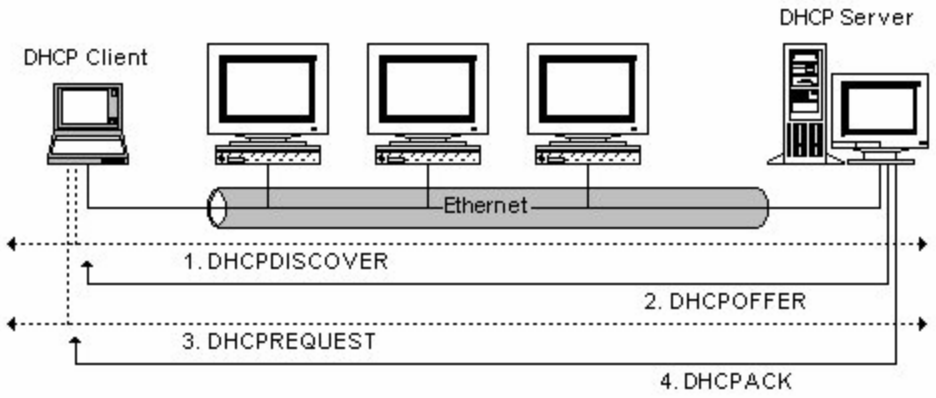
Object	Description
System Configuration	Here, user can enable or disable 802.1X or Re-authentication, as well as set Re-authentication Period / EAPOL Timeout / Aging Period / Hold Time
Port Configuration	Click drop-down menu to select a Admin State. Available options: Force Authorized, Force Unauthorized, 802.1X, Mac-based Auth.

Click "Save" to store and active settings.

7.3 DHCP Snooping

7.3.1 DHCP Overview

The DHCP protocol is widely used to dynamically allocate reusable network resources, such as IP address. A typical process of DHCP to obtain IP is as follows:



DHCP Client sent DHCP DISCOVER message to DHCP Server, if the Client did not receive a response from the server within a period of Time, it will resend the DHCP DISCOVER message.
After received DHCP DISCOVER message, DHCP Server will assign sources (IP address, for example) to client, and then send the DHCP OFFER message to DHCP Client.

After receiving the DHCP OFFER message, DHCP Client sends DHCP REQUEST to ask for the server lease, and notify the other servers that it has accepted this server to assign addresses.

After received DHCP REQUEST, the server will verify whether the resource can be allocated. If OK, it will send DHCP ACK message; If not OK, it will send DHCP NAK message. After receiving the DHCP ACK message, start using the source which server assigned. If received DHCP NAK, DHCP Client will resend the DHCP DISCOVER message.

7.3.2 About DHCP Snooping

The addresses assigned to DHCP clients on insecure ports can be carefully controlled using the dynamic bindings registered with DHCP Snooping. DHCP snooping allows a switch to protect a network from rogue DHCP servers or other devices that send port-related information to a DHCP server. This information can be useful in tracking an IP address back to a physical port.

Command Usage

- Network traffic may be disrupted when malicious DHCP messages are received from an outside source. DHCP snooping is used to filter DHCP messages received on a non-secure interface from outside the network or firewall When DHCP snooping is enabled globally and enabled on a VLAN interface, DHCP messages received on an untrusted interface from a device not listed in the DHCP snooping table will be dropped
- Table entries are only learned for trusted interfaces. An entry is added or removed dynamically to the DHCP snooping table when a client receives or releases an IP address from a DHCP server. Each entry includes a MAC address, IP address, lease time, VLAN identifier, and port identifier.
- When DHCP snooping is enabled, DHCP messages entering an untrusted interface are filtered based upon dynamic entries learned via DHCP snooping.
- If a DHCP packet from a client passes the filtering criteria, it will only be forwarded to trusted ports in the same VLAN

- If a DHCP packet is from the server is received on a trusted port, it will be forwarded to both trusted and untrusted ports in the same VLAN.
- If the DHCP snooping is globally disabled, all dynamic bindings are removed from the binding table.

7.3.3DHCP Snooping Configure

After click "Security Configure">"DHCP ">"Snooping Setting", following screen will appear.

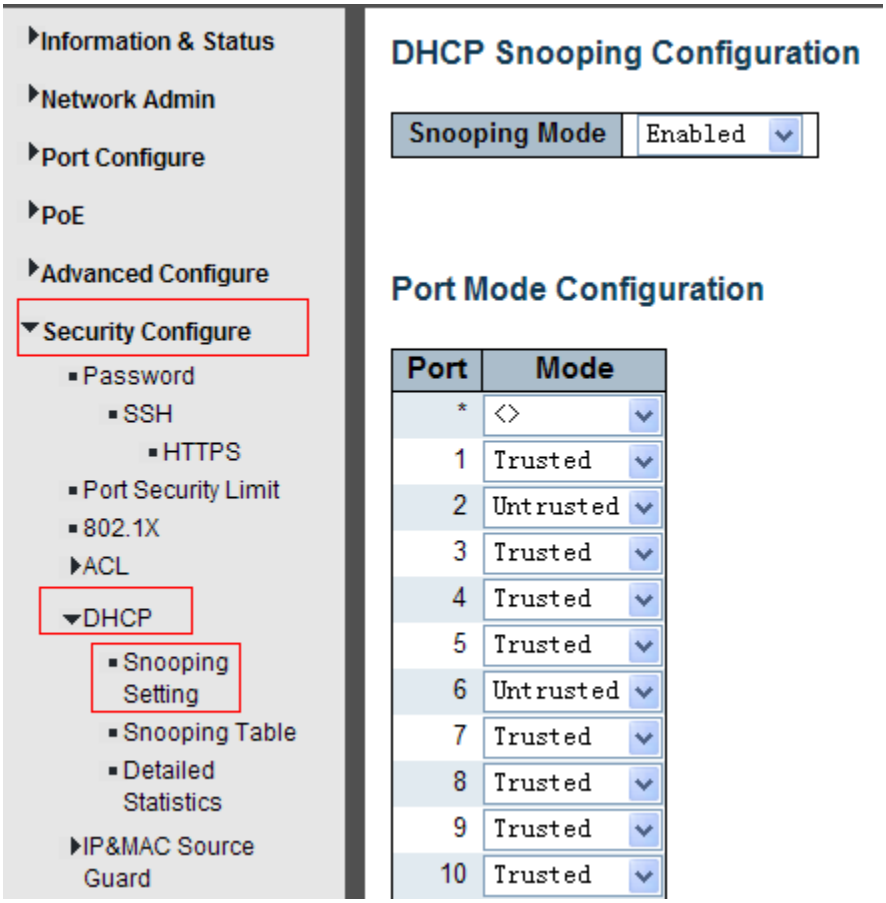


Figure 7-3DHCP Snooping Configuration Screen

Configuration object and description is:

Object	Description
DHCP Snooping Mode	Click drop-down menu to enable or disable DHCP Snooping
Port Mode	Indicates the DHCP snooping port mode. Possible port modes are: Trusted: Configures the port as trusted source of the DHCP messages. Untrusted: Configures the port as untrusted source of the DHCP messages.

Click "Save" to store and active settings.

7.4 IP&MAC Source Guard

IP&MAC Source Guard is a security feature used to restrict IP traffic on DHCP snooping untrusted ports by filtering traffic based on DHCP Snooping Table or manually configured IP Source Bindings. It helps prevent IP spoofing attacks when a host tries to spoof and use the IP address of another host.

7.4.1 Port Configuration

On this page, users can make IP&MAC Source Guard Port Configuration. After click "Security Configure">"IP & MAC Source Guard">"Configuration", followed screen will appear.

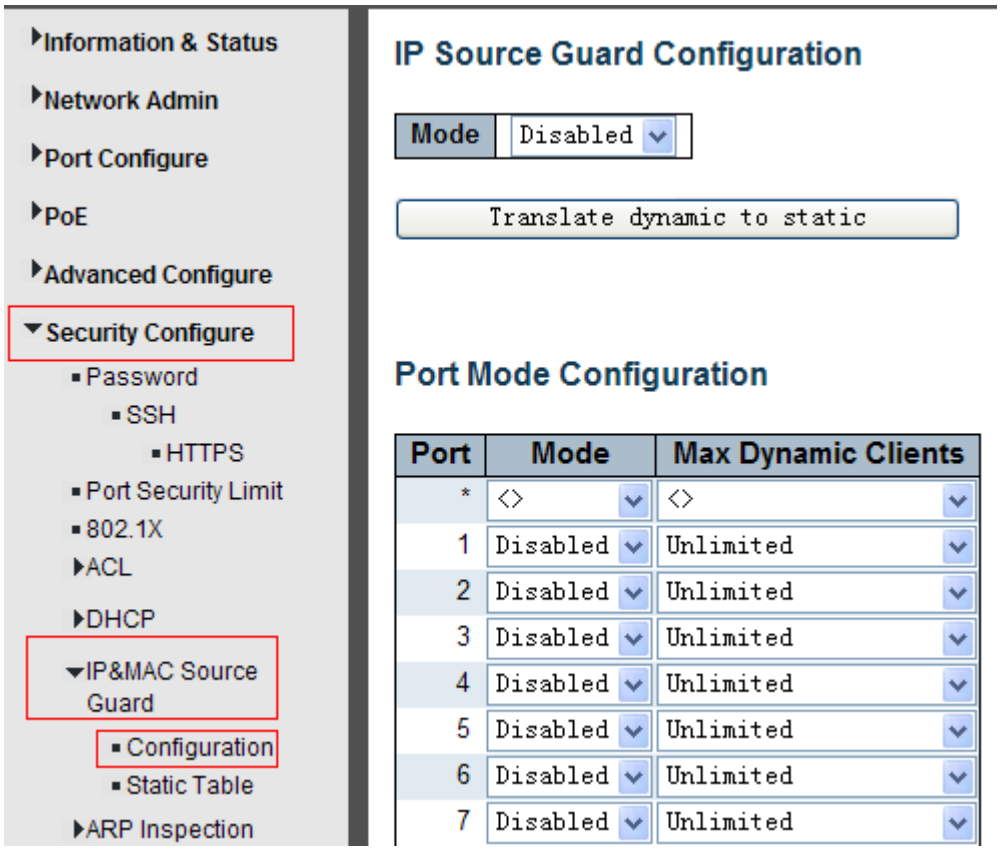


Figure 7-4 IP&MAC Guard- Port Configuration Screen

Configuration object and description is:

Object	Description
Global Mode	Click drop-down menu to enable or disable Global IP&MAC Source Guard function
Port Mode	Click drop-down menu to enable or disable the IP&MAC Source Guard function for corresponding port.
Max Dynamic Clients	Click drop-down menu to select Max Dynamic Clients. Available options: Unlimited, 0, 1, 2.

Click "Save" to store and active settings.

7.4.2 Static Table

On this page, the user can manually set Static Table ofIP&MAC Guard to fulfill the controlling function to port.After click "Security Configure">"IP&MAC Source Guard">"Static Table", followed screen will appear.

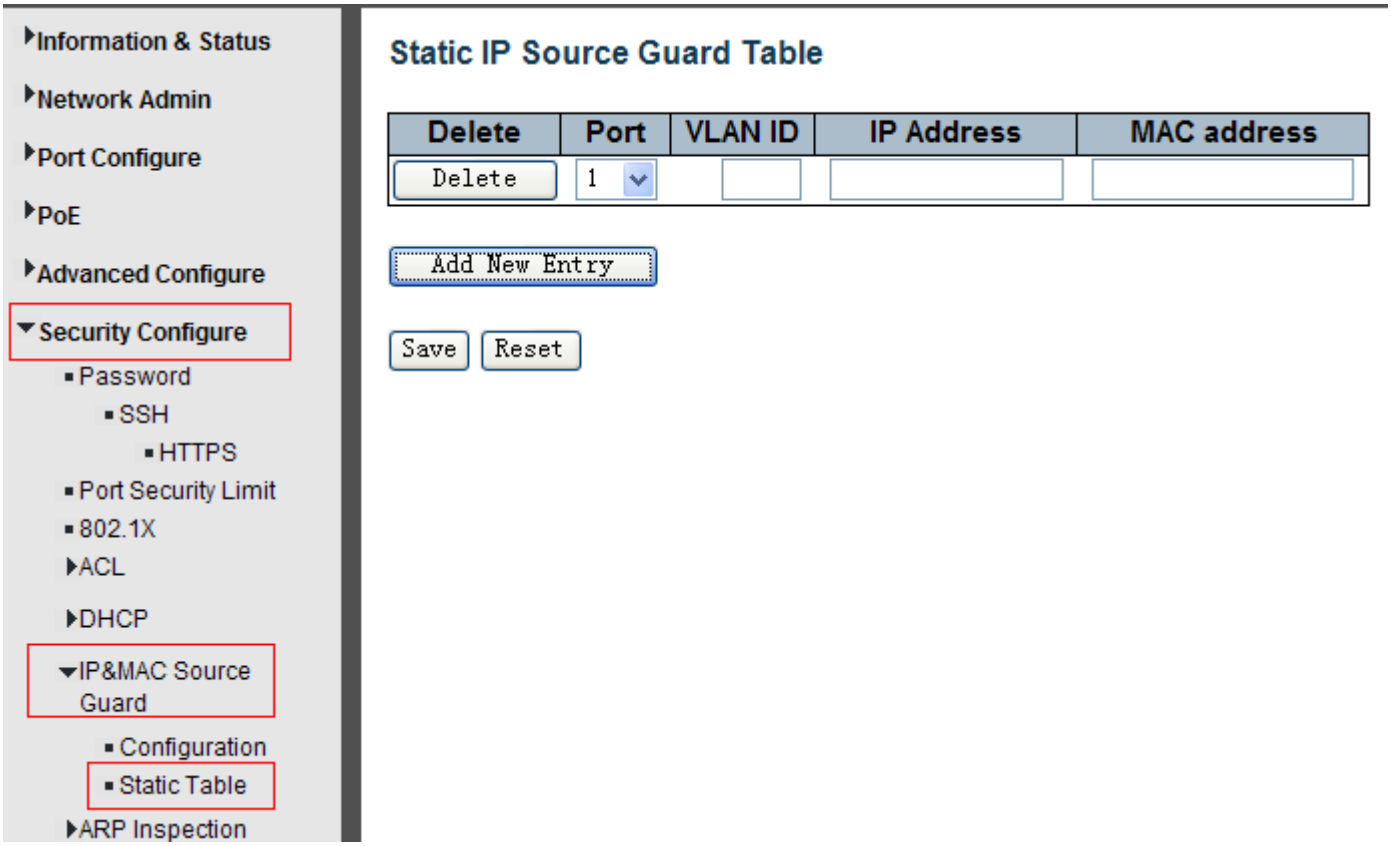


Figure 7-5 Static TableConfiguration Screen

Configuration object and description is:

Object	Description
Port	Click drop-down menu to select which port should be fixed.
VLAN	Type VLAN ID that should be fixed to
IP Address	Type IP Address that should be fixed to
MAC Address	Type Mac Address that should be fixed to

Click "Add New Entry" button to create a new record.

Click "Save" to store and active settings.

7.5 ARP Inspection

Dynamic ARP Inspection (DAI) is a security feature. Several types of attacks can be launched against a host or devices connected to Layer 2 networks by "poisoning" the ARP caches. This feature is used to block such attacks. Only valid ARP requests and responses can go through DUT. A Dynamic ARP prevents the untrust ARP packets based on the DHCP Snooping database. This page provides an ARP Inspection related configuration.

7.5.1 Port Configuration

User can make port configuration in this page. After click "Security Configure">"ARP Inspection">"Port Configuration", followed screen will appear.

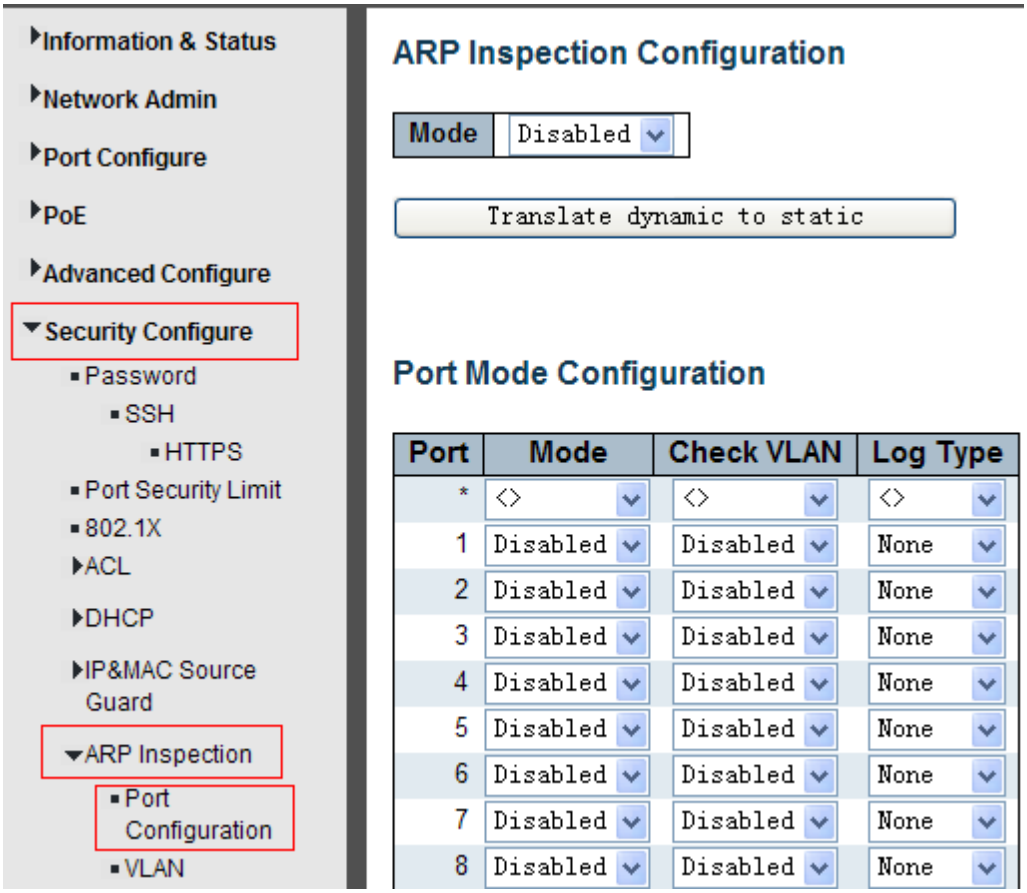


Figure 7-6 ARP Inspection Port Configuration Screen

Configuration object and description is:

Object	Description
Global Mode	Click drop-down menu toenable or disable Global ARP Inspection
Port Mode	Click drop-down menu toenable or disable port-based ARP Inspection
Check VLAN	If you want to inspect the VLAN configuration, you have to enable the setting of "Check VLAN". The default setting of "Check VLAN" is disabled. When the setting of "Check VLAN" is disabled, the log type of ARP Inspection will refer to the port setting. And the setting of "Check VLAN" is enabled, the log type of ARP Inspection will refer to the VLAN setting. Possible setting of "Check VLAN" are:

	Enabled: Enable check VLAN operation. Disabled: Disable check VLAN operation.
Log Type	Only the Global Mode and Port Mode on a given port are enabled, and the setting of "Check VLAN" is disabled, the log type of ARP Inspection will refer to the port setting. There are four log types and possible types: None: Log nothing. Deny: Log denied entries. Permit: Log permitted entries. ALL: Log all entries.

Click "Save" to store and active settings.

7.5.2 VLAN Configuration

After click "Security Configure">"ARP Inspection">"VLANConfiguration," the following screen will appear.

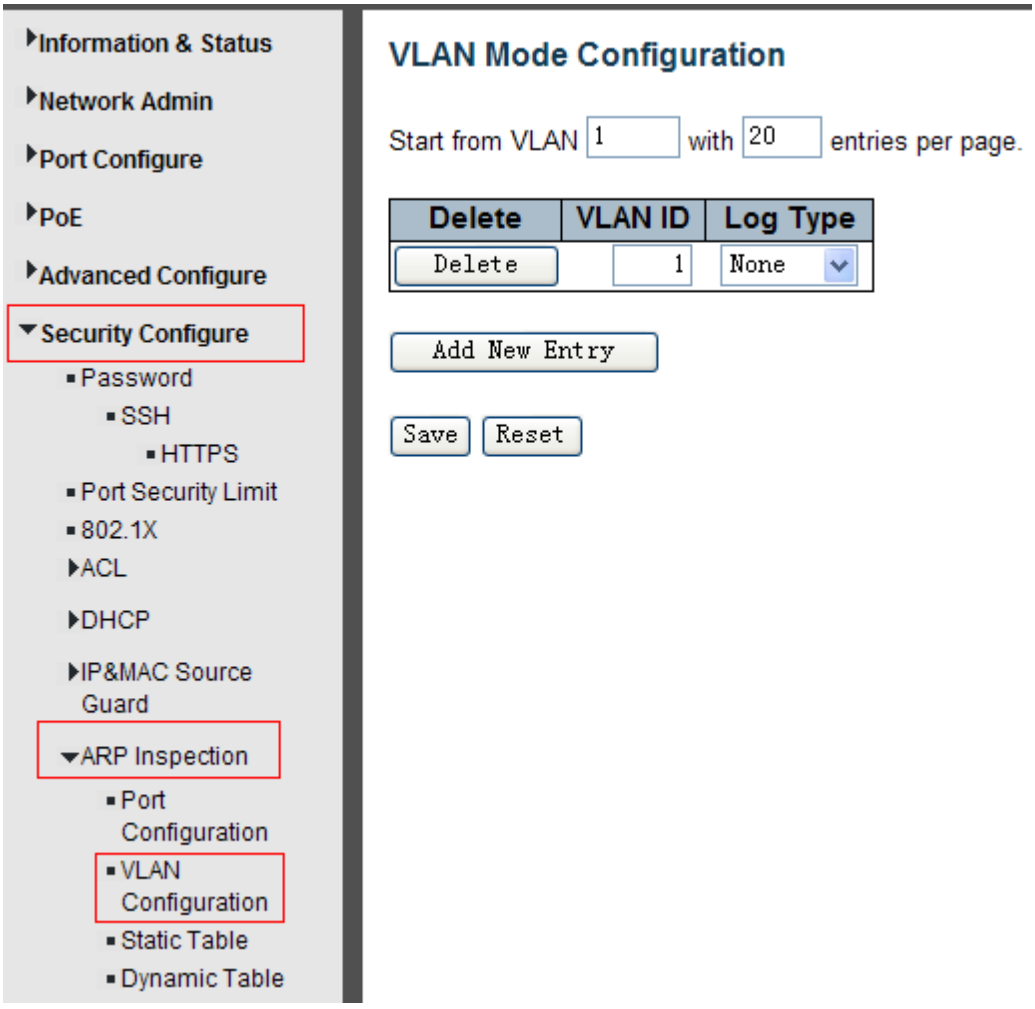


Figure 7-8 ARP Inspection VLANConfiguration Screen

Configuration object and description is:

Object	Description
VLAN ID	Indicates the ID of this particular VLAN

Log Type	Click drop-down menu to enable or disable port-based ARP Inspection. Specify ARP Inspection is enabled on which VLANs. First, you have to enable the port setting on Port mode configuration web page. Only when both Global Mode and Port Mode on a given port are enabled, ARP Inspection is enabled on this given port. Second, you can specify which VLAN will be inspected on VLAN mode configuration web page. The log type also can be configured on per VLAN setting. Possible types are: None: Log nothing. Deny: Log denied entries. Permit: Log permitted entries. ALL: Log all entries.

Click the "Add New Entry" button to create a new record of VLAN configuration. Click "Save" to store and active settings.

7.5.3 Static Table

Users can manually configure ARP InspectionStatic Tableto control port. After click "Security Configure">"ARP Inspection">"Static Table," the following screen will appear.

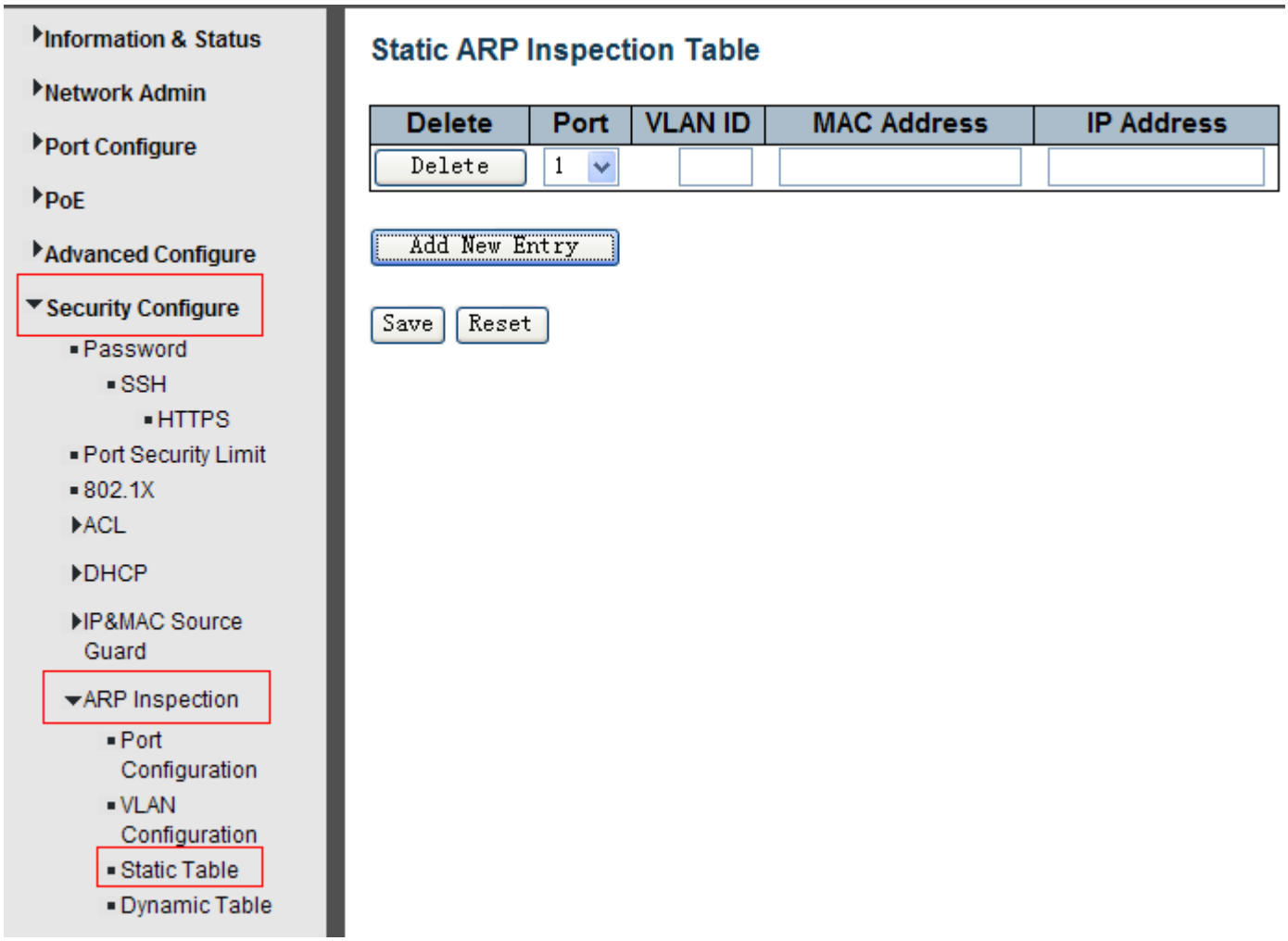


Figure 7-9Static TableConfiguration Screen

Configuration object and description is:

Object	Description
Port	Click drop-down menu to select which port should be fixed.
VLAN	Type VLAN ID that should be fixed to
IP Address	Type IP Address that should be fixed to
MAC Address	Type Mac Address that should be fixed to

Click "Add New Entry" button to create a new record.Click "Save" to store and active settings.

7.6 ACL

ACL is an acronym for **Access Control List**. It is the list table of ACEs, containing access control entries that specify individual users or groups permitted or denied to specific traffic objects, such as a process or a program. Each accessible traffic object contains an identifier to its ACL. The privileges determine whether there are particular traffic object access rights.

ACL implementations can be quite complex, for example, when the ACEs are prioritized for various situation. In networking, the ACL refers to a list of service ports or network services that are available on a host or server, each with a list of hosts or servers permitted or denied to use the service. ACL can generally be configured to control inbound traffic, and in this context, they are similar to firewalls.

7.6.1 ACL Ports Configure

After click "Security Configure">"ACL">"Ports", followed screen will appear.

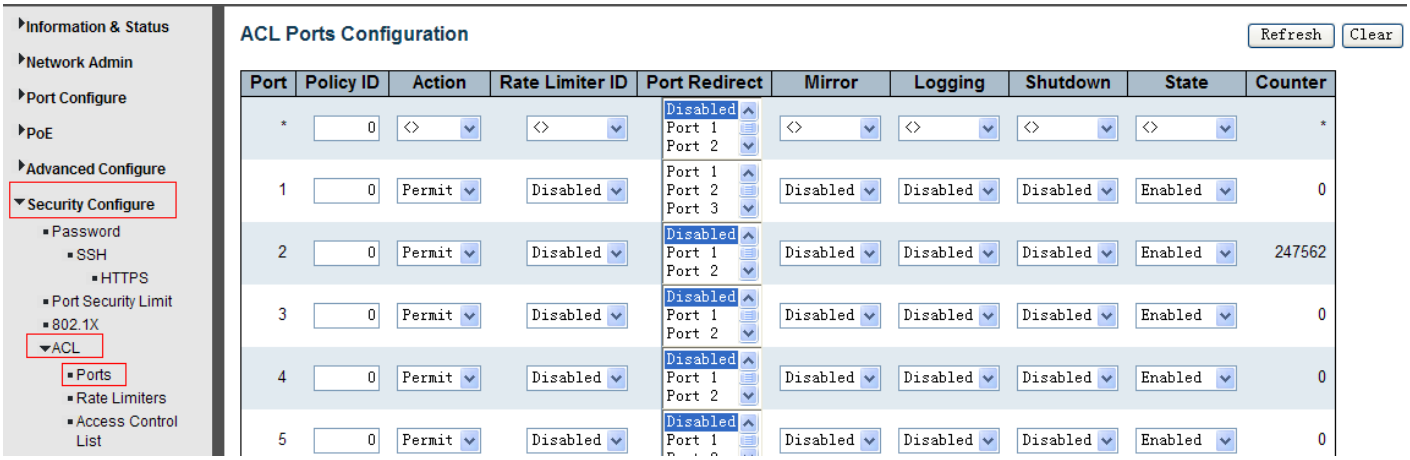


Figure 7-10 ACL Ports Configuration Screen

Configuration object and description is:

Object	Description
Action	There are 2 available options: Permit: that specific port allows data going through. Deny: that specific port forbid data going through.

Rate LimiterID	Port's fixed Rate Limiter ID, please go to Rate Limiter Configuration for more details.
Port Redirect	Select which port frames are redirected on. The allowed values are Disabled or a specific port number and it can't be set when action is permitted. The default value is "Disabled".
Mirror	Specify the mirror operation of this port. The allowed values are: Enabled: Frames received on the port are mirrored. Disabled: Frames received on the port are not mirrored. The default value is "Disabled".
Logging	Enabled or Disabled Log
Shut Down	Specify the port shut down operation of this port. The allowed values are: Enabled: If a frame is received on the port, the port will be disabled. Disabled: Port shut down is disabled. The default value is "Disabled". Note: The shutdown feature only works when the packet length is less than 1518(without VLAN tags).
State	Specify the port state of this port. The allowed values are: Enabled: To reopen ports by changing the volatile port configuration of the ACL user module. Disabled: To close ports by changing the volatile port configuration of the ACL user module. The default value is "Enabled".
Counter	Counts the number of frames that match this rule.

Click "Save" to store and active settings.

7.6.2Rate Limiter Configuration

Users can make ACL Rate limiter configuration on this page. After click "Security Configure">"ACL">"Rate Limiter," the following screen will appear.

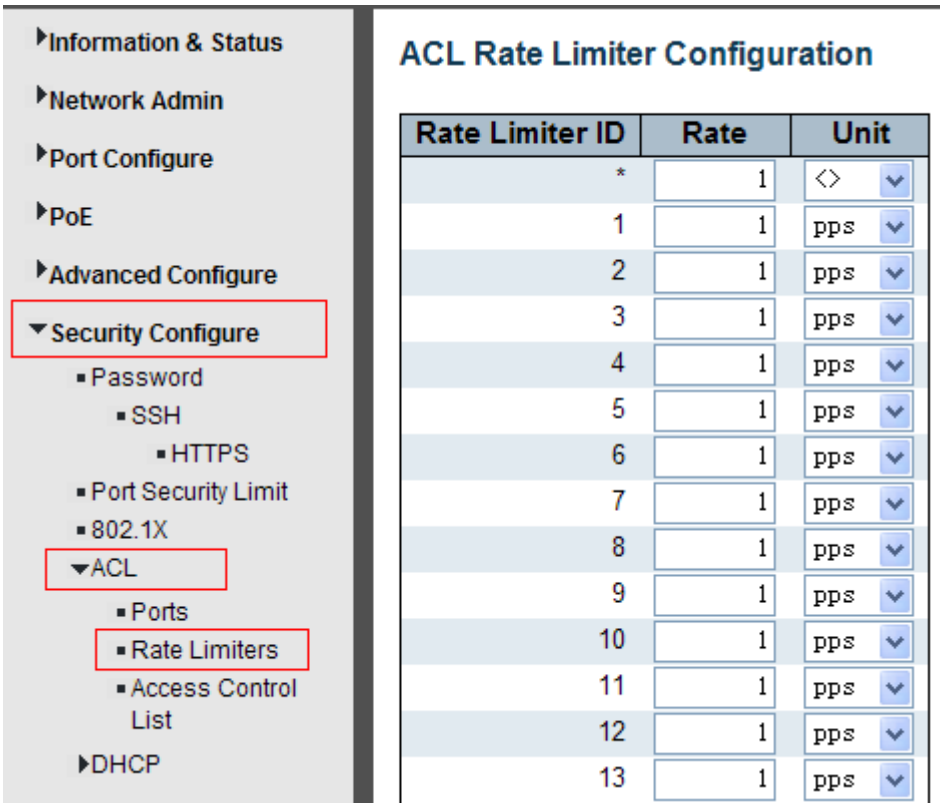


Figure 7-11 ACL Rate Limiters Configuration Screen

Click "Save" to store and active settings.

7.6.3 Access Control List Configuration

Users can make Access Control List Configuration on this page. After click "Security Configure">"ACL">"Access Control List," the following screen will appear.

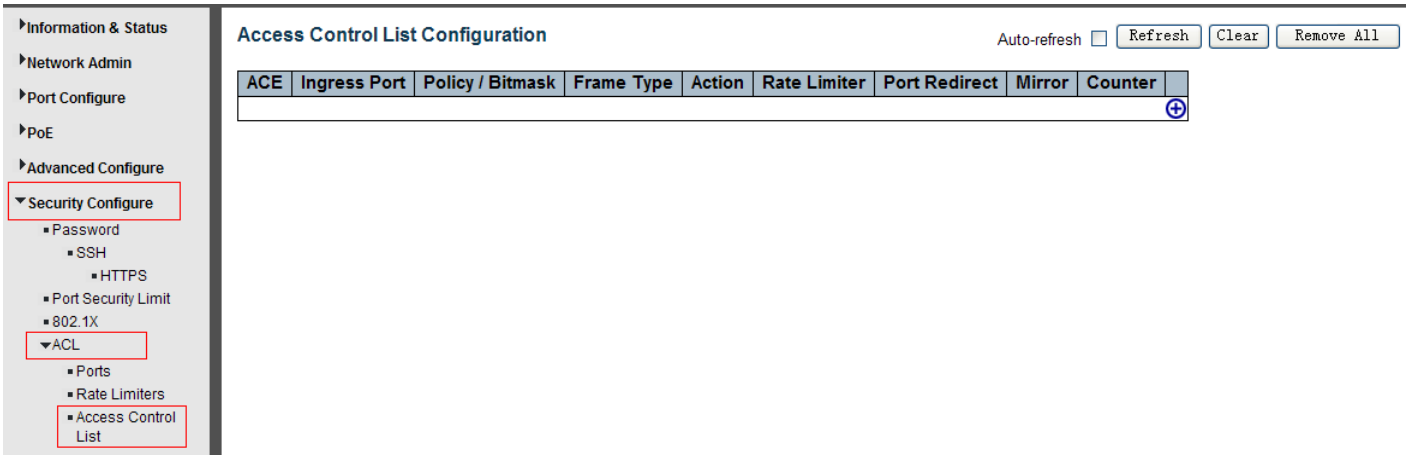


Figure 7-12 Access Control ListConfiguration Screen

Click ⊕ button, to go to Access Control List and edit it.

8.Diagnostics

8.1 Ping Test

Ping is a little program that can issue ICMP Echo packets to the IP address you defined. The destination node will respond to those packets sent from thbe switch. So the Ping test is to troubleshoot IP connectivity issues.

After click "Diagnostics ">"Ping", followed screen appear.

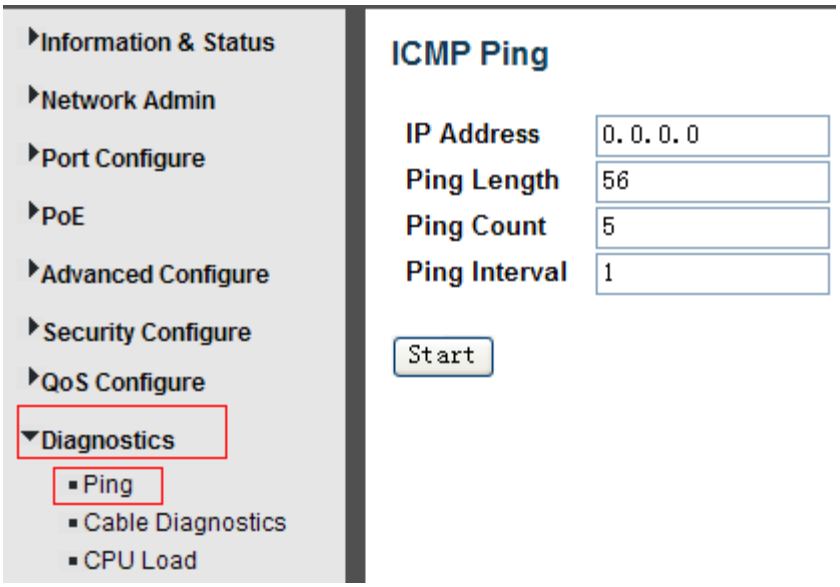


Figure 8-1 Ping Test Screen

Configuration object and description is:

Object	Description
IP Address	The destination IP Address that needed to Ping
Ping Length	Input a number between 1 and 1452. Default: 56
Ping Count	The times for inputting Ping IPv4 address or IPv6 address (Number of echo requests to send). User can input a number between 1 and 60.
Ping Interval	Interval time for Ping (Send interval for each ICMP packet)

Click "Start" button to start Ping testing.

8.2 Cable Diagnostics

The Cable Diagnostics performs tests on 10/100/1000BASE-T copper cables. These functions can identify the cable length and operating conditions and isolate a variety of common faults that can occur on the Cat5 twisted-pair cabling.

After click "Diagnostics ">"Cable Diagnostics", followed screen will appear.

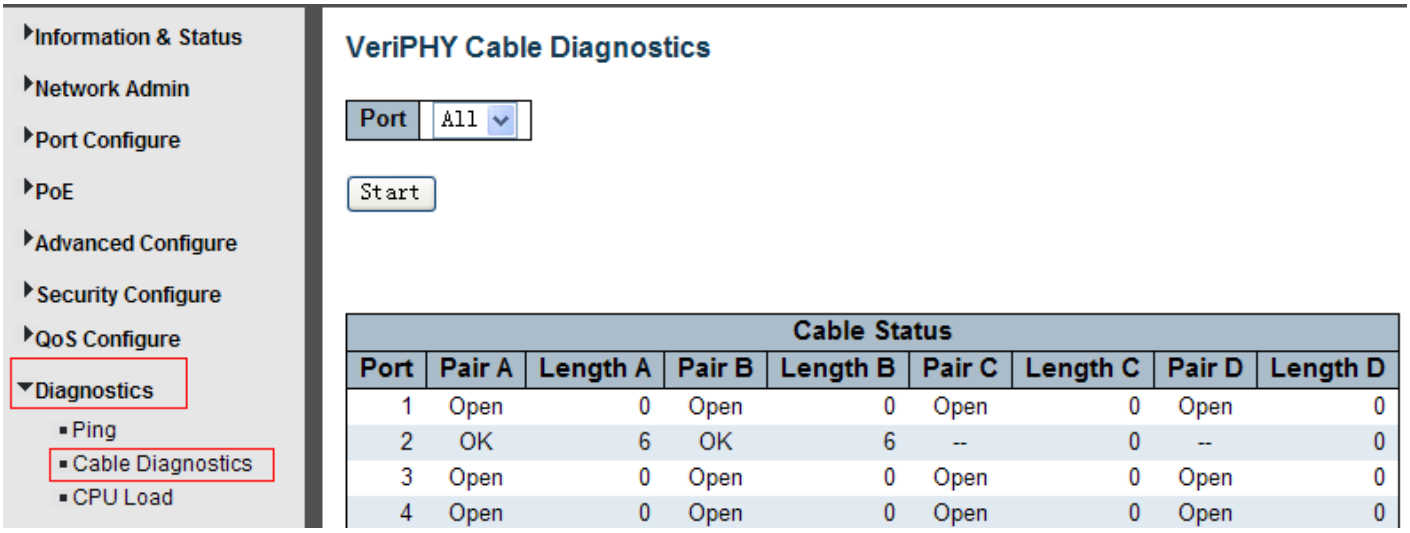


Figure 8-2 Cable Diagnostics Screen

Click "Start" button to start"Cable Diagnostics" testing.

8.3 CPU Load

This page shows the percent of CPU load. After click "Diagnostics">"CPU Load", followed screen will appear.

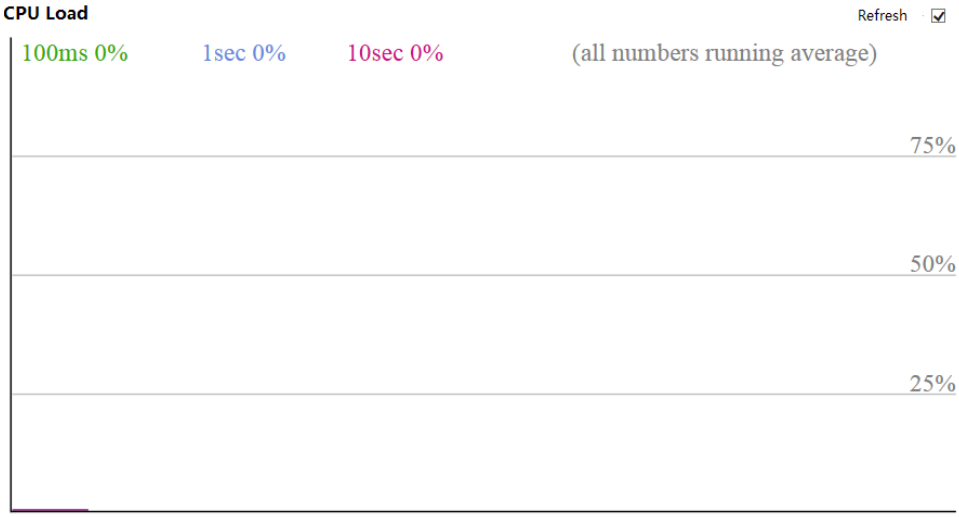
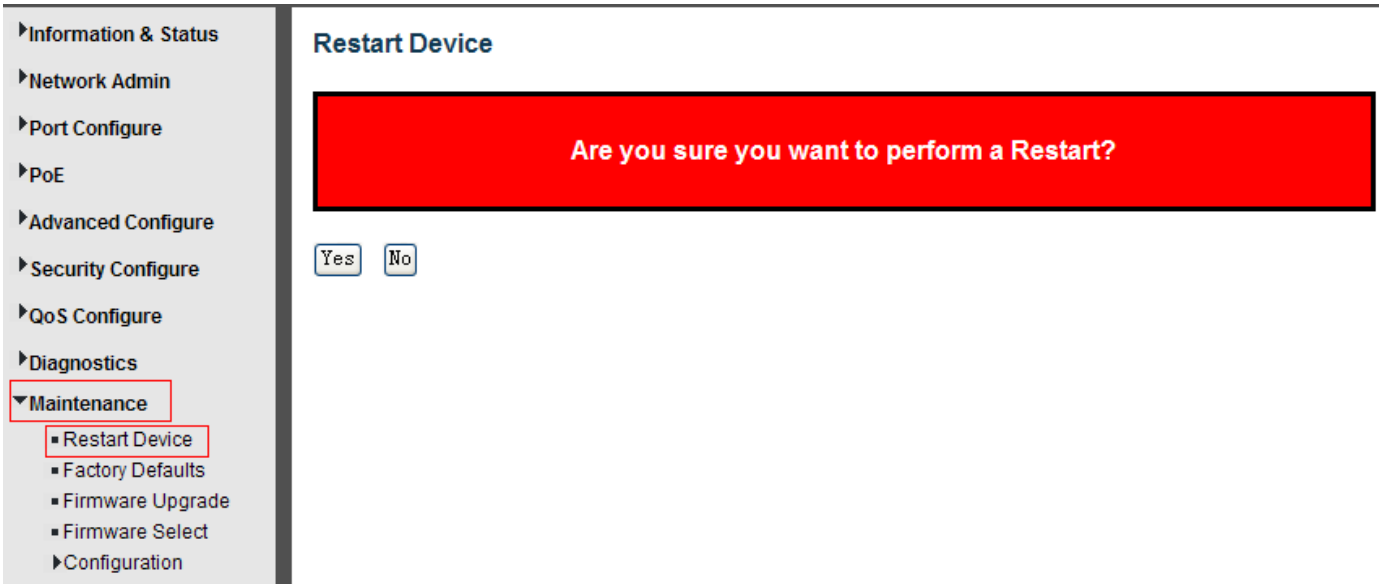


Figure 8-3 CPU Load Screen

9.Maintenance

9.1 Restart Device

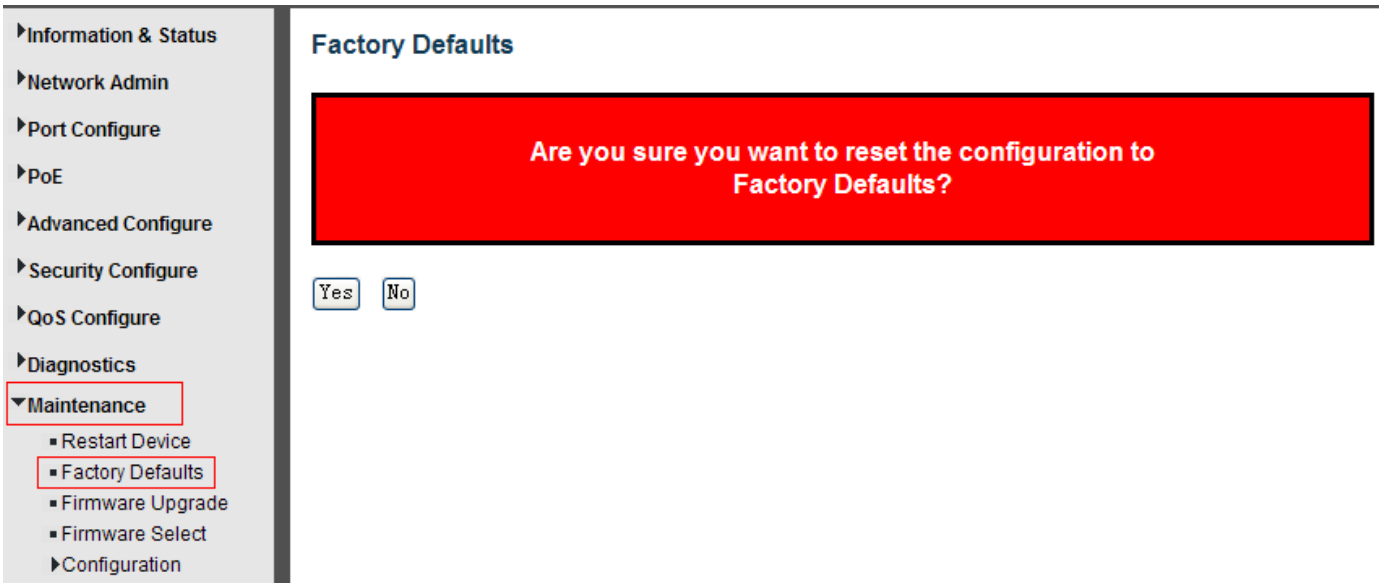
This page is for restarting the switch. After click "Maintenance ">"Restart Device", followed screen will appear.



Please click "Yes" to restart the switch.

9.2 Factory Defaults

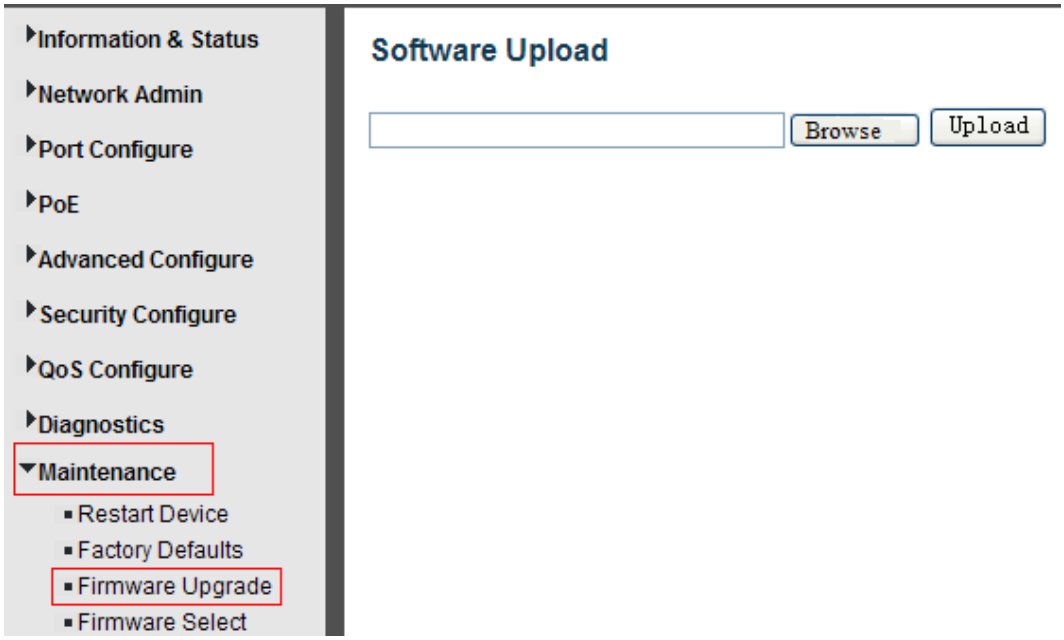
This page is for making all settings to factory defaults. After click "Maintenance ">"Factory Defaults," the following screen will appear.



Please click "Yes" to reset the configuration to Factory Defaults.

9.3 Firmware Upgrade

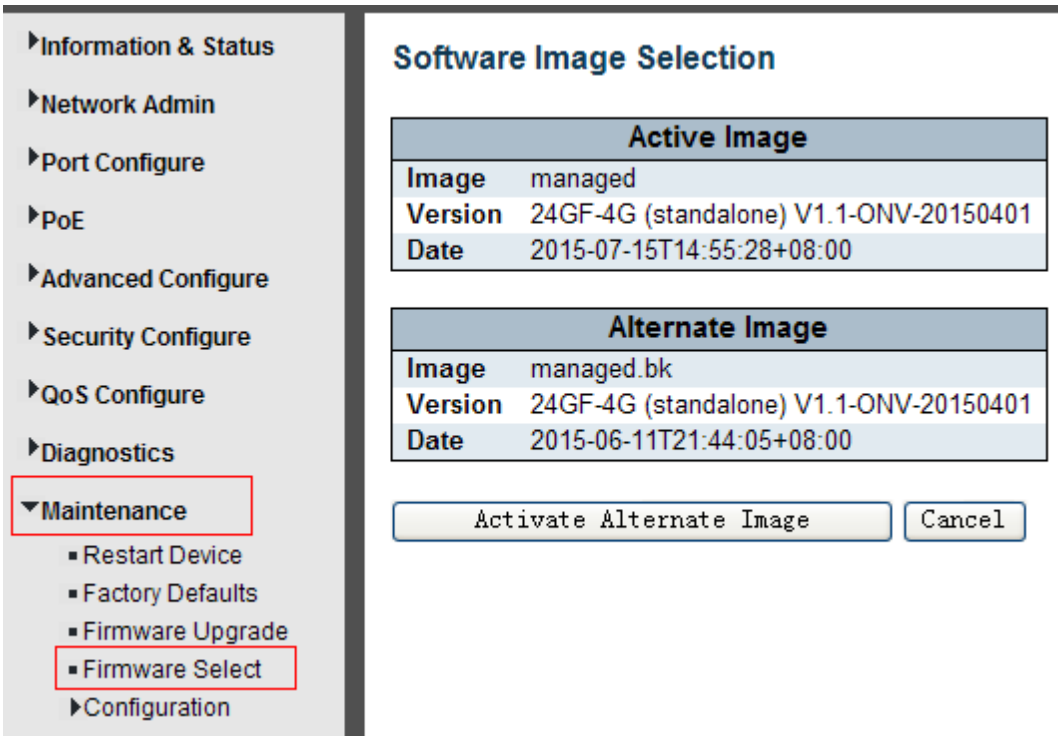
This page is for upgrading system firmware. After click "Maintenance ">"Firmware Upgrade," the following screen will appear.



Please click "Browse" to select the firmware that needed to upgrade. And then click "Upload" to start upgrading.

9.4Firmware Select

This page is for upgrading system firmware. After click "Maintenance " > "Firmware Upgrade,' the following screen will appear.



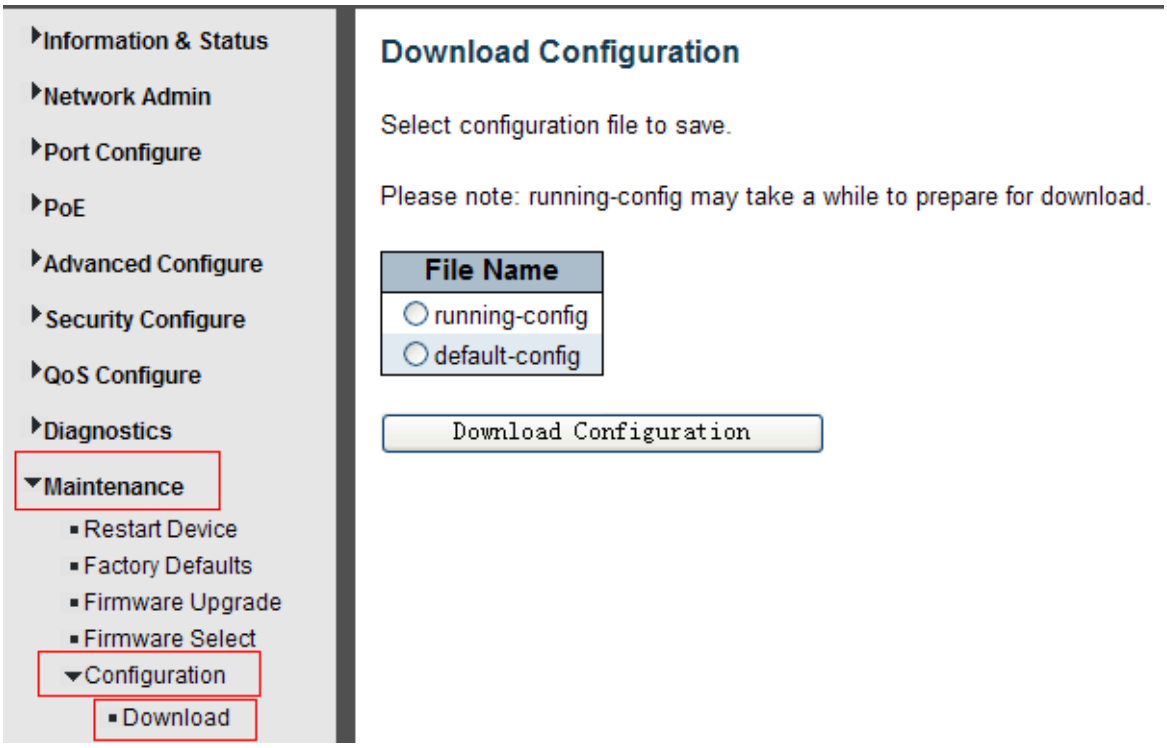
Please click "Activate Alternate Image" to select the firmware.

9.5Firmware Select

On this page, users can download, upload, activated, or delete configuration files.

9.5.1 Download Configuration File

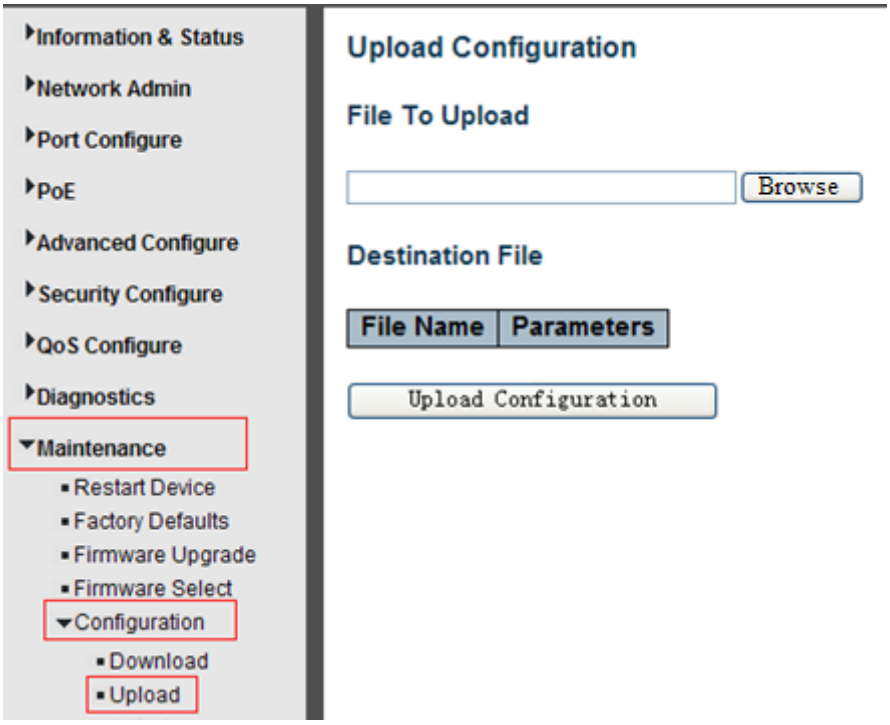
After click "Maintenance ">"Download", followed screen will appear.



Please choose a file and then click "Download Configuration" button to download.

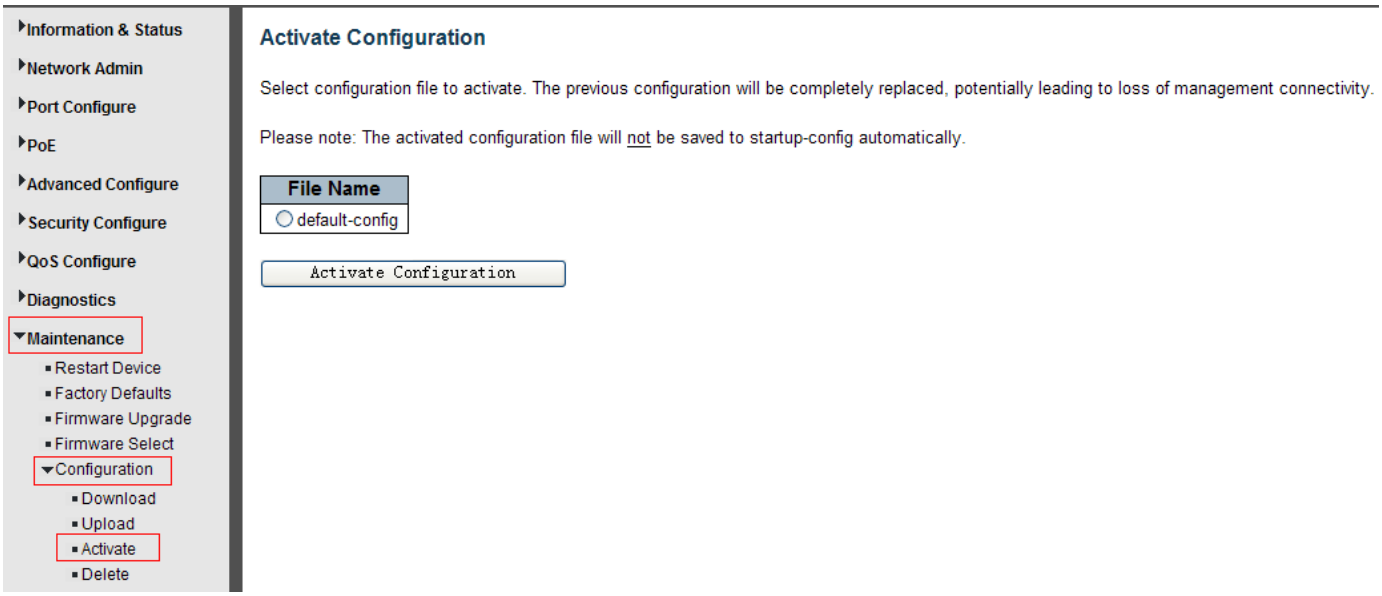
9.5.2 Upload Configuration File

After click "Maintenance ">"Upload", followed screen will appear. Then the user can upload Configuration File.



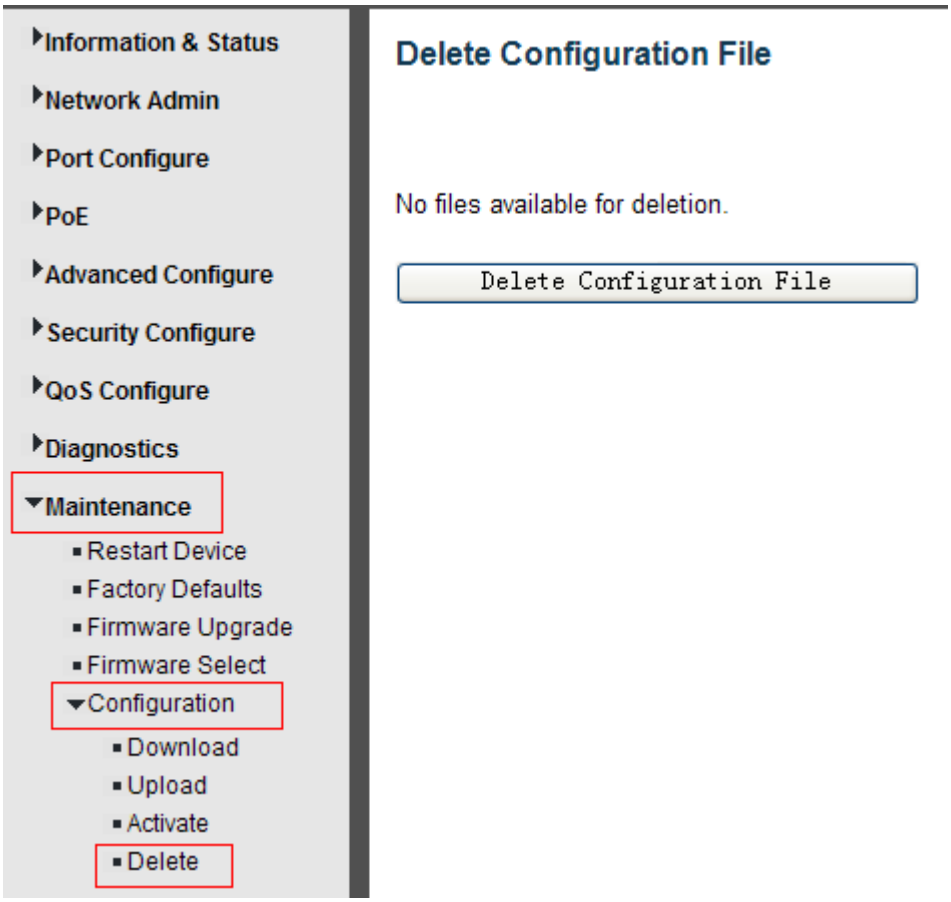
9.5.3 Activate Configuration

After click "Maintenance ">"Activate", followed screen will appear. Then, the user can activate Configuration File.



9.5.4 Delete Configuration File

After click "Maintenance ">"Delete", followed screen will appear. Then, the user can delete Configuration File.



Appendix 1 Term List

	English Name	Description
A	ARP（Address Resolution Protocol）	A protocol that converts an IP address to a physical address
	Auto-Negotiation	To automatically negotiate the working rate and duplex mode on both ends of the switch and other equipment
B	Broadcast Storm	Excessive broadcast frames are sent across the network via a single port.The response to forward information will stack up in the network, consume excessive network resources, or cause network timeouts
	Broadcasting	The forwarding of data to all nodes in the network
C	CoS（Class of Service）	The 802.1 p priority scheme.The CoS provides a way to add a priority label to the packet and divides the message into eight levels.Range of values: 0 ~ 7

D	DHCP（Dynamic Host Configuration Protocol）	The IP address, subnet mask, gateway and other information are distributed dynamically in the network
	DSCP（DiffServe Code Point）	In a six-bit domain encapsulated in the IP header, the message can be divided into 64 levels. Value range: 0 ~ 63
E	Ethernet	Ethernet USES a total line or star topology and supports a transmission rate of 10Mbps.The new version, called fast Ethernet, can be up to 100Mbps.
F	Flow Control	Flow control enables low-speed equipment to communicate with high speed devices.This kind of flow control is the way to suspend the bag through high speed port to match the speed of the high speed port and the speed of the low-speed port
	Frame	A packet containing the header and tail information required for the physical medium layer.
	Full-Duplex	Using the IEEE802.3 x standard, you can simultaneously receive and send data operations in both directions at one Time
H	Half-Duplex	Using the Backpressure standard, you can only receive or send a data operation in one direction at a time
I	IGMP （Internet Group Management Protocol）	The mechanism of establishing and maintaining the relationship between the host and three layer multicast equipment is provided
	IEEE 802.1p	
	IEEE 802.1q	
Q	QoS（Quality of Service）	A technique used to solve problems such as network latency and congestion
T	Trunking	A group of ports is bundled together to form an aggregate group to increase the bandwidth and enhance the reliability of the connection
	ToS（Type of Service）	In an 8-bit domain encapsulated in the IP header, a message representing different priority characteristics is represented
U	UDP（User Datagram Protocol）	An unconnected, unreliable transport layer protocol
	UTP(Unshielded Twisted Pair)	There is no shielding media outside the double strand

Appendix2FAQ

1. Why is it not normal to display a page through a WEB browsing configuration

A: Before accessing the WEB, remove the cache and COOKIES of IE. Otherwise, it may cause abnormal.

2. Forget the Password?

3. A: Forgetting the login password can be used to initialize the password by restoring the factory settings. Press the button at 10s. Initial user name "admin" and password "system".

3. Would it be both workings if configuring by web or CLI?

A: Yes, both ways are working.

4. Why can't increase bandwidth after configuring Trunking？

A: Please check if the information of the Trunking set port is the same, including rate, duplex mode, and VLAN, etc.

5. How to deal with the problem of partial ports of the switch?

A: When some ports are blocked on the switch, it may be the network cable fault, the network card failure or the switch port failure, users can test by following steps:

Test the failure:

1. The connection of the computer and the switch ports remains unchanged and replace other network cables.

2. The network cable and the switch port remains unchanged and change the computer;

3. The network cable and computer remain unchanged and replace the switch ports;

4. If confirmed that is caused by the switch port failure, please contact the supplier for maintenance;

6. What is the order of the port self-adaptive status detection?

A: Port of state testing was conducted in the following order: 1000Mbps full-duplex, 100Mbps full-duplex, 100Mbps half-duplex, 10Mbps full-duplex, 10 Mbps half-duplex. And automatically connect with maximum speed.

----------**The End**----------